



UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE FILOSOFIA E CIÊNCIAS HUMANAS
PROGRAMA DE PÓS-GRADUAÇÃO EM PSICOLOGIA

Paulus Arnoldus Johannes Maria de Wit

Understanding Trauma Through Understanding Cognition
(Comprendendo Trauma Atraves da Compreensão da Cognition)

Florianópolis, SC

2023

Paulus Arnoldus Johannes Maria de Wit

Understanding Trauma Through Understanding Cognition

(Comprendendo Trauma Atraves da Compreensão da Cognição)

Tese submetida ao Programa de Pós-graduação em Psicologia da Universidade Federal de Santa Catarina como requisito parcial a obtenção do título de Doutor em Psicologia na área de concentração Saúde e Desenvolvimento Psicológico.

Orientador: Prof. Dr. Roberto Moraes Cruz

Coorientador: Prof. Dr. Erik W. Baars

Florianópolis, SC

2023

de Wit, Paulus Arnoldus Johannes Maria
Understanding Trauma Through Understanding Cognition /
Paulus Arnoldus Johannes Maria de Wit ; orientador,
Roberto Moraes Cruz, coorientador, Erik Wim Baars, 2023.
315 p.

Tese (doutorado) - Universidade Federal de Santa
Catarina, Centro de Filosofia e Ciências Humanas, Programa
de Pós-Graduação em Psicologia, Florianópolis, 2023.

Inclui referências.

1. Psicologia. 2. Cognição. 3. Fenomenologia Goetheana.
4. Processamento de Trauma. 5. Modelo Teórico de Trauma. I.
Cruz, Roberto Moraes. II. Baars, Erik Wim. III.
Universidade Federal de Santa Catarina. Programa de Pós
Graduação em Psicologia. IV. Título.

Paulus Arnoldus Johannes Maria de Wit

Understanding Trauma Through Understanding Cognition

(Comprendendo Trauma Atraves da Compreensão da Cognition)

O presente trabalho em nível de Doutorado foi avaliado e aprovado, em 27 de março de 2023,
pela banca examinadora composta pelos seguintes membros:

Profa. Chrissie Ferreira de Carvalho, Dra.
Instituição Universidade Federal de Santa Catarina

Prof. Jamir João Sardá Jr., Dr.
Instituição Universidade do Vale do Itajaí

Profa. Elisa Kern de Castro, Dra.
Instituição Instituto Universitário Egos Moniz

Certificamos que esta é a versão original e final do trabalho de conclusão que foi julgado
adequado para obtenção do título de Doutor em Psicologia.

Coordenação do Programa de Pós-Graduação em Psicologia

Prof. Roberto Moraes Cruz, Dr.
Orientador

Florianópolis, 2023.

Acknowledgments

This thesis is the completion of a process that started in the middle of 2012. I was giving a Rebirthing-Breathwork training to two Russians, one of whom I had already trained in *Inspiration University*, in Waynesboro, Virginia (USA), a year earlier. The training took place in the Andalusian spring in the mountains of Southern Spain. I don't remember exactly what inspired me to start to investigate trauma seriously, but I remember that the inspiration came during that training and was related to an insight in the role the *will* plays in trauma.

I started my investigation in Spain and continued it in Florianópolis, after we moved there in 2013. I interrupted the investigation in 2014, while living and working in the US. Returning to Florianópolis in 2015 and starting to work with Dr. Roberto Moraes Cruz provided me with the opportunity to resume the investigation and to raise the scientific level of my enquiry significantly. I'm not sure if I could have met an equal level of openness, and a willingness to help me bring my project to completion in academic circles anywhere else in the world. So first of all I offer my sincere, heartfelt thanks to Roberto, who became the tutor of my master project and the promotor of the doctorate part of the investigation.

Embarking on a master's degree in a country where you barely speak the language is not always easy. Therefore it was a relief to get to know my second master's tutor, who could understand me easily when I spoke and wrote in English. Besides that she offered valuable feedback on my work. So, once again, I offer my thanks to Dra. Carolina Baptista Menezes. I also wish to thank Dr. Celso Reni Braidá for introducing me to the concept of agency at a metaphysical level during a course in contemporary metaphysics that I attended during the master's part of the investigation.

Special thanks also to Dr. Erik Baars, who didn't hesitate to become co-promotor of the doctorate part of the investigation when I requested his help after I moved from Brazil to the Netherlands in 2021 (following a recommendation by Dr. Pim Blomaard).

The empirical study of the doctorate part of the investigation would have been impossible without Marije Schaap, Liselore Kolks, and Ramon Weel, the three psychologists of Queeste that collaborated in the research project, who—apart from providing therapy—recruited and supported the participants in the project. My sincerest thanks to them, and also to Elbrig van der Poel, the manager of Queeste for her ongoing support of the project. During the initial negotiations with Queeste, Melissa Sinkeldam was also involved and I wish to thank her as well.

I am most indebted to the four women who decided to participate in the research—I won't name them for obvious reasons, but without them the empirical part of this project

would have been impossible—again for obvious reasons.

I also wish to thank the co-workers and the villagers of Brumbane, Scorlewald, for having to share my time and dedication with the last two years of this project.

Once again, I wish to thank the invisible, but not unnoticeable Spirit of our age whose assignment I accepted and who has taught me so much in return—I continue to silently sing Your Name in praise and gratitude!

This section always ends with those nearest to us, to whom we feel most indebted. In my case they are my mother, for her financial support, and of course my dearest Siddharta, Luana and Cristiane who shared the ups and downs of this project with endless love and courage.

Yo no busco, yo encuentro.

Buscar es partir de hechos conocidos y querer algo conocido en lo nuevo.

Encontrar, es lo totalmente nuevo, también en el movimiento.

Todos los caminos están abiertos, y lo que se encuentra, es desconocido. Es un riesgo, una sagrada aventura.

La incertidumbre de tales riesgos solo puede ser asumido por aquellos, quiénes en la desprotección se saben protegidos, quiénes en la incertidumbre, en la ausencia de conducción son guiados, quiénes en la oscuridad se entregan a una estrella invisible y se dejan atraer por metas, y no determinan en forma humanamente limitada y estrecha la meta.

Esta apertura hacía todo nuevo conocimiento, hacía toda nueva vivencia interior y exterior: es la esencia del ser humano moderno, quién frente a todo miedo de "soltar", experimenta, sin embargo, la gracia de sentirse sostenido en la manifestación de nuevas posibilidades.

Pablo Picasso

Resumo

Apesar dos avanços na criação de construtos diagnósticos para transtornos relacionados ao trauma, não existe, atualmente, nenhum modelo teórico abrangente para o trauma psicológico. Historicamente, as teorias do trauma relacionam o trauma psicológico a fatores biológicos ou intrapsíquicos. Mais recentemente, o trauma é cada vez mais entendido como uma desregulação de processos (neuro) fisiológicos. Modalidades terapêuticas recentes - notadamente Dessensibilização e Reprocessamento por Movimentos Oculares (EMDR) e Experiência Somática (SE) - atribuíram o trauma psicológico ao bloqueio ou desregulação de uma capacidade inata de autorregulação. SE considera essa capacidade inata uma capacidade de processar experiências traumáticas em nível somático; O EMDR considera uma capacidade de processar memórias traumáticas em um nível cognitivo. Ambas as formas de processamento são entendidas como processos (neuro) fisiológicos. Este projeto busca desenvolver um modelo de trauma baseado em uma premissa semelhante de processamento somático e cognitivo. Não procura entender essas duas formas de processamento como processos (neuro) fisiológicos, mas como manifestações de uma forma superior de agência, uma faculdade superior inteligente, criativa e curativa.

O Estudo 1 combina uma exploração fenomenológica da cognição com uma investigação aprofundada da ideia de cognição no trabalho epistemológico de Rudolf Steiner. Ele contrasta a ideia de cognição de Steiner com o conceito de cognição usado na ciência cognitiva contemporânea e valida a adaptação da abordagem fenomenológica objetiva de Goethe para a pesquisa psicológica. O Estudo 2 é um estudo observacional qualitativo que analisa relatos em primeira pessoa de clientes com TEPT em tratamento. Método: exploração fenomenológica com base na análise temática. Resultados: (intermediário, com base em 3 participantes) a experiência interior do processamento do trauma revela estágios distintos que podem ser explicados pelo acesso do self à memória traumática. O Estudo 3 é um estudo teórico que primeiro analisa os modelos e teorias históricos e contemporâneos relacionados ao trauma e ao trauma. Posteriormente, um modelo teórico de trauma é desenvolvido com base em: 1) a ideia de que o desenvolvimento humano pode ser explicado como a corporeidade (embodiment) crescente do eu humano, bem como a capacidade crescente do eu de entender o mundo por meio de atos de cognição; 2) a ideia de que experiências traumáticas quando não acessadas pelo eu podem impedir a corporeidade e/ou o ato da cognição e levar à sintomatologia relacionada ao trauma. O processamento do trauma é assim entendido como o agente humano (o eu) recuperando o acesso às áreas somáticas e cognitivas do ser humano nas quais as

experiências traumáticas permaneceram não acessadas e (re)estabelecendo a corporeidade (no processamento somático) e a compreensão (no processamento cognitivo). em processamento).

Palavras-chave: Cognição; Trauma; TEPT; Capacidade inata de auto regulação; Processamento cognitivo; Processamento Somático; Modelo teórico de trauma.

Resumo Expandido

Introdução

Apesar dos avanços na criação de construtos diagnósticos para transtornos relacionados ao trauma, não existe, atualmente, nenhum modelo teórico abrangente para o trauma psicológico. Historicamente, as teorias do trauma relacionam o trauma psicológico a fatores biológicos ou intrapsíquicos. Mais recentemente, o trauma é cada vez mais entendido como uma desregulação de processos (neuro) fisiológicos. Modalidades terapêuticas recentes - notadamente Dessensibilização e Reprocessamento por Movimentos Oculares (EMDR) e Experiência Somática (SE) – tem atribuído o trauma psicológico ao bloqueio ou desregulação de uma capacidade inata de autorregulação. SE considera essa capacidade inata uma habilidade de processar experiências traumáticas em um nível somático; O EMDR a considera uma habilidade de processar memórias traumáticas em um nível cognitivo. Ambas as formas de processamento são entendidas como processos (neuro) fisiológicos. Este projeto busca desenvolver um modelo de trauma baseado em uma premissa semelhante de processamento somático e cognitivo. Não procura entender essas duas formas de processamento como processos (neuro) fisiológicos, mas como manifestações de uma forma superior de agência, uma faculdade superior inteligente, criativa e curativa.

Objetivos

Principais objetivos:

1. Desenvolver um modelo de cognição baseado na cognição primária.
2. Desenvolver um modelo de trauma teórico abrangente, baseado em uma ontologia não materialista (de Wit, 2019) e informado por um modelo não materialista de cognição.

Objetivos específicos:

1. Desenvolver uma metodologia de utilização de experiências de primeira pessoa como dados objetivados com base na abordagem fenomenológica goethiana.
2. Realizar análises aprofundadas de relatos de trauma em primeira pessoa.
3. Desenvolver um modelo de processamento cognitivo do trauma.

Metodologia

O Estudo 1 combina uma revisão aprofundada da literatura com uma abordagem fenomenológica para investigar a cognição como uma experiência em primeira pessoa. Além disso, contrasta criticamente as descobertas com teorias sobre cognição na ciência cognitiva contemporânea. O Estudo 2 é um estudo observacional qualitativo, que analisa relatos em primeira pessoa do processamento do trauma de participantes submetidos à terapia de trauma. Utiliza-se de uma análise temática e uma abordagem fenomenológica goethiana para analisar

relatos de diários de tratamento, bem como entrevistas semiestruturadas. O Estudo 3 consta de uma revisão aprofundada de literatura para descrever o desenvolvimento histórico do trauma e modelos relacionados ao trauma desde meados do século XIX até o presente e sintetiza as descobertas do Estudo 1, Estudo 2; Estudo 1 e 3 que formou parte do mestrado deste projeto (de Wit, 2019); e uma perspectiva sobre o desenvolvimento humano inspirada na antroposofia para chegar a um modelo de trauma abrangente.

Resultados e discussão

O estudo 1 argumenta que, em sua essência, o ato de cognição é uma experiência em primeira pessoa para a qual não pode haver evidências objetivas. Usando uma forma de redução fenomenológica, Rudolf Steiner chegou à observação de que o ato de cognição consiste na síntese de uma percepção ("o conteúdo experiencial imediato apreendido pelo sujeito consciente por meio da observação") com um conceito (ou conteúdo conceitual), que é trazido pelo pensamento por meio de um ato intuitivo. Superficialmente, a observação de Steiner se encaixa na idéia, mantida pela psicologia cognitiva contemporânea, de que a percepção resulta de processos ascendentes (bottom-up) e descendentes (top-down). No entanto, análises subsequentes mostram que, em comparação a abordagem de Steiner, a psicologia cognitiva contemporânea é epistemologicamente e ontologicamente desafiada em seus métodos utilizados para chegar a essa idéia. Além disso, o Estudo 1 explora a experiência do "imediatamente dado" antes da cognição ocorrer; Se analisam criticamente os conceitos centrais de representação, objetividade e subjetividade; E argumenta que a abordagem fenomenológica Goethana é uma abordagem válida para investigar fenômenos psicológicos. Os resultados do Estudo 2 são resultados intermediários com base nos dados de três participantes. A análise quantitativa mostra que todos os três participantes processaram memórias traumáticas. A análise qualitativa dos dados revela uma imagem de três estágios de processamento de memórias traumáticas: um estágio de pré-processamento, no qual a experiência traumática ainda não foi processada; um estágio de processamento; e um estágio de pós-processamento. No estágio de pré-processamento, as memórias traumáticas têm a qualidade de impressões ou apreensões: "conteúdo experiencial imediato", ainda não "apreendido pelo sujeito consciente por meio da observação". Esse conteúdo pode ser experienciado sob a forma de intrusões, ou sentido na forma de apreensões. Durante o estágio de processamento, o sujeito mergulha no "conteúdo experiencial imediato" da experiência traumática, e o conteúdo experimental está sendo "apreendido pelo sujeito consciente por meio da observação". No estágio de pós-processamento, a agência do indivíduo traumatizado, que foi comprometida pela experiência traumática, é restaurada ou aumentada. A revisão

histórica no Estudo 3 revelou que, no século passado e meio, os modelos de trauma inicialmente se baseavam na idéia de lesões fisiológicas. Gradualmente, desenvolve-se a idéia de um componente psicológico. Desde o início do milênio, o componente psicológico é cada vez mais explicado desde uma perspectiva fisiológica. A sequência dissociação-defesa é apresentada como um modelo que explica as possíveis reações a uma experiência estressante e potencialmente traumática. Particularmente, os estágios da sequência associada com dissociação tem a tendencia a lidar a sintomas pós-traumáticos. Os modelos de trauma existentes são analisados com relação às duas polaridades relativas à natureza (psicológica ou biológica) e à causa (disposicional ou intencional) da traumatização. O modelo preliminar de trauma apresentado em de Wit (2019), baseado na idéia de processamento somático e cognitivo bloqueado de experiências traumáticas, desenvolve-se distante da perspectiva de “embodiment” e desenvolvimento cognitivo. Embodiment e desenvolvimento cognitivo são apresentados como atividades do self humano (I), pois cada vez mais torna seus próprios os processos somáticos e cognitivos envolvidos no desenvolvimento humano incorporado. Traumatização é conceitualizado como uma interrupção da individualização dos processos somáticos e cognitivos. A experiência traumática sobrepasa a força individualizante do agente humano em tornar esses processos seus próprios.

Considerações finais

Memórias traumáticas são assuntos não resolvidos que continuam emergindo até que o eu tenha se envolvido apropriadamente com eles. A auto-regulação implica acessar, engajar-se e penetrar nessas áreas. Intrusões cognitivas ou impulsos comportamentais precisam primeiro ser percebidos adequadamente. Percebê-los é a porta para o eu acessá-los. Quando percebidos adequadamente, os impulsos estranhados são gradualmente liberados e dão lugar ao eu. Quando percebidas adequadamente, as intrusões levam ao ato da cognição. O pensamento trará a tona o conteúdo conceitual e o eu será capaz de experienciar a síntese da percepção e do conceito em entendimento. Esse processamento cognitivo pode ter muitos níveis. As próprias cognições anteriores podem se tornar um dado que pode ser percebido. As cognições anteriores tornam-se percepções que são trazidas ao ato da cognição. O eu é a nossa capacidade inata de auto-regulação. Uma vez que for capaz de perceber as áreas às quais não possui acesso (completo) – sejam elas de natureza cognitiva ou de natureza somática - o eu experimenta um desejo de penetrá-las. O próprio eu humano é a faculdade inteligente, criativa e curativa mais elevada.

Palavras-chave: Cognição; Trauma; TEPT; Capacidade inata de auto-regulação; Agência; Antroposofia; Processamento cognitivo; Processamento somático; Modelo teórico de trauma; O eu humano.

Abstract

Despite advances in the creation of diagnostic constructs for trauma-related disorders there exists, at present, no comprehensive theoretical model for psychological trauma. Historically, trauma theories have related psychological trauma either to biological or to intrapsychic factors. More recently, trauma is increasingly understood as a dysregulation of (neuro)physiological processes. Recent therapeutic modalities—notably Eye Movement Desensitization and Reprocessing (EMDR) and Somatic Experiencing (SE)—have attributed psychological trauma to the blocking or dysregulation of an innate capacity for self-regulation. SE considers this innate capacity an ability to process traumatic experiences on a somatic level; EMDR considers it an ability to process traumatic memories on a cognitive level. Both forms of processing are understood as (neuro)physiological processes. This project seeks to develop a trauma model based on a similar premise of somatic and cognitive processing. It does not seek to understand these two forms of processing as (neuro)physiological processes, but as manifestations of a higher form of agency, a higher intelligent, creative, and healing faculty. Study 1 combines a phenomenological exploration of cognition with an in-depth investigation of the idea of cognition in the epistemological work of Rudolf Steiner. It contrasts Steiner’s idea of cognition with the concept of cognition used in contemporary cognitive science, and it validates the adaptation of Goethe’s objective phenomenological approach for psychological research. Study 2 is a qualitative, observational study that analyzes first-person accounts of clients with PTSD in treatment. Method: phenomenological exploration based on thematic analysis. Results: (intermediate, based on 3 participants) the inner experience of trauma processing reveals distinct stages that can be explained by the self’s access to the traumatic memory. Study 3 is a theoretical study that first reviews historical as well as contemporary trauma-, and trauma-related models and theories. Subsequently a theoretical trauma model is developed based on: 1) the idea that human development can be explained as the increasing embodiment of the human I, as well as the increasing ability of the I to understand the world by means of acts of cognition; 2) the idea that when traumatic experiences are not accessed by the I, they can impede embodiment and/or the act of cognition and lead to trauma-related symptomology. Trauma processing is thus understood as the human agent (the I) regaining access to somatic and cognitive areas in the human being in which the traumatic experiences remained un-accessed and (re-)establishing embodiment (in somatic processing) and understanding (in cognitive processing).

Key words: Cognition; Trauma; PTSD; Innate capacity for self-regulation; Cognitive processing; Somatic processing; Theoretical trauma-model.

List of Figures

<i>Figure 1</i>	<i>Psychological trauma as a result of blocked natural processes</i>	10
<i>Figure 2</i>	<i>Cognition-as-process and cognition-as-result</i>	29
<i>Figure 3</i>	<i>Comparing cognitive psychology's model of perception with Steiner's idea of cognition.</i>	55
<i>Figure 4</i>	<i>The blocking of cognitive and somatic processing in trauma</i>	80
<i>Figure 5</i>	<i>Immersion and objectivation during the processing of a traumatic memory</i>	84
<i>Figure 6</i>	<i>Flow diagram of the general design of this study</i>	88
<i>Figure 7</i>	<i>Untitled</i>	127
<i>Figure 8</i>	<i>A psychological model based on Janet's theories</i>	148
<i>Figure 9</i>	<i>Two polarities in trauma-related theories and models</i>	151
<i>Figure 10</i>	<i>The defense-dissociation sequence</i>	164
<i>Figure 11</i>	<i>Psychological trauma as a result of blocked natural processes</i>	181
<i>Figure A1</i>	<i>Hughlings Jackson model of weighted ordinal representation</i>	246
<i>Figure A2</i>	<i>Hughlings Jackson's evolution-based hierarchical model of the central nervous system</i>	248
<i>Figure A3</i>	<i>The operation of assent</i>	255
<i>Figure A4</i>	<i>Psychological tension, psychological force, and psychological tendencies</i>	257
<i>Figure A5</i>	<i>The influence of psychological force, tension, and tendencies on ideas of action</i>	259
<i>Figure A6</i>	<i>Janet's model of dynamic synthesis</i>	265
<i>Figure A7</i>	<i>The main personality and dissociated sub-systems</i>	266
<i>Figure A8</i>	<i>Dissociated sub-systems and the behavioral symptoms they give rise to</i>	267
<i>Figure A9</i>	<i>The iceberg model of the psyche including Janet's and related concepts</i>	272
<i>Figure A10</i>	<i>The field of consciousness and its penumbra</i>	274
<i>Figure A11</i>	<i>The traditional classification of the mammalian nervous system</i>	279
<i>Figure A12</i>	<i>A classification of the nervous system updated with polyvagal theory</i>	282

List of Tables

<i>Table 1</i>	<i>Summary method Study 2</i>	97
<i>Table 2</i>	<i>PCL-5 scores pre- and posttreatment</i>	100
<i>Table A1</i>	<i>The nine phases that can occur during extended connected breathing</i>	229
<i>Table A2</i>	<i>Janet’s hierarchy of psychological tendencies</i>	256
<i>Table A3</i>	<i>Five different modalities to which the term “consciousness” can refer</i>	262-263

List of Abbreviations

AIP	– Adaptive Information Processing
ASD	– Acute Stress Disorder
CAPS(-5)	– Clinician-Administered PTSD Scale (for DSM-5)
CBT	– Cognitive Behavioral Therapy
DSM	– Diagnostic and Statistical Manual of mental disorders
DST	– Dynamical Systems Theory
DVC	– Dorsal Vagal Complex
ECB	– Extended Connected Breathing
EMDR	– Eye Movement Desensitization and Reprocessing
IES-R	– Impact of Event Scale Revised
LEC(-5)	– Life Event Checklist (for DSM-5)
METC	– Medisch Ethische Toetsingscommissie (Medical Ethical Committee)
PCL(-5)	– PTSD Checklist (for DSM-5)
PSNS	– Parasympathetic Nervous System
PTSD	– Posttraumatic Stress Disorder
PTSS	– Posttraumatische Stresstoornis (Dutch name for PTSD)
REM	– Rapid Eye Movement
SE	– Somatic Experiencing
SNS	– Sympathetic Nervous System
REM	– Rapid Eye Movement
SE	– Somatic Experiencing
TA	– Thematic Analysis
UFSC	– Universidade Federal de Santa Catarina
VVC	– Ventral Vagal Complex
WHO	– World Health Organization

Table of Contents

Acknowledgments	v
Resumo	viii
Resumo Expandido	x
Introdução	x
Objetivos	x
Metodologia	x
Resultados e discussão	xi
Considerações finais	xii
Abstract	xiv
List of Figures	xvi
List of Tables	xvii
List of Abbreviations	xviii
Table of Contents	xix
Presentation	1
Introduction	4
Research Aims	13
Main research aims	13
Specific research aims	13
Study 1	14
Understanding Cognition	16
The nature of cognition as it is understood in contemporary cognitive science	16
Understanding cognition—looking for a venture point	23
Understanding cognition: an epistemological investigation	28
Rudolf Steiner’s early, epistemological works	28
Cognition: both process and outcome	29
The starting point of cognition	30
Cognition as the synthesis of percept and concept	35
On the nature of concepts and ideas and how they are acquired	39
Cognition—making sense of parts of the given	42
Knowing cognition	44
Glimpses of the immediately given and the act of cognition	45
The heart of cognition—the primary act of cognition	50
Steiner’s idea of cognition and contemporary cognitive psychology	53
Bottom-up and top-down processing	53
Comparing the model presented by Zimbardo and Gerrig with Steiner’s idea of cognition	55
Theoretical assumptions	56
Representation in cognitive science	59
Representations, presentations and understanding	62
Subjectivity and objectivity	64
Theory versus direct experience	68
Subjectivity, objectivity and theory in psychology	68
Implicit theories	69
The “cycle of enquiry”	70
Goethean Science and psychological enquiry	71
Archetypal phenomena	72
	xix

The dance of subjectivity and objectivity—understanding and presentation	75
The idea of cognition and applying Steiner’s method in psychological enquiry	76
Concluding summary	77
Study 2	79
The Inner Experience of Trauma Processing	81
The processing of traumatic memories has cognitive and somatic dimensions	81
A closer look at the cognitive processing of traumatic memories	83
Cognition as synthesis of percept and concept	86
Cognition and trauma	87
Research aims	88
Main research aim	88
Secondary research aims	88
Hypotheses	88
Method	89
Nature of this study	89
Method	89
Design	89
Participants and context	90
Inclusion criteria	91
Exclusion criteria	92
Variables	92
Materials/Instruments	93
LEC-5	93
PCL-5 (with Criterion A)	93
Corpus	95
Procedures	95
Data organization and analysis	97
Data analysis	97
Ethical procedure	98
Results	99
Trauma, treatment and interviews	99
The occurrence of trauma processing	100
The qualitative data and their preliminary analysis	101
Further analysis of the themes	103
Participant 1.1.	103
Participant 2.2.	111
Participant 4.1.	116
Discussion	125
Conclusion	127
Study 3	130
Understanding Trauma	132
Introduction	132
From railway spine to shell shock	133
The railway spine	133
“Secondary effects” of railway accidents	135
Spinal concussion and its secondary effects	138
Fright neurosis and traumatic hysteria	145
Science, law and politics and the psychological factors of trauma	147

Pierre Janet’s model of psychological functioning	149
Freud’s purely psychological explanation of trauma	151
Developments from the aftermath of WWI to the second half of the 20th century	154
Physiological processes and tonic immobility	154
Stress	156
Cognitive appraisal and coping	159
The neuroscience of fear conditioning—the work of Joseph LeDoux	163
Contemporary trauma models	165
The defense cascade	165
Fear-potentiated immobility	167
Schauer & Elbert	171
Limbic Kindling	173
Adaptive Information Processing	177
A trauma model based on human development	181
A comprehensive trauma model	181
A preliminary trauma model based on blocked somatic and cognitive processing	182
Diagnostic criteria and the phenomenological exploration of psychological trauma	190
The challenge of finding a unified explanation for the full range of psychological trauma	192
Human development	193
Embodiment	195
Cognition	199
Somatic processing and cognitive processing of traumatic experiences	205
Trauma: the loss of embodied and cognitive agency	207
Our innate capacity for self-regulation—the human I	211
A conclusion	211
Overall Summary and Conclusion	214
References	219
Appendix 1	237
The nine phases occurring in extended connected breathing	237
Appendix 2	238
PCL-5 & LEC-5 with Extended Criterion A	238
Appendix 3	241
Instructies voor het waarnemen van ervaringen van traumaverwerking	241
Appendix 4	243
Appendix 5	252
John Hughlings Jackson’s framework of cerebral localization	252
I. The nervous system as sensori-motor machine	253
II. The principle of weighted ordinal representation	253
III. Evolution-based hierarchical organization	255
IV. Concomitance of the nervous system and the mind	257
References	257
Appendix 6	259
Janet’s dissociation model: action and consciousness	259
Pierre Janet—a biographical overview	259
L’Automatisme psychologique	260

How ideas develop into acts: the operation of assent	261
Consciousness and dissociation	269
Therapeutic intervention	283
References	284
Appendix 7	286
Polyvagal theory	286
A hierarchical response strategy to environmental challenges	290
Polyvagal theory and the defense cascade	292
References	293

Presentation

This research would not exist in its present form without my own personal and professional experience with both trauma and extended connected breathing (aka *Rebirthing Breathwork*), and without my extensive study of *Anthroposophy* over the past 37 years. I consider it prudent to introduce my experience briefly before introducing the research itself.¹

I have been working with trauma—both as a concept and as experience—since I first took part in a rebirthing training on a boat in Amsterdam, at the end of November 1985. During the second day of that training I was introduced to the concept of *birth trauma*. A few hours later the concept came to life when I spontaneously appeared to relive part of my own birth trauma (and its release) during a breathwork session (de Wit, 2016, pp. 82-85). Although it was Otto Rank who first introduced the concept of birth trauma, it was the parallel work of Frédéric Leboyer—a French obstetrician who advocated a radical humanization of childbirth—and Leonard Orr—who discovered Rebirthing Breathwork—that made the concept concrete and presented it to a global audience (de Wit, 2016). After my experience in 1985 I worked for a few years as an assistant rebirther, and met Leonard Orr personally in 1987, when he lectured in Holland.

In 1988, I started a new career. I started working as a social therapist, taking care of people with (mostly) severe intellectual disabilities—and in some cases also with physical disabilities. As I learned about Anthroposophy and was trained in how to develop a deeper sense of the greater individuality of those severely disabled individuals, rebirthing and trauma—temporarily—faded to the back of my mind. Nevertheless, occasionally the concept of trauma reintroduced itself during case clinics and during compulsory trainings about sexual abuse (to which the disabled population is particularly prone due to their increased vulnerability).

In 1999, I entered a relationship with a woman who had been emotionally and sexually abused since childhood. In 2000, while working as a learning disability nurse in Northern Ireland, I first read about *Posttraumatic Stress Disorder* and its symptoms; I immediately “diagnosed” my partner as suffering from PTSD. Soon also my professional life changed; I began working with challenging young people—first in England, and later in Ireland. Many of them had suffered abuse and appeared to be troubled by trauma. In 2004, I

¹ For a brief introduction to Anthroposophy I refer the interested reader to Part II of Study 1 of my dissertation: de Wit, P. A. J. M. (2019). *Posttraumatic Stress Disorder: Theoretical Model and Evaluation of an Intervention with Firefighters in Santa Catarina* (Publication Number PSI0830-D) [Master dissertation, Universidade Federal de Santa Catarina]. <http://tede.ufsc.br/teses/PPSI0830-D.pdf>

was invited to work in a therapeutic residential unit for boys manifesting challenging sexualized behavior. In this unit I was introduced to, and trained to work with the so-called *trauma-model*, the clinical perspective from which the unit operated. The basic premise was that the boys had been traumatized and engaged in challenging sexual behavior as a way to numb the memories, the negative self-images and the negative affects that resulted from their experiences: their behavior was, as it were, a pain-killer. It was in this context that I first came in contact with the work of Peter Levine, as well as with a treatment directly inspired by *Eye Movement Desensitization and Reprocessing* (EMDR). And it was in this context that I started my graduation course in Psychology with the Open University in England, while also working full-time in the unit.

When my relationship broke up in 2007, I decided to enroll in a professional Rebirthing-Breathwork training with Leonard Orr. In 2009 I returned to Holland, to work with people with learning difficulties in an anthroposophical setting, and was soon asked to set up a new unit for clients with comorbid psychiatric problems who couldn't manage life in the normal groups. Using a combination of attachment-theory and the trauma-model perspective inherited from my work in Ireland, I developed an approach that made it possible for these people to live together in a small unit: a sheltered environment with reduced stimulation. In this same period, I finished my graduation in Psychology.

By the end of 2010 I became a professional Rebirthing-Breathworker, and in 2011 my wife Cristiane and I (we had met during the professional Rebirthing Breathwork training in 2007) joined Leonard Orr for five months as co-trainers during his trainings in Brazil, the United States and Spain. During this time I read Peter Levine's book *In an Unspoken Voice: How the Body Releases Trauma and Restores Goodness* (Levine, 2010), which worked as a catalyst. The combination of Levine's somatic trauma-concept and my various personal and professional experiences led to an epiphany and helped me understand trauma on a much deeper level.

Being unsatisfied with the quality of the written material available about Rebirthing Breathwork, I spend the first four months of 2012 writing a book about it, based on my own professional and personal experience. I eventually self-published this book in 2016 (de Wit, 2016). Subsequently (still in 2012), I began working on another book, which I gave the working-title *Understanding Trauma*. I started developing a new theoretical model for trauma based on a thorough review of scientific knowledge and the available empirical/clinical evidence, as well as on my own personal and professional experience.

In January 2013 we moved to Florianópolis, and two months later I started the process of revalidating my graduate diploma in Psychology at the *Universidade Federal de Santa Catarina* (UFSC). It was during this process that I began working with Prof. Dr. Roberto Moraes Cruz. The revalidation was completed in 2016, and when I was accepted as a master student in Psychology at UFSC in the beginning of 2017, I decided to dedicate my research to continuing the trauma-project I had started in 2012.

My master project was designed as the first phase of a larger project and the written project already included a second part that was to be concluded during the doctoral phase. I started the doctoral phase in March 2019, three weeks after obtaining my master's degree.² The project has evolved since finishing the master phase and again since the approval (qualificação) of the doctoral project. From the three studies presented here, two were already planned in the original project (Studies 2 and 3), and one is new (Study 1). Originally this project included a large Study to test the effectivity of ECB to treat PTSD. Since this study involved prolonged breathing sessions which also would bring the therapist and the participants in close proximity, it was dropped due to the perceived difficulties to guarantee everyone's safety during the COVID-19 pandemic.

Study 1 has evolved out of an unpublished article about *cognition and objectivity*, which I wrote between the second and third semester of the master study, and out of reflections upon the epistemological basis of my research during *advanced studies in epistemology* (an obligatory discipline in the first semester of the doctoral study). Study 2 has evolved out of the qualitative part of Study 3 of the master project. It has gone through considerable changes since I decided to move to the Netherlands during the COVID-19 pandemic and started working with trauma therapists that worked with different modalities of trauma treatment. The historical review of trauma- and trauma-related models in Study 3 is based on research I did in 2013 and in 2018/2019. Remaining true to the Goethean approach, the completed trauma model only emerged fully into my thinking while writing the final part of Study 3 in January 2023. It emerged quite organically, and for me this is further evidence of the intelligent, creative faculty with which I start the introduction.

Paulus A. J. M. de Wit, Schoorl, February 2023

² During the qualification of the master project the jury of professors unanimously proposed an upgrade of the project to a doctoral study. However due to a change in the department's rules for such an upgrade, which now required the publication of two scientific articles by the end of the first year of the master study, I didn't qualify for this upgrade and finished the master project in the normal time before starting the doctoral phase.

Introduction

There exists an intelligent, creative, healing faculty within each one of us that remains largely hidden from day-to-day consciousness. That is the proposition at the heart of this thesis. This hidden faculty has been alluded to by artists, scholars and others throughout the ages, mostly for its creative and problem-solving inspirations conveyed through dreams and during hypnagogic³ or other lucid states of consciousness (Barrett, 2015; Krippner, 2011; Robb, 2018; Rothenberg, 1995; Walker, 2017). There are less mentions of the faculty's healing capacity. The early mesmerists must have certainly tapped in to it, particularly the Marquis de Puységur. According to de Puységur (and others who observed his work), under hypnosis some people are able to access a state in which they can diagnose their own and others' illnesses and specify adequate treatment (Ellenberger, 1970; Vijselaar & van der Hart, 1992). In the 19th century this healing capacity went largely unmentioned. In the 20th century it resurfaced, notably in the works of C. G. Jung and Stanislav Grof, as well as in the work of other transpersonal psychologists (Grof, 1985, 1988; Grof & Grof, 2010; Jung, 2014). Contemporary scholars and clinicians mostly refer to this healing capacity as an *instinct* (Servan-Schreiber, 2004), or an *innate capacity for self-regulation* in a psychophysiological sense (Levine, 2010, 1997; McCraty & Shaffer, 2015; Shapiro, 2001, 2002; Solomon & Shapiro, 2008).⁴

The reason I have conceptualized the creative/problem solving capacity and the healing capacity into one faculty is based on first-person experiences spread out over the past 39 years⁵, as well as on studying the early epistemological works of Rudolf Steiner. Ongoing contemplation on my experiences gradually led to the realization that they can be understood as manifestations of one overarching intelligent, intentional faculty, while Steiner's work provided a firm conceptual basis to further understanding. Here follows a brief overview of my own experiences. Initially (1984-1986), what I now refer to as an intelligent faculty manifested itself mostly *outwardly* in the form of almost daily occurrences of what Jung has called *synchronicity* (Jaworski, 1996; Jung, 2014). I would have an inner question and within

³ The state of consciousness referred to as *hypnagogic* is the state during the transition from waking consciousness to sleeping/dreaming consciousness (while falling asleep), or during the transition from sleeping/dreaming consciousness to waking consciousness (while waking up). This second state (the transition from sleeping/dreaming to waking consciousness) is also referred to as *hypnopompic* (e.g. Krippner, 2011).

⁴ This list of references by no means purports to be complete; the references listed here are publications used in the rest of this study that specifically refer to self-regulation as a psychophysiological capacity.

⁵ I have chosen to use the first person instead of the third person (e.g. "the researcher") when referring to myself. Thus, the text of this thesis alternates in style between impersonal and the use of the first person. I specifically use the first person when reporting or describing first-person experiences and thought processes that are relevant or essential to the thesis and the research project. In most other cases the impersonal writing style is used.

a day it would be answered by a comment on TV, a paragraph in a book I happened to pick up, a newspaper article that caught my eye, something someone said, a song on the radio (or the constant repetition of some words of a song in my mind—until I noticed them), an advertisement, etc. In short, inwardly a question arose about something and it was as if “the universe” responded with an answer (mostly outwardly, sometimes from within). This period was followed by intense *inner* experiences of the faculty. My strongest direct, inner experiences took place during sessions of extended connected breathing (mainly divided over two separate periods: 1985-1987 and 2007-2011). Reflecting and contemplating on these manifestations is the main source of my understanding of the faculty. During connected breathing it manifests in the form of *somatic processing*, *insights*, conscious occurrences of spontaneous *cognitive restructuring*, intimate awareness of a “*benevolent presence*”, *visions*, *imaginings*, *inspirations*, and *intuitions* (de Wit, 2016). I came across still another aspect of the faculty in my work as an anthroposophically trained social therapist (1988-present). Here I learned to connect with the “*biographical plan*”, a “*higher agency*”, or the “*deeper will*” of clients (many of them with disabilities and/or intellectual deficiencies, and therefore quite unable to communicate their deeper wishes directly). Accessing this aspect of the faculty resulted in intuitions and inspirations that often gave rise to practical solutions and applications in the daily care of the clients. At the same time there was the awareness that there was a contact with the client on a deep destiny-related level (hence the terms “*biographical plan*”, “*higher agency*” and “*deeper will*”) (see also: van der Meij & de Vries, 2017). A similar encounter with the faculty took place while I took part in *u.lab* (2016), a course organized yearly by the *Presencing Institute* (Massachusetts Institute of Technology—MIT). *U.lab* is based on Otto Scharmer’s *Theory U* (Scharmer, 2016; Scharmer & Kaufer, 2013), and uses a process that is quite similar to the process used in social therapy—in *u.lab* the process is used in so-called “*case clinics*” (the *u.lab* team, 2015, pp. 10-11). Scharmer refers to tuning-in to one’s own or another’s (or our joined) intelligent faculty as “*leading from the emerging future*” (e.g. in the title of both books). On occasion (notably in 1999 and 2007) I have also been able to tap in to the faculty through dreamwork and through *Voice Dialogue* (Stone & Stone, 1989). During daily connected breathing sessions (often submerged in warm water (de Wit, 2016)), I have deliberately opened myself to the faculty for problem solving purposes and to access deeper layers of creativity (mainly for deeper insight, for contemplation/meditation, and to develop concepts I am writing about) (1986-2020). And in contemplating on cognition, and by following some of the methods described by Rudolf Steiner, I have been able to penetrate the faculty on a conscious level.

During my master study (2017-2019), it became increasingly clear to me that an essential element is missing in contemporary cognitive theories, and that this lacuna makes them unsuitable to come to a proper understanding of this intelligent, creative, healing faculty (de Wit et al., 2019). This gap in the basic understanding of cognition—in combination with the hegemony of the materialistic scientific paradigm—leaves contemporary scholars and clinicians no other choice than to build their models on evolution-based (neuro)physiological theories and to identify the healing aspect of the faculty as an instinct or a psychophysiological self-regulatory capacity. My direct experiences with the faculty over the past 39 years have made me realize that it cannot be understood from a materialistic perspective and have made me look elsewhere for answers. Thus, I have started to develop an alternative cognition model—among other reasons to account for my experiences with this intelligent faculty. This cognition model is based on the following premises:

- 1) There are different stages of “distancing” in human cognition, and the most direct form of cognition—in which there is *no* distancing, and which I have therefore called *primary cognition*, or the *primary act of cognition*—is usually entirely overlooked or ignored. This Kantian oversight essentially takes the heart out of cognition and reduces it to the manipulation of *representations* (where the faculty that performs these manipulations and the primary cognitions that are represented are left out of the discussion). Combined with a materialistic perspective this oversight leads to the equation of cognition with processes taking place in neural (or artificial, or virtual) networks, or at least considers them an *effect* thereof. There are others who have come to the realization that the essence of cognition is overlooked in modern epistemology, notably Steiner (Steiner, 1980, 1995a, 2003a), Dewey (Dewey, 1929), Merleau-Ponty (Merleau-Ponty, 2012) and Gilbert (Gilbert, 1991). Steiner’s epistemological works form the basis of the model I am developing.
- 2) Steiner understands cognition as the joining of a *percept* with a *concept*. He defines a percept as “the immediate experiential content apprehended by the conscious subject through observation” (Steiner, 1995a, p. 62).⁶ The percept, the immediate content of

⁶ Steiner’s words in German are: “die unmittelbaren Empfindungsobjekte (...) insoferne das bewusste Subject von Ihnen durch Beobachtung Kenntnis nimmt“. To minimize confusion, I have translated “unmittelbaren Empfindungsobjekte” with “immediate experiential content” (based on what Steiner writes in the preceding paragraphs). Instead of “known” I use “apprehended” to translate “Kenntnis nehmen”, to prevent confusion with the idea of “cognition”. In published English translations Steiner’s word “Wahrnehmung” has been translated with the English “percept”, which appears adequate. Steiner explains that he doesn’t want to use “Empfindung” (*sensation/sense-experience*), because it excludes observations of inner experiences such as feelings or thoughts.

experience, is subject to constant change, dependent on the relative standpoint of the observer and on processes that underlie perception. The concept, on the other hand, is not subject to change or perspectives, it is invariant, “eternal”—it is the purely mental, or rather spiritual aspect that is the inner essence of what we meet objectively in the percept. Steiner asserts that it is the human organization that separates the world in percepts and concepts, and that it is thinking that joins the two together, resulting in cognition. The percept results from observation (perception), the concept is *intuited* (Steiner, 1995a).

- 3) Primary cognitions can only be known directly, i.e. as a first-person experience. Only representations—for reasons explained there I will refer to them as *presentations* from Study 1 onward—can be objectified (observed, thought *about*, discussed, critically evaluated etc.), primary cognitions cannot be objectified. Therefore, from a representational perspective, primary cognitions appear to be *a priori* and not-knowable; for first-person experience however they can be known. They can be known/experienced *directly* (i.e. without representation).
- 4) (Re)presentations exist on different levels of abstraction. A very rough outline: at lower levels of abstraction (re)presentations are *symbolic*. Unlocking (“processing”) their symbolic nature points in the direction of the primary cognition they represent. Such (re)presentations can take the form of stories, analogies, allegories, etc., and are built predominantly on images. Examples of this level of (re)presentations are dreams, myths, fairy tales, imaginations etc. At higher levels of abstraction (re)presentations become increasingly *placeholders*—they no longer have an intrinsic relation with the primary cognitions they represent and exist independent from them. The understanding they represent needs to be actively experienced to connect to the meaning they are meant to convey. At this level representations can often be used independent of the direct understanding of the represented cognitions. They can be manipulated by following established rules (or algorithms) that make continuous remembering of the represented cognitions unnecessary. A primary example is the routine performance of mathematical operations. They can be performed by following learned rules, without the need to remember why an operation is warranted and what it does exactly. With the advance of artificial computing such operations can now also be performed by non-human programs (e.g. calculators and computer software). This makes the conscious understanding (remembering) of the represented cognitions even less necessary. An example is the use of statistical software by social scientists. Social

scientists often have little understanding of the underlying assumptions of statistical manipulations—nor of the repercussions of such assumptions (Maul et al., 2016; Michell, 2000). A further level of distancing between representations and primary cognitions are *mental constructs*. Mental constructs are cognitive *inventions*—based on combinations of / hypothesized relationships between representations that have become emancipated from the primary cognitions they represent. Mental constructs may or may not represent primary cognitions.

This thesis is a continuation of the research project started during my master study. In the master dissertation I described the initial research of two groups of phenomena—as well as what connects these two groups (de Wit, 2019). One group of phenomena is related to psychological trauma, the other to extended connected breathing (aka *Rebirthing-Breathwork*). In what follows, the description and explanation of these two groups of phenomena and their connection as given in the dissertation will be briefly reiterated and connected to the intelligent, healing faculty and the cognition model described above.

As a group of phenomena psychological trauma can be described in the form of diagnostic criteria for traumatic disorders such as those listed for *posttraumatic stress disorder* (PTSD) in the *Diagnostic and statistical manual of mental disorders* (DSM), published by the American Psychiatric Association (American Psychiatric Association, 1980, 1994, 2013). These diagnostic criteria are largely based on clinical observations, although more recently statistical analysis—notably *factor analysis*—has also started to play a role in determining the (amount of) groups or clusters in which symptoms ought to be divided (American Psychiatric Association, 2013; Armour et al., 2016; Hoge et al., 2016). DSM-5 lists the following diagnostic criteria for PTSD: a set of possible *triggering events* defined under Criterion A; and 20 *symptom groups* arranged in four clusters in Criteria B – E:⁷

1. Criterion B lists five groups of symptoms related to *intrusions*;
2. Criterion C lists two groups of symptoms related to *avoidance*;
3. Criterion D lists seven groups of symptom related to *negative alterations in cognitions and mood*;
4. Criterion E lists six groups of symptoms related to *arousal and reactivity*.

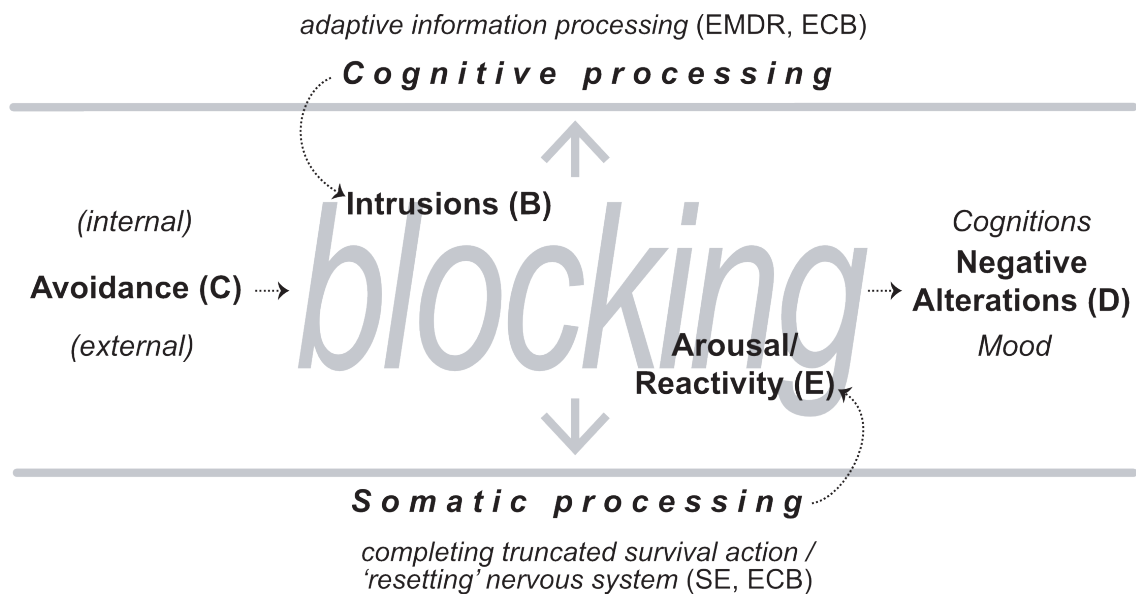
⁷ The remaining Criteria specify that the duration of the disturbance caused by the symptoms has to be longer than a month (F); that the distress or functional impairment caused by the disturbance has to be clinically significant (G); and that the disturbance cannot be attributed to another medical condition or to the influence of substance (H) (American Psychiatric Association, 2013, p.272).

In addition to the symptom groups in these four clusters, DSM-5 mentions an additional pair of *dissociative* symptoms. These dissociative symptoms are not considered diagnostic criteria for PTSD but may or may not be present in addition to other symptoms (American Psychiatric Association, 2013).

Based on the study of two therapeutic modalities with a relatively high success-rate in the treatment of trauma (*Somatic experiencing* [SE] and *Eye Movement Desensitization and Reprocessing* [EMDR] (Brom et al., 2017; Levine, 2010, 2015, 1997; Payne et al., 2015; Shapiro, 2001, 2002; Shapiro & Laliotis, 2011; Solomon & Shapiro, 2008)), and on personal as well as clinical experience with extended connected breathing (ECB) (de Wit, 2016), I have proposed a basic mechanism that can explain psychological trauma as well as its release (de Wit, 2019; de Wit & Cruz, 2021; de Wit et al., 2019; de Wit et al., 2018). In short, my hypothesis is that psychological trauma is the result of a *blocked capacity to process* potentially traumatic experiences (among others: experiences of the triggering events listed under Criterion A for PTSD in DSM-5). I propose that such processing occurs naturally (spontaneously), unless it is somehow prevented from happening. Analysis of the processes occurring during SE, EMDR and ECB has led to the hypothesis that this processing can be divided into two components: *somatic processing* and *cognitive processing* (de Wit, 2016; de Wit, 2019; de Wit et al., 2019; de Wit et al., 2018). Using this processing mechanism as the core of a basic trauma model (see Figure 1), symptoms related to intrusions (listed under Criterion B for PTSD in DSM-5) can be interpreted as spontaneous attempts at cognitive processing, or (from a negative point of view) as resulting from the blocking of cognitive processing; whereas symptoms related to arousal and reactivity (listed under Criterion E) can be interpreted as attempts at somatic processing (arousal-related symptoms), or as resulting from the blocking of somatic processing (reactivity-related symptoms). Symptoms related to the other clusters (avoidance and negative alterations in cognition and mood (Criteria C and D)), as well as dissociation (not shown), can be seen as phenomena that *accompany* the blocking (where avoidance may play a causative role in the blocking, whereas negative alterations in cognitions and mood can be interpreted as effects of it).

Figure 1

Psychological trauma as a result of blocked natural processes



Note. Schematic representation of trauma as blocked natural processes (cognitive and/or somatic processing), using the four main symptom clusters for PTSD in DSM-5 as a reference. Adaptive information processing is the term given by Shapiro to the cognitive processing during EMDR; completing truncated survival actions and resetting the nervous system are concepts used by Levine to explain somatic processing (see Study 3). Copyright 2019 by P. A. J. M. de Wit.

According to this model, resolution of psychological trauma is possible by *reducing* or *removing* the tendency to block, and (carefully) *allowing* somatic and/or cognitive processing of the traumatic experiences to occur. As shown (de Wit, 2019; de Wit & Cruz, 2021), particularly the successful application of ECB supports the hypothesis that the processing of traumatic experiences occurs *spontaneously* once allowed to occur.⁸ In turn, the finding that the processing of traumatic experiences occurs spontaneously supports the

⁸ ECB simply consists of an hour or longer of conscious connected breathing, which means that there are no pauses between inhale and exhale. Furthermore, the inhale is active and initially slightly or significantly increased (either in speed or in depth, or in both), whereas the exhale is completely relaxed. ECB is usually done in supine position (for exceptions see: de Wit, P. A. J. M., Menezes, C. B., Dias de Oliviera, C. A., Costa, R. V. d. L., & Cruz, R. M. (2018). Rebirthing-Breathwork, activation of the autonomic nervous system, and psychophysiological defenses. *Revista Brasileira de Psicoterapia*, 20(2), 29-42. <https://doi.org/10.5935/2318-0404.20180017>). It leads to a spontaneous activation of somatic and/or cognitive processing. This somatic-cognitive “cycle” can last from 15 minutes to more than two hours and ends spontaneously. ECB as proposed in this project involves no other interventions than helping the person undergoing the breathwork session to maintain a connected breathing rhythm and surrender to the process (for a more detailed description see: de Wit, P. (2016). *Learning to breathe from the breath itself: An introduction to Rebirthing-Breathwork and a phenomenological exploration of breathing*. KDP/Author.).

hypothesis of an innate capacity for self-regulation. The proposition, presented above, that this inner capacity for self-regulation is ultimately not of a (neuro)physiological, but of a “higher” nature (as already suggested in de Wit et al. (2019)) requires further research—particularly in-depth research of cognitive processing during ECB.

The outcome of the clinical case study that was part of the first stage of this project, supported the hypothesis that ECB can be used to resolve PTSD (de Wit, 2019; de Wit & Cruz, 2020). The participant, a firefighter diagnosed with PTSD, was in full remission after 8 sessions of ECB. The study also demonstrated how psychophysiological defenses can be successfully overcome to allow processing to occur (see de Wit et al., 2018, for an empirical/theoretical description of this aspect of ECB). Furthermore, there was some (statistical) evidence that heightened parasympathetic activity may be correlated with the blocking of processing.

In this second stage of the project we continue to investigate the processing of traumatic memories and to complete the development of a trauma model. The cognition model mentioned above directly informs the trauma model and serves to justify the methodology used to research cognitive processing of traumatic memories.

The social and scientific relevance of this research are as high as reported in 2019 (de Wit, 2019). The social impact of trauma is receiving increasing and sustained attention on a global scale. In the past, there was sporadic public interest for the impact of trauma. There were spikes of interest after the great wars, when hundreds of thousands of soldiers returned from the battlefield suffering from trauma, but, after the two world wars, public attention quickly subsided (Young, 1995). Since the introduction of PTSD in DSM-III (American Psychiatric Association, 1980), public attention has not diminished but appears to be steadily increasing. This appears to indicate a—perhaps critical—rise in public awareness of the significance of psychological trauma.

According to an update from the WHO-led *World Mental Health Surveys*, the proportion of PTSD rated *severely disabling* was 54.8% for developed countries and 41.2% for developing countries (Kessler et al., 2009). Between 1990 and 2000 the Global Burden of Disease estimated for PTSD rose from 0.4% to 0.6% disability adjusted life years (Ayuso-Mateos, 2006). In addition, as Cavalcante et al. (2009) point out (with regard to PTSD resulting from traffic accidents), most of the social costs of PTSD remain invisible (except for those who suffer from it). This is because PTSD doesn’t only affect the direct victims, but also those in close relationships with them. Furthermore – particularly in the case of accidents and disasters—PTSD is not limited to victims and their social circles, but can also affect

professionals attending the accident. The prevalence of PTSD in first-responders is higher than in most other professions (Marmar et al., 2006).

Estimates for *lifetime prevalence* of PTSD range from 2.1%–5.0% in the general population to 37% in post-conflict settings, to 80% among Cambodian refugees living in camps (Koenen et al., 2017; Norris & Slone, 2013). For lack of successful treatment methods, trauma has long been considered a chronic illness. This is still the most prevalent view. Considering these parameters, contributing to the understanding of successful treatment methods that lessen the global impact of trauma is of high social relevance and is highly relevant for the area of health- and developmental psychology.

Despite advances in creating diagnostic constructs for trauma-related disorders as evidenced in DSM-III to DSM-5 (American Psychiatric Association, 1980, 1994, 2013), and despite the continuing research into the dimensions of these diagnostic constructs (Armour, 2015; Armour et al., 2012; Armour et al., 2016; Armour et al., 2015; Hoge et al., 2016), at present there exists no theoretical model that leads to a satisfactory, comprehensive understanding of psychological trauma. A diagnosis implies an underlying phenomenon, but doesn't explain what the phenomenon is. Likewise, the dimensions of the diagnostic construct try to identify and distinguish salient symptom clusters, but they do not directly translate to dimensions of a theoretical construct of trauma. Clinical and empirical evidence suggest at least the following dimensions: a moral dimension (evidenced by PTSD resulting from the direct or indirect perpetration of killing and other serious contra-human actions); a cognitive dimension; an emotional dimension; a somatic dimension; and a physiological dimension.

There are several physiology-based and evolution-based models and theories that successfully explain symptom groups of psychological trauma. These include: polyvagal theory (Porges, 2001, 2011); the defense cascade model (Schauer & Elbert, 2010); a model based on limbic kindling (Scaer, 2001); and the fear-conditioning model (LeDoux, 2000). However, they are all challenged by the speed and the relative success-rates of emerging therapies such as EMDR and SE, as well as by the dimensions at which intervention is effected in these therapies.

Theories and models that primarily (or exclusively) rely on a biological basis for explaining trauma-symptoms imply that (neuro)physiological processes are the primary level on which trauma unfolds, while psychological phenomena (i.e. cognitions, affects, and changes in consciousness) are considered supervenient on the primary processes and therefore secondary (or emergent). Although often not explicitly, in essence, these models

and theories are reductionist in nature: they reduce psychological trauma to a long-term dysregulation of the (neuro)physiological homeostasis and to a pathological triggering of survival behaviors that are “hard-wired” into physiological processes through evolutionary adaptation. Such models tend to predict more or less chronic pathologies, that, once set in motion, are difficult to reverse (this particularly applies to the defense cascade model, limbic kindling and LeDoux’s fear-conditioning model). Until the relatively recent emergence of EMDR and SE, such predictions appeared to be supported by the clinical evidence of a relatively strong resistance of trauma to most forms of therapy. However, both the immediacy of results and the relatively high success-rate of EMDR and SE challenge these propositions.

A strong challenge to biology-based models and theories is that psychotropic medication can temporarily alleviate trauma symptoms, but, unlike EMDR and SE, it generally does not lead to a permanent resolution. When medication is terminated the symptoms tend to return. On the other hand, follow-up studies after successful EMDR suggest that changes are permanent (van der Kolk, Spinazzola, et al., 2007; Wilson et al., 1997). Thus, direct intervention on a physiological level generally doesn’t lead to lasting change, but certain interventions that affect unprocessed memories can.

These findings have important repercussions on the validity of theoretical trauma models. When taken seriously, recent clinical evidence doesn’t appear to support trauma models that consider physiological processes the primary basis for trauma while regarding all other levels as supervenient on biological events (de Wit, 2019).

This research project hopes to contribute to the development of an alternative theoretical trauma model that takes into account empirical evidence, without trying to explain it immediately according to theories that consider the physiological level the basis of trauma.

Research Aims

Main research aims

1. To develop a comprehensive theoretical trauma model, based on a non-materialistic ontology (de Wit, 2019), and informed by a non-materialistic model of cognition.
2. To develop a cognition model based on primary cognition.

Specific research aims

1. Develop a methodology to use first-person experience as objectified data.
2. Perform in-depth analyses of first-person reports of trauma.
3. Develop a model for cognitive processing of trauma.

Study 1

“Tell me one last thing,” said Harry. “Is this real? Or has this been happening
inside my head?”

Dumbledore beamed at him, and his voice sounded loud and strong in Harry’s
ears even though the bright mist was descending again, obscuring his figure.

“Of course it is happening inside your head, Harry, but why on earth should
that mean that it is not real?”

J.K. Rowling, 2007

Understanding Cognition

The nature of cognition as it is understood in contemporary cognitive science

I'm going to start by making, what will probably be viewed by many as a rather bold observation. When looking at the way most cognitive psychologists, cognitive scientists and contemporary philosophers concern themselves with cognition, an analogy comes to mind. If I take the liberty of using *time* as an analogy for *cognition* then it occurs to me that cognitive psychologists and cognitive scientist more in general are investigating different aspects of clocks and watches in the presumption that time somehow takes place or is produced within the mechanisms of these devices. The more theoretically inclined scientists and philosophers attempt to determine how time is bound to the mechanisms of clocks. And cognitive scientists interested in finding the exact mechanism responsible for time seem divided between those that cast their hopes on modelling time by looking at analogue time-telling mechanisms, and those that believe digital mechanisms provide a more accurate model of time.

The predominant way in which contemporary cognitive scientists and theorists explain cognition is by using *mechanistic* models of explanation. They subdivide the broad field of human cognition in separate areas such as perception, attention, memory, reasoning, etc., and try to explain these parts by proposing mechanisms that often link human biology to psychological phenomena.

In his book *Mental Mechanisms*, William Bechtel points out the difference between law-based models of explanation and mechanistic models of explanation (Bechtel, 2008). The laws of nature, as they are referred to since the 17th/18th century, are considered general, even universal principles, believed to govern the entire physical universe. Abstracting these laws from observed phenomena and expressing them mathematically is one of the objectives of the natural sciences. Once discovered or abstracted, these laws serve to explain all observable phenomena and to predict all possible phenomena. Bechtel: "laws of nature are not just descriptions of what happens. They have a modal status, specifying what must happen if the stated circumstances are obtained" (Bechtel, 2008, p. 4). He refers to models of explanation that are based on such laws (or general/universal ruling principles) as nomological. Thus, at their core, the natural sciences—perhaps with the exclusion of the life sciences—use law-based models of explanation. The early psychophysical researchers of the 19th century, in particular Fechner and those following in his footsteps, conducted sensory experiments with the goal of finding such general laws (in their case, laws related to sensory perception) and

expressing them mathematically (Fechner, 1860). These early psychophysicists sought to adopt the law-based model of explanation as encountered in the natural sciences and use it to explain aspects of human psychology. Within psychology, law-based models of explanation still feature in psychophysics, and they also play a role in the theories on which psychometrics is based (see e.g. Pasquali, 1996). More generally however, in the life sciences as well as in psychology the search for laws as explanatory principles has mostly been in vain. Yet, as Bechtel points out, this “does not mean that biologists and psychologists are not developing explanations. If one investigates what biologists and psychologists seek and treat as sufficient for explanation, it often turns out to be mechanisms, not laws” (Bechtel, 2008, p. 10).

Mechanistic models of explanation differ considerably from nomological models. Whereas the laws in nomological models are considered universal and serve to explain and predict every thinkable specific phenomena that falls under their rule, mechanisms are very specific and only serve to explain one phenomenon, or set of phenomena. Mechanistic models describe an organized series of specific operations, performed by “parts”, that are thought to be responsible for the occurrence of a phenomenon or set of phenomena. Contrasting the manner in which mechanisms are worked out with the discovery of laws, Bechtel observes: “Instead of abstracting general principles and applying them to specific cases, researchers focus from the beginning on the specifics of the composition and organization of a mechanism that generates a particular form of behavior” (Bechtel, 2008, p. 4).

Bechtel mentions René Descartes as one of the earliest advocates of explaining the phenomena observed in the natural world in terms of mechanical processes. For lack of proper empirical research methods, Descartes often used his imagination to come up with explanations modelled after known mechanical artefacts. Descartes not only used the mechanistic model to explain physical phenomena, he also extended its use to animal and human behavior—that is, as far as human behavior was comparable to animal behavior. He could, however, not imagine any mechanism that explained the purely human abilities of reasoning and language and concluded that such abilities could not arise from anything in the physical world. According to Descartes, they could only be explained by referring to a nonphysical “substance”: the mind (Bechtel, 2008).

Certainly since the past two centuries theorists have discarded Cartesian dualism and have adopted mechanistic explanations for mental phenomena. This development has gone hand in hand with the growing tendency to explain the mind as a phenomenon connected to,

or resulting from physiological processes taking place in the central nervous system. As Bechtel observes:

Cognitive scientists, and their predecessors and colleagues in such fields as psychology and neuroscience, assume that the mind is a complex of mechanisms that produce those phenomena we call “mental” or “psychological.” The mind is to be understood by uncovering those mechanisms. That is, they have extended Descartes’ mechanistic strategy to a domain he himself set aside as involving a special substance requiring special methods of inquiry. In embracing Descartes’ mechanistic explanatory strategy, cognitive scientists reject his dualism. Often they speak of the “mind/brain,” regarding the mind as what the brain does, rather than positing a mind and a brain as separate and dissimilar substances. (Bechtel, 2008, p. 2)

Cognitive scientists have been able to adopt the mechanistic model to the explanation of mental phenomena because of the addition of a key concept to the purely physical/material components to which classical mechanisms can be reduced: the concept of *information*. As many physical mechanisms process a certain substance—e.g. a knitting machine processes woolen thread—mechanisms related to mental phenomena are believed to process information. Bechtel:

The performance of a mental activity also involves material changes, notably changes in sodium and potassium concentrations inside and outside neurons, but the characterization of them as mental activities does not focus on these material changes. Rather, it focuses on such questions as how the organism appropriately relates its behavior to features of its distal environment—how it perceives objects and events distal to it, remembers them, and plans actions in light of them. The focus is not on the material changes within the mechanism, but rather on identifying more abstractly those functional parts and operations that are organized such that the mechanism can interact appropriately in its environment. Thus, mental mechanisms are ones that can be investigated taking a physical stance (examining neural structures and their operations) but also, distinctively and crucially, taking an information-processing stance. That is, cognitive scientists identify mental operations and consider how they contribute to the individual’s functioning in its environment. (Bechtel, 2008, p. 23)

As Bechtel points out in the last quote, the idea of mental mechanisms as mechanisms that process information lifts mental mechanisms to a much more abstract level than the level at which classical mechanisms are understood. Classical mechanisms consist of tangible, physical parts, and the action of these parts can be understood more or less directly from their

tangible nature and their organization. The manner of understanding involves following or visualizing (imagining) the workings of these organized parts to the outcome of the sum of operations. Nowadays mental mechanisms are to a certain degree also imagined as consisting of tangible parts (specific chemicals interacting in the nervous system). Through the operation of these tangible parts a mental process is believed to take place that is understood as the processing of information. However, this mental process is not directly understandable from the nature and the organized interaction of the tangible parts. There is an explanatory gap between the (neurological) mechanism and the mental activity. It is simply *believed* that these chemical processes in the nervous system lead to the experience of *subjective* mental activity, and that—more *objectively*—these processes form the physical substrate of information processing abilities at many different levels of abstraction (ranging from autonomic, often unconscious bodily reactions to fully conscious engagement in complex philosophical questions).

The explanatory gap leaves considerable room for imagining the nature of the information processing mechanism. In the analogy I refer to, there are those who believe that the best model to explain time is analogue and others who believe that time is best explained by using a digital model. This part of the analogy refers to the influence of connectionism. The discovery that connectionist networks can serve as a model for learning (e.g. Elman et al., 1996) pushed the explanatory model for information processing towards the “digital” side. In their basic architecture, artificial networks with hidden layers showed similarities with neural networks in the central nervous system. The ability of these artificial networks to be modified through (or “learn” from) previous inputs (“experience”) was transferred to neural networks, and gave rise to a whole new model of imagining information processing. The “representations” that were the cornerstone of analogue models (Armstrong, 1968; Beaney et al., 2007; Bechtel, 2008; Chalmers, 2004; Johnson-Laird, 1983; Newell, 1980; Perner, 1993; Ramsey, 2007; Vignolo, 2007) could be thought of as much more abstract⁹ than previously imagined, or could even be eliminated altogether from the explanatory model.

The analogy of clocks and time refers to the mechanistic model of explanation. A clock is a mechanism whose operation displays a “measure” of time. This “measure” is a form of information. The clock presents this information in an organized way, by means of a simple form of “processing”. The information is presented in the form of the regular movement of indicators over regularly divided intervals on a (mostly) circular dial, or in the

⁹ Ultimately they could be imagined as a vast web of “values” spread throughout neural networks in the form of highly differentiated chemical sensitivities in the neural connections due to previous neural activity.

form of regularly increasing numbers over a repeating series or cycle (0 to 12 or 24, and 0 to 60). The position of the indicators on the displayed regular intervals, or the numbers, *represent* hours, minutes and seconds, which are the “measures” of time. The measures of time are a convention, based on dividing a cycle in regular intervals. The cycle itself is based on a natural phenomenon: the cyclic pattern of day and night. We now understand this cycle as resulting from the regular revolution of the Earth around its axis. The common convention is that one revolution is divided into 24 hours of 60 minutes (and every minute into 60 seconds). By dividing the duration of a cycle of an earthly day into regular intervals and by creating a mechanism that is able to display or represent the cyclic progression through these intervals, we are able to represent time as information.

But, what is time? Time as we refer to it, is a *concept*. We do not experience time directly as a phenomenon. That is, we do not experience time directly in what we directly experience as “the natural world”. Our phenomenal experience of the natural world is a sensory experience and it always takes place in the present moment—it always takes place right now. In our direct experience we have some notion of time by following the progression of a moving object (for example a running dog) and observing that its position changes—it is at one position at one moment and at another position at the next moment. Yet, this observation is not purely phenomenal. Our visual experience involves movement, yet the deduction that an object is in one position at one moment and in another position in another moment requires the ability to step back from the direct visual experience and the ability to conceptualize. In our daily experience it seems as if we can see (anticipate) where the object is going, but this ability to anticipate requires conceptualization, or at least a practical consolidated memory of many previous observations of movement.¹⁰ The same happens when we move ourselves and experience our continuously changing position relative to the world around us. More generally, if we wouldn’t be able to connect our direct experience with direct experiences we have had before, we wouldn’t be able to use the concept of time. The notion of time arises thanks to our ability to remember previous experiences and connect them conceptually with our present experience.¹¹ The measure of time, as represented on a clock, requires further conceptual systematizations, namely the definition of units of this

¹⁰ It would perhaps be better to refer to this type of memory also as “experience”. However, that might lead to confusion because of the ambiguity inherent in the use of the term “experience”. The term “experience” can refer to “direct observation or participation in events”, but also to “the state of having been affected by or gained knowledge through direct observation or participation”: Experience. In. (n.d.). *Merriam-Webster Dictionary*. Retrieved December 1, 2022, from <https://www.merriam-webster.com/dictionary>.

¹¹ There is another experience which is time-related. This is easiest perceived when engaging in music and language. I will not discuss this experience here.

measure and the representation of these units as fixed positions on a dial, or as numbers. A clock does not give rise to time, it simply represents a measure of time. Time itself is not directly experienced as a natural phenomenon, it is a concept.

Not many people will think that time results from the workings of the mechanisms of a clock. Yet, unlike Descartes, almost all contemporary cognitive scientists and the majority of philosophers concerning themselves with cognitive science work from the assumption that “mental events” *are* (or in some cases are *also*) “physical events” and must therefore be identical to, caused by, or at least somehow related to events taking place in the nervous system. The degree to which mental events are considered physical events varies according to the form of *naturalism* adhered to. *Ontological naturalism* holds that mental events can be *reduced* to physical events or that the notion of mental events should be *eliminated* (so that only physical events remain) (e.g. Vignolo, 2007). *Emergentism* and *liberal naturalism* hold that mental events *arise* from physical events, but can’t be reduced to it. Emergentism and liberal naturalism attribute a level of *autonomy* to mental events (e.g. Stephan, 2005, 2006; Vignolo, 2007).¹² *Epistemological naturalism* lies somewhat in between ontological naturalism and liberal naturalism. It shares the notion that mental events are physical events, yet, not that they therefore need to be reduced to physical events—at least not as far as their *functionality* is concerned. Thus, epistemological naturalism is a form of non-reductive physicalism (but not as strong as emergentism and liberal naturalism) and it adheres to the doctrine of functionalism (e.g. Vignolo, 2007).

Thus, most contemporary cognitive theorists and philosophers consider mental events to *be*, *coincide with*, or *arise from* physical events—depending on the level of naturalism they adhere to (implicitly or explicitly). It should be noted however, that the majority of researchers in the various fields of the cognitive sciences does not really concern themselves with such nuances as whether mental events are, coincide with, or arise from physical events. Mostly they simply make inferences about mental events and their connection with physical events by studying behavior. As Held et al. (2006) summarize: cognitive psychologists, cognitive neuroscientists and philosophers of mind share the same goal, i.e. “to explain how cognitive processes are related to and can be measured via behavior, how they are computationally realized, and how these computations are biologically implemented in the

¹² See Study 1 of my master dissertation for a more detailed discussion of *emergentism*: de Wit, P. A. J. M. (2019). *Posttraumatic Stress Disorder: Theoretical Model and Evaluation of an Intervention with Firefighters in Santa Catarina* (Publication Number PSI0830-D) [Master dissertation, Universidade Federal de Santa Catarina]. <http://tede.ufsc.br/teses/PPSI0830-D.pdf>

brain” (Held et al., 2006, p. 5).

“Mental events”, “mental phenomena”, or “mental processes”, and the more abstract concept of “cognition” are largely interchangeable concepts in the cognitive sciences. In my analogy I have used the concept of time as an analogy for the concept of cognition. The analogy implies that I do not consider cognition as being caused by, or even emerging from physical (neurological) processes. So, how do I understand cognition? Before anything else, we humans know cognition as a *direct, first-person experience*. And, as I will discuss more clearly in the next sections, ultimately it is from this first-person experience that all viewpoints and theories about cognition, and all understanding of cognition, yes, all epistemologies originate. Therefore, before anything else, I want to start from and understand cognition as it is *experienced*—not as it is theorized about, not as a theoretical concept. I will substantiate my motivation for this choice in the next section.

On the same page from which the citation in the penultimate paragraph is taken, Held et al. state: “[c]ognitive psychologists study mental processes as they are indispensable for understanding human experience and behavior. They systematically observe such behavior and then draw inferences from the observed data about *unobservable* mental processes” (Held et al., 2006, p. 5, emphasis added). This statement partly represents the present stance within the cognitive sciences: physical events and behavior can be observed, and such observations form a viable basis for making inferences about cognition. Mental events on the other hand, are either considered unobservable (Held et al., 2006), or—if observation is considered possible through introspection—such observations are believed to be fundamentally unreliable and therefore unsuitable to serve as a viable basis for making inferences. Recently a group of mostly German researchers (Wagemann, 2018; Wagemann & Raggatz, 2021; Wagemann & Weger, 2021; Weger & Wagemann, 2015; Weger et al., 2018a; Ziegler & Weger, 2018a, 2018b), has started to focus on cognition as a first-person experience. They think that without investigating cognition as it arises, something quintessential is missing in our understanding of cognition (e.g. Wagemann & Weger, 2021; Weger & Wagemann, 2015; Weger et al., 2018a, 2018b; Ziegler & Weger, 2018a, 2018b). In the late twentieth century a group of cognitive scientists investigating consciousness came to a similar conclusion (Varela & Shear, 1999a, 1999b). I fully agree with this conclusion.

This quintessence of cognition can be studied through introspection in combination with a strict phenomenological approach. With this phenomenological approach I do not refer to phenomenology as it was founded by Husserl and developed further by Heidegger, Merleau-Ponty and others (Husserl, 1990; Langdridge, 2007; Merleau-Ponty, 2012; Moran,

2000). The phenomenological approach I refer to was founded by Johann Wolfgang von Goethe. Since the late nineteenth century it was further developed by Rudolf Steiner and others (Bortoft, 1996, 2012; Brady, 2006; Brook, 2009; Edelglass et al., 1997; Goethe, 1988; Hoffmann, 1998; Maier et al., 2006; Seamon & Zajonc, 1998; Steiner, 2003a). Goethe's scientific approach has been adapted to investigate cognition by Steiner (1980, 2003a) and by the German researchers mentioned above.

If we return to the analogy with which this section started, we have two concepts—time and cognition. We have seen that the first concept *is* primarily a concept (not an experience), while the opinion about the second concept is divided. Most cognitive scientists treat cognition primarily as a concept, while some researchers have started to investigate it as a first-person experience. Descartes could not imagine a mechanism, or mechanisms that could explain the higher cognitive abilities he observed in humans. He therefore concluded that such cognitive abilities do not arise from physical events, but must involve a different “substance”: the mind. Due to the enormous increase in knowledge about the nervous system and the rapid development of information processing technology, scientists studying cognition have begun to imagine biophysical information processing mechanisms that could underly cognition. They now, routinely, explain cognitive abilities in terms of biophysical events in the nervous system. They are however only able to do this by ignoring, or reasoning away the primacy of cognition as a first-person experience. For them cognition is the result of information processing mechanisms taking place in the central nervous system. And, using the analogy, for them it would be as if time really arises from the mechanisms of the clock.

A clock “tells” the time, but it can't tell us what time *is*. It is able to tell the time, because there is a relationship between our concept of time and the mechanisms of the clock. Likewise, although there appears to be a relationship between cognition and (biophysical information processing) mechanisms in the central nervous system, these mechanisms cannot tell us what cognition *is*. We cannot really understand what cognition is by investigating information processing mechanisms. To understand it, we need to look much more closely to how cognition arises and unfolds in us as a first-person experience.

Understanding cognition—looking for a venture point

Undergraduate textbooks in cognitive psychology offer a good overview of the phenomena and concepts that fall under the umbrella-concept of *cognition* in cognitive psychology. The areas covered in these textbooks usually include *perception, attention, memory/learning, language, reasoning/problem solving/judgement* and *consciousness* (compare e.g. Anderson, 2015; Eysenck & Keane, 2020; Goldstein, 2015; Matlin & Farmer,

2016). We could generalize these areas as referring to specific aspects, or *modes* of cognition. Each area features certain sensory and/or mental phenomena as well as related conceptualizations, and relates these phenomena and concepts to observable behavior. Each area focusses on a specific set of phenomena related to cognition—a mode of cognition. Although it is sometimes hinted at in the study of consciousness, and although it is hinted at in the categorization of different modes of learning/memory (i.e. knowing *how* vs. knowing *that*), the *nature* of knowledge and, more specifically, of *understanding* is usually not covered in the areas studied in cognitive psychology. In his book *Knowledge and its Limits*, the philosopher Timothy Williamson attempts to approach the nature of knowledge. He does this mostly by making deductive categorizations about knowing (Williamson, 2002). When Williamson reasons why knowing is the *most general* factive mental state, an interesting thing happens. He concludes his reasoning as follows :

... if one knows that A, then there is a specific way in which one knows; one can see or remember or ___ that A. Although that specific way may happen to lack a name in our language, we could always introduce such a name, perhaps pointing to the case as a paradigm. We may say that knowing that A is seeing or remembering or ___ that A, if the list is understood as open-ended, and the concept *knows* is not identified with the disjunctive concept. One can grasp the concept *knows* without grasping the concept *sees*, therefore without grasping the disjunctive concept. (Williamson, 2002, p. 34)

In the course of his reasoning in this short excerpt Williamson identifies certain modes of cognition (as I have called them above when referring to the areas covered by cognitive psychology). He specifically mentions “seeing” and “remembering”, but also indicates that there may be other modes. He categorizes these modes as “specific way[s] in which one knows” and then submits that there is a more general form of knowing—a form which transcends, yet is implicit in these “specific ways” of knowing. He justifies this conclusion by referring to the observation that “one can *grasp* the concept “knows” without *grasping* the concept “sees” [emphasis changed, PdW]”. I consider the verb “grasping” the most poignant verb that exists in the English language to refer to the act of understanding. It is similar to the German verb “begreifen” and the Dutch “begrijpen”, and directly refers to the (mental) act in which one is engaged in the moment of understanding. Grasping something mentally is an experience that can only be engaged in directly. It *can* only be experienced. Apart from being in the experience itself, the closest one can get to the actual experience is by engaging in introspection. However, introspection already requires that there is an *object* of observation,

which means that one has to exit the direct experience and look at the traces the experience has left behind (let us say that at best we look at an “echo” of the experience, which could be categorized as a form of remembering). Therefore, even when we engage in introspection, we do not access the direct experience itself. That only happens during the act of understanding itself. While categorizing knowing, Williamson has to appeal to every individual reader’s first-person experience of understanding to make his categorization of knowing as the most general factive mental state *understandable*. He appeals to the reader’s individual first-person experience of understanding by using the word “grasp”.

While reading the end of the previous paragraph in a more cursory fashion, the reader may conclude that Williamson’s categorization of knowing involves a form of circular reasoning. After all, he justifies his categorization of knowing by appealing to the first-person experience of the most immediate form of knowing available to the reader: the experience of understanding (or grasping) something. Simply put, he justifies his categorization of knowing, by appealing to knowing—and *without* explaining the latter in a manner that does not involve the concept of knowing. That clearly appears to involve a form of circular reasoning. But does it? Or could his reasoning be different?

If Williamson was trying to *explain* knowing, this would indeed be a case of circular reasoning. However, Williamson is not trying to describe knowing at the level of *explaining* it. He is describing knowing by making categorical deductions. In this case he categorizes knowing as the most general factive mental state.¹³ Williamson’s categorization can be seen as an attempt to objectify a general quality of knowing—not to fully explain knowing (or make it completely *understandable* in the sense of *grasping* knowing). In fact, it is impossible to explain knowing in the way anything else is explained. Anything else is explained by drawing on other known phenomena and concepts. In other words by referring to concepts that have already been grasped. I repeat, explaining something involves placing it in a context of concepts that have already been grasped. Explaining therefore *implies* knowledge, previous acts of understanding. Furthermore, the very act of explaining something *invokes* knowing—it is an attempt to present it to the reader’s thinking in such a way that they can grasp it, so that the act of understanding, which is the core activity of knowing, can occur. Explaining knowing, not only necessarily *invokes* knowing, *because*

¹³ Mental *state*, because Williamson refers to a more lasting situation than the immediate experience of understanding—the knowing he refers to is still considered to exist when the immediate experience is no longer present. *Factive*, because the mental state of knowing corresponds with an “object” that is known (a fact), outside itself. Most general, because it is not specific (as seeing, remembering, etc. are), and can’t be generalized further.

knowing is the source of all conceptual contexts there exist no concepts *outside* knowing that could serve as a context to make knowing itself understandable. The German dictionary defines “begreifen” as follows: “to grasp mentally/spiritually, to know in its context, to understand” (Dudenredaktion, 2015, p. 273; author's translation, PdW). These are all circular explanations that use concepts related to understanding to define understanding. There is no other way. Explaining knowing would mean to make it understandable to *itself*.

Ultimately, the act of knowing can only be brought to *awareness*, no additional explanation is possible or *necessary*. One way to bring the act of knowing to awareness is by *describing* it to itself. Describing it means observing it and describing those observations. As pointed out above, observing the act of knowing requires the very act to be turned into an object of observation. In other words, observing the act of knowing requires its objectification. Ultimately, this is what Williamson does—by using deductive logic he objectifies and categorizes certain qualities of knowing.

In objectifying and categorizing certain qualities of knowing, Williamson reaches a limit. Deductive reasoning and descriptions can only be *about* knowing. To make them understandable, to give them meaning, knowing *itself* needs to be invoked (and this is what Williamson does by using the word *grasp*). Ultimately, only knowing understands (or vice versa: only understanding knows).

Understanding can be observed and described, but the only direct access to it is to *experience* it. Any observation, description or deductive categorization of it requires this access. Without it they would be empty. Thus, direct access to (the experience of) the act of understanding is required to observe and describe the act. And understanding the description of the act again requires the act of understanding. Yet, it should be clear that the observation and its description occur *outside* the immediate act of understanding—they *are* not it, they are *about* it.

Williamson comes closer to cognition than most cognitive psychologists and cognitive scientists who investigate mental phenomena do. He addresses knowing almost directly. He does not subdivide cognition in different areas such as perception, attention, memory etc., and subsequently loses himself in them while forgetting about cognition's essence: the act of understanding. Neither does he make inferences about mental phenomena by studying behavior. And he does not (implicitly or explicitly) reduce mental phenomena to biophysical processes or information processing by studying the brain or artificial or virtual neural networks. Nevertheless, although he invokes it, Williamson stops short at addressing cognition as the first-person experience as which it is accessed directly. Neither does he

attempt to observe this experience.

The limit which Williamson reaches by making deductions *about* knowledge can be sensed in the whole of cognitive science—albeit far less keenly. Actual understanding may be *invoked*—as it is in the citation from Williamson’s book—it is never the direct focus of investigation in the cognitive sciences.

But there is an even deeper problem. Cognition is almost always investigated without first stripping away all previous results of cognition. Cognition is never investigated *directly*, but always through the lens of its previous results. These previous results muddy the water considerably. They seriously *bias* the investigation of cognition.

Let me explain by giving an example. We cannot directly perceive or experience that cognition arises from processes taking place in the central nervous system. The idea that cognition occurs in, or through neural (or even artificial) networks is a result of cognition. To be more precise, it is the result of a combination of theorizing and indirect observations. Most of the observations made during neurological research are indirect. With this I mean that these observations are not made directly through the senses we possess, but with the help of more or less sophisticated devices. The output of these devices is either made directly accessible to our senses (e.g. in the form of images) or needs to be interpreted by our thinking before we can make sense of it (e.g. when it concerns numerical values). But even when the output is made directly accessible to our senses, conceptualization and interpretation are still required. All these outputs need to be made understandable. That means that they need to be given meaning, mostly by being placed within a context of previous cognitions. When our investigation of cognition is based on theories—the result of previous cognitive activity—we already come laden with meaning. When we investigate cognition assuming that it takes place in the brain for example, we look for ways in which it could be connected to the processes we think take place in the brain. We almost never approach cognition completely unbiased. Our theories about cognition—which are themselves the result of cognition—almost always bias our investigation.

If we really want to understand cognition, we need to approach it completely unbiased. That means, that we will need to strip our thinking from *any* theory, from *any* previous cognition, before we approach the act of cognition itself. This is the task Rudolf Steiner set himself when he wrote his doctoral dissertation. Steiner finished his dissertation in 1891 (Lindenberg, 2012) and in 1892 he published a slightly expanded version with the title *Wahrheit und Wissenschaft. Vorspiel einer ‘Philosophie der Freiheit’* (“Truth and (Scientific) Knowledge. Prelude to a ‘Philosophy of Freedom’”) (Steiner, 1980). In the next section I will

guide the reader through Steiner's thesis.

Understanding cognition: an epistemological investigation

Rudolf Steiner's early, epistemological works

Rudolf Steiner (1861-1925) is probably best known for inaugurating the spiritual science of Anthroposophy. Directly connected to his involvement in Anthroposophy is his involvement in the development of Waldorf education, biodynamic agriculture, organic architecture, curative education and social therapy, as well as other, less well-known initiatives in the fields of art, science, medicine, and social-, economic-, and religious renewal. What is less well-known in wider circles is that during the final decades of the nineteenth century, before his involvement with Theosophy and Anthroposophy, Steiner developed a theory of knowledge that challenged the main epistemologies accepted at that time. Like Edmund Husserl, Steiner was inspired by the philosopher and psychologist Franz Brentano (1838-1917). Both Husserl and Steiner attended lectures by Brentano while they studied in Vienna during the 1880s. However, Steiner's main influence while developing his epistemology was an earlier form of phenomenology practiced by Johann Wolfgang von Goethe (1749-1832). In 1882, while Steiner was still a student at the technical college in Vienna, one of his teachers, Karl Julius Schröer, recommended him to Joseph Kürschner, who was working on a new edition of Goethe's work. Schröer recommended Steiner for editing Goethe's scientific work. Kürschner accepted the recommendation, and the first volume of Goethe's scientific writings edited by Steiner was published in 1883, when Steiner was only 22 years old. He continued to edit Goethe's scientific writings for another thirteen years (Lindenberg, 2012). During this time, Steiner wrote his main epistemological works. In 1886, while he was still living in Vienna, he published *Grundlinien einer Erkenntnistheorie der Goetheschen Weltanschauung* ("An Outline of an Epistemology of the Goethean Worldview") (Steiner, 2003a)¹⁴. In 1890 Steiner moved from Vienna to Weimar (Germany), to work at the Goethe- and Schiller archive. He worked at the archive until 1896, and during this period Steiner published *Wahrheit und Wissenschaft*. (Steiner, 1980), as well as the

¹⁴ Steiner's epistemological works have also been published in English translations. These translations have different titles than the English translations of the German titles I have added in brackets in this paragraph. I have chosen to add more literal translations of the German titles, in order to give the reader a sense of the original titles.

In the citations from Steiner's epistemological works that follow in this section, most translations from German are my own. My English in these citations may be less fluid than some of the existing translations, but I have striven to maintain the original order and logic of the words and phrases as much as possible, so that as little as possible of the original meaning gets lost. Sometimes, when I do not consider the order critical, or when I think that the original meaning is clearly conveyed in the translation, I cite directly from an existing English translation.

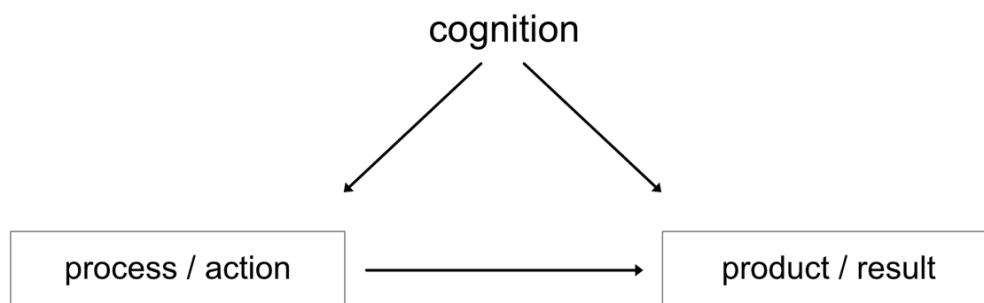
culmination of his epistemological work: *Die Philosophie der Freiheit. Grundzüge einer modernen Weltanschauung*. (“The Philosophy of Freedom. Fundamental Elements of a Modern Worldview”) (Steiner, 1995a). *Die Philosophie der Freiheit* was published in 1894. Apart from these three main works, Steiner’s introductions to the third volume of Goethe’s scientific writings, published in 1890, also contain important observations related to his epistemology (Steiner, 1987).

Cognition: both process and outcome

Before looking at Steiner’s epistemological investigations, I want to make explicit a distinction inherent in the present day use of the term cognition. This distinction is clearly reflected in definitions of cognition in contemporary English dictionaries. For example, Merriam-Webster’s Dictionary defines cognition almost tautologically as: “*cognitive* mental processes” and “also: a product of these processes” (“Cognition,” n.d.), while it defines “cognitive” as: 1) “of, relating to, being, or involving conscious intellectual activity (such as thinking, reasoning, or remembering)”, and 2) “based on or capable of being reduced to empirical factual knowledge” (“Cognitive,” n.d.). The Oxford Dictionary of English defines cognition as: 1) “the mental action or process of acquiring knowledge and understanding through thought, experience and the senses”, and 2) “a perception, sensation, idea, or intuition resulting from the process of cognition” (“Cognition,” 2015). Thus, according to both dictionaries, cognition can refer to a *mental process* or *action*, as well as to the *outcome* or *product* of that process or action (see Figure 2). In what follows I will refer to these two distinct aspects of cognition as *cognition-as-process* and *cognition-as-result*.

Figure 2

Cognition-as-process and cognition-as-result



Note. A schematic representation of dictionary definitions of cognition: cognition can refer to the process (or action) by which knowledge is established, or to the result of that process.

As we will see in this section, in Steiner’s investigation of cognition the activity of *thinking* plays a central part. It should be noted that Steiner’s use of the term thinking

includes a much wider part of cognition than our ordinary use of it. Steiner's use of the term thinking makes it practically synonymous with cognition-as-process, that is, with the *activity* of cognition.¹⁵ As a concept we presently tend to use thinking predominantly for “having” (experiencing) thoughts and for engaging in thought-related processes (i.e. “developing” and “connecting” thoughts). We tend to (naively) consider thinking an ability we “have”, something we can separate ourselves from and look at as an objective phenomenon—like any other ability we possess. We consider thinking something we *do*—we consider ourselves bigger than it, as being able to obtain a wider perspective than thinking itself from where we can look back (or down) at it. We believe that we *do* (or perform) thinking as we do any other activity, and that we *have* thoughts. What we tend to overlook when we look at thinking in this way, is that we are able to reflect on our thinking (as well as on our thoughts) as *thinking beings*. In reality, when engaging in cognition we can never really step out of thinking and look back at it—we cannot attain a perspective that goes *beyond* thinking. Yes, we can think *about* thinking as that cognitive activity (cognition-as-process) that brings forth thoughts (cognition-as-result). However, thinking is the very activity that enables us to observe these thoughts (thus, to mentally separate ourselves from them) and that distinguishes and categorizes them *as* cognition-as-result. And because we cannot obtain a wider perspective on thinking than its own perspective—and obtaining a wider perspective on something is required to observe it—thinking (as cognition-as-process) is itself never observable as direct activity. We do *experience* it directly, but we cannot observe the experience as it happens (Steiner, 1995a). Thinking *is* the direct activity of cognition as it unfolds. Furthermore, *as it unfolds*—as it is in the stage of unfolding—it is inseparable from what we experience as *ourselves*.

In most of *Wahrheit und Wissenschaft* Steiner refers to thinking as an impersonal activity (that is, without referring to the “thinker”). Only after he has defined cognition, does he reflect on the relationship between thinking and the self that engages in thinking.

The starting point of cognition

Steiner begins his preliminary remarks in *Wahrheit und Wissenschaft* with the following sentence: “Epistemology must be a scientific investigation of what all other sciences presuppose without examining it: *cognition* itself.”¹⁶ (Steiner, 1980, p. 25). Steiner

¹⁵ More precisely, Steiner uses the term thinking to refer to the (*cognitive*) activity that *underlies the act of cognition* (and I realize that this description is as circular as the definition of cognition in Merriam-Webster's dictionary).

¹⁶ The original sentence in German is: “Die Erkenntnistheorie soll eine wissenschaftliche Untersuchung desjenigen sein, was alle übrigen Wissenschaften ungeprüft voraussetzen: des *Erkennens* selbst.” The verb

develops the core of his epistemology by investigating what happens in the act of knowing. In other words, by investigating how cognition comes about—cognition as it is directly experienced. He investigates cognition-as-process. He doesn't set off by proposing a theory and explaining why this theory describes the process of cognition. Steiner uses a form of reductive phenomenology combined with systematic analytical thinking, logic and focused thought to hone in on the process itself.

Steiner begins by investigating the *starting point of cognition*. He guides the reader toward the (almost hypothetical) experience at the point immediately before cognition occurs. He then proceeds to the act of cognition by looking for a bridge between this pre-cognitive state and cognition. Steiner emphasizes that it is of utmost importance that cognition, and particularly the point immediately before cognition occurs is investigated without relying on anything that in itself already carries cognition (Steiner, 1980, pp. 49-50). No concepts that differentiate that what is experienced at this pre-cognitive point are allowed to enter the investigation. During the investigation there can for example be no notion of substance, of cause and effect, of coincidence, of polarities such as matter and spirit, or body and mind, there can be no idea of truth or mistake, there can be no designation, no predicate at all. All such notions and concepts result from cognition. What is experienced at this pre-cognitive point is what is immediately *given*—immediately given as *experience*—free from any cognitive influence. The given is what presents itself as pure experience. It cannot be interpreted as subjective or objective, as reality or illusion, as coincidental or necessary, because all such interpretations already involve cognition. There can be no interpretation or judgement at all at this point of the investigation.

Obviously—explains Steiner—to arrive at this point one has to use thinking. But, thinking may not *add* anything. It can only be used to systematically *strip away*, or *suspend* all cognition. We need to strip away, or suspend all cognition we have acquired to arrive at this point.¹⁷ This thought-led reduction, this stripping away, or suspension, means that the thinking that endeavors to examine this pre-cognitive state must actively refrain from any other concepts than those strictly necessary to carry out the reduction. It must exclude, strip away, or suspend all theoretical concepts and ideas about the given and how the given may

“erkennen” in German can be translated as “to know”, or “to comprehend”. I have translated the German noun “Erkennen” with the more general “cognition” instead of the more explicit “knowing” or “comprehension”.

¹⁷ Steiner's approach is similar to Edmund Husserl's method of *phenomenological reduction* and *Epoché* (“bracketing”). Husserl published his method roughly twenty years after Steiner. See also Cogan (2021, 19 Sept.) and Langdridge (2007)—the latter for an explanation of Epoché and phenomenological reduction in non-philosophical English.

(have) come about. All such concepts are already a product of cognition.

To get an inkling of what this means, consider the contemporary notion that what we experience is predominantly a result of certain vibrations that reach our sense-organs. And consider how interwoven this notion is with our thinking about what presents itself as our immediate experience. For example, for a part the vibrations that reach our sense organs are thought of as electro-magnetic in nature. For another part they are thought of as vibrations of molecules (such as air molecules in sound, or various types of molecules in temperature). Or they are thought of as vibrations caused by our skin touching specific materials. We learn that in our sense organs these various vibrations are then converted to physiological “signals” (of a chemical and electric nature), and that these “signals” travel to specific areas in our brains. There—in our brains—they are “processed”. This “processing” is believed to *somehow* lead to our *experience* (as of yet, scientists do not understand how these physiological processes in the nervous system can result in first-person experiences, it is merely *believed* that they do). When our thinking is implicitly guided by such theoretical concepts, this will hinder us in properly appreciating the immediately given, for we (perhaps unwittingly) carry a pre-conceived notion about the nature of the given and how it comes about. Such notions seriously contaminate the investigation and inadvertently result in a confused or misleading understanding. They must therefore be carefully put aside.

The immediately given is what we *experience* as given. We experience as given anything that *presents* itself to us. Although the immediately given is undifferentiated and undefined (if it were differentiated and defined it would already involve cognition; because what differentiates and defines *is* cognition), taking a step back and thinking about it from the point of view of cognizant beings we can say that the immediately given includes anything “that in the widest sense can arise within the horizon of our experiences: sensations, perceptions, notions, feelings, acts, dreams and imaginations, [re]presentations, concepts and ideas.” (Steiner, 1980, p. 55). This observation may initially confuse the reader of *Wahrheit und Wissenschaft*, because Steiner’s reasoning up to this point may have given the idea that what he endeavors is to reach the point before *any* cognition arises, whereas now he states that “notions”, “[re]presentations”, “concepts” and “ideas” are part of the immediately given. Notions, (re)presentations, concepts and ideas certainly form the content of cognition when cognition is active. However, in Steiner’s investigation cognition has been suspended, therefore notions, representations, concepts and ideas are no longer differentiated from anything else and form an integral part of the immediately given. The results of previous acts of active cognition become part of what we experience as immediately given.

When we suspend active cognition and maintain a blank “stare” at the immediately given, nothing happens. Because cognition is suspended, what is experienced remains completely undefined. So how, asks Steiner, can we get closer to the starting point of cognition?

What we *can* do, after we have thus made sure that no cognition intrudes upon our investigation, is to look for something *within* the immediately given that is somehow *akin* to cognition. Because we are using our thinking to investigate the starting point of cognition, we can decide to hone in upon the immediately given and investigate whether there is something there that is familiar to cognition, something with which thinking is familiar.

Steiner observes that a *question*—and questioning is undeniably an activity inherent in, and/or giving rise to cognition—can only be awakened by something that I have *not* created myself, something that presents itself to me, something that is given to me, without the direct involvement of my thinking. If I would have created the given myself, it would not give rise to questions, because I would *know* what I created (Steiner, 1980, p. 57). Well, there are aspects of the immediately given that *formally* present themselves as given, but that in fact *are* familiar to our thinking. They are familiar to thinking, because they have been *brought forth* by it. These phenomena are the above mentioned *concepts* and *ideas*. We *know* them—they are transparent to us as thinking beings, because we have brought them forth. We have brought them forth with our thinking. And, as stated above, once they have been brought forth, they become part of the immediately given (as a *product* or *result* of our cognition). When our thinking is not actively involved in them, they are experienced by us in the same manner in which we experience the rest of the immediately given. But, unlike the rest of the immediately given, we have had an intimate relationship with them; they are directly known to us and do therefore *not* give rise to questions—as the rest of the immediately given does.

Steiner observes that in order to be experienced, phenomena *have* to be given; only for concepts and ideas the opposite is true, *we* have to bring them forth when we want to experience them (Steiner, 1980, pp. 59-60). The following excerpt from *Grundlinien* may clarify the expression “bringing forth”, which Steiner uses throughout *Wahrheit und Wissenschaft*:

With regards to a thought it is clear to me that it doesn't come into being without my own activity. Before it can have any meaning for me, I have to work through a thought, I have to recreate its content, I have to experience it inwardly into its smallest nuances. (Steiner, 2003, p. 47)

Our experience of concepts and ideas appears to have a dual nature, depending on whether cognition is actively involved or not. We experience them actively and directly in the act of cognition (cognition-as-process), as they are brought forth by thinking. On the other hand, when active cognition is suspended or withdraws from them, we experience them passively (as cognitions-as-product), as an integral part of the undifferentiated given. Once they are brought forth and we withdraw active cognition, we experience them in the same manner in which we experience all other phenomena that are given.

Only when we look for something within the given with which we, as cognitive beings, have an affinity, do we begin to differentiate between two general types of phenomena within the given: phenomena with which thinking has a direct affinity, and phenomena with which thinking is not familiar and which give rise to questions. Steiner describes this direct affinity we have with concepts and ideas in a more accessible manner in *Grundlinien*. There he refers to thought-forms (concepts and ideas) as completely *transparent* to thinking; he observes: “[w]e know absolutely nothing in the world better than our thoughts” (Steiner, 2003a, p. 53). Furthermore, “[o]f every external object I am aware that it only presents its outside to my senses; of a thought I know with certainty that it presents its *all* to me—that it enters my consciousness in a form that is complete within itself.” (Steiner, 2003a, p. 47).

The decision to look for something within the given with which thinking has a direct affinity, is a sovereign decision made by thinking in order to find something within the given that cognition can take hold of.

Summarizing, by first stripping away all cognition *about* what is given to us as direct experience, and in a next step, looking for something within this undifferentiated experience that is akin to cognition, Steiner arrives at the observation that a distinction can be made between aspects that are genuinely *given*, and aspects within the given that have in fact been brought forth by thinking and that are therefore transparent to it. In this distinction lies the key to understanding cognition. In concepts and ideas we have found something that *initially*—before active cognition begins—appears to be part of the immediately given, yet at the same time concepts and ideas go beyond the immediately given in that they are entirely accessible to thinking. Thus thinking gains a foothold in the undifferentiated experience of the given by its ability to directly access those aspects that have been brought forth by itself. From this foothold the understanding of cognition proceeds.

Cognition as the synthesis of percept and concept

The differentiation between the given and concepts and ideas is artificial, because within the experience of the given they are equally undifferentiated; the differentiation is a result of a sovereign decision. By making it we have “artificially torn up the unity of the world-image” (Steiner, 1980, p. 62), and “we need to realize that the segment that we have separated from the given ... has a necessary connection with the world-content” (Steiner, 1980, p. 62). This realization leads to the next step in Steiner’s epistemology:

[The next step] will consist in restoring the unity that was torn apart to make cognition possible. This restoration occurs while we *think about the given world*. In our thinking consideration of the world the two parts of the world-content are actually united: the part on the horizon of our experience that we perceive as the given, and the part that needs to be brought forth in the act of cognition in order to also be given. *The act of cognition is the synthesis of these two elements*. For, in every single act of cognition, one of the two elements occurs as brought forth in the act itself and is added to the element that was solely given. Only at the beginning of this theory of knowledge does the element that is otherwise always brought forth appear as given. (Steiner, 1980, pp. 62-63, emphases added)

And here Steiner has formulated the act of cognition. The act of cognition consists in the *synthesis* of the given with that which is actively produced in the moment of cognition. In the act of cognition, thinking produces the conceptual part and unites it with the aspect of the given it is contemplating. Cognition *is* this synthesis.

Steiner continues as follows:

But, to permeate the given world with concepts and ideas, is thinking consideration of things. Thinking is therefore really the act by which cognition is mediated. Only when thinking, of its own accord, orders the content of the world-image can cognition come about. Thinking is an act that produces its own content in the moment of cognition. Thus, in as much as the cognized content solely flows from thinking, it offers no difficulty to cognition. There we just need to observe; and we have the essence immediately present. The description of thinking is at the same time the science of thinking. (Steiner, 1980, p. 63)

The conceptual content is brought forth by thinking and is completely transparent—*known*—to it. We don’t have to investigate it further, since we already know it completely. Therefore, *describing* thinking is all that is required of the science of thinking.

Thus, with regards to the act of cognition, two factors have to be taken into account.

The first factor is the *given*, for which Steiner also uses the terms “unmittelbar gegebenes Weltenbild” (“*directly given world-image*”, and “gegebene Weltinhalt” (“*given world-content*”). We are *passive* per-/receivers of the given. “That it is given, is not a *property* of the given”, observes Steiner, “but merely an expression of its relation to the second factor of the act of cognition” (Steiner, 1980, p. 69; emphasis added). The *nature* of the given is not revealed through this designation of the given *as given*. The nature of the given has to be revealed by thinking. The second factor that has to be taken into account with regard to the act of cognition is the *conceptual content* of the given. In contrast to the given, which we passively receive, thinking has to *actively* bring forth or create this conceptual content.

Steiner states that the conceptual content “is found by thinking during the act of cognition as *necessarily* connected to the given” (Steiner, 1980, p. 69; emphasis added). Thus, although the conceptual content is brought forth by thinking, this does not mean that thinking *invents* concepts, or makes them up arbitrarily. In the immediately given, concepts are not *apparent*. This, however, doesn’t mean that they are *absent*; it means that they do not *appear*. Steiner also refers to them as *hidden* (Steiner, 1980, p. 69). The immediately given as it appears to us, is therefore *incomplete*. Thinking creates the right circumstances for its completion. It brings order in the undifferentiated appearance of the immediately given, and thereby allows the conceptual content of the given to *reveal* itself. The conceptual content *completes* the given.

In his book *Taking Appearance Seriously*, Henri Bortoft (2012) gives an account of how the bringing forth of the conceptual content is simultaneously a creation (of something that didn’t exist as such) and a “dis-covering”, or revealing (of something that didn’t *appear*). I cite the core of Bortoft’s discourse here. Referring to the phenomenologists Edmund Husserl, Maurice Merleau-Ponty, and Martin Heidegger, as well as to the psychiatrist Iain McGilchrist, Bortoft describes the bringing forth of the conceptual content by thinking from a phenomenological perspective. He doesn’t use the terms *conceptual content* or *thinking*—as Steiner does—but instead only refers to the *phenomenon*. In Bortoft’s description a phenomenon more or less coincides with Steiner’s description of the act of cognition—the synthesis of the immediately given with the conceptual content *as-it-occurs*. The beauty of Bortoft’s description of the phenomenon is that its intimate relationship with the whole can be more fully appreciated than in Steiner’s description, and that the act of cognition is described as a live process. Bortoft emphasizes that when a phenomenon is (first) discovered or revealed, it isn’t being *separated* from the given. Rather, while being distinguished from the whole, at the same time its relationship with the whole is evident—thus it is

simultaneously being distinguished from and related to the whole. The act of cognition doesn't make a phenomenon merely a *known object*, separated from the whole. Previous to the part cited below, Bortoft gives two classic examples of the first time a specific phenomenon was distinguished: Luke Howard's classification of clouds in the early nineteenth century, and the description of muscular dystrophy by the neurologist Guillaume Duchenne in the mid-nineteenth century. In both cases the immediate reaction to the classification was that it was experienced as very natural, not arbitrarily made up. In the first paragraph of the citation below, Bortoft quotes Husserl to stress that a phenomenon—thus the synthesis of the given with the conceptual content in the act of cognition—is not merely cognition-as-a-product (something that is finished; an object), but cognition-as-process (something in the act of becoming or appearing; something dynamic, alive). In the second paragraph Bortoft points out how knowledge of a phenomenon and the phenomenon itself call *each other* forth (and not one the other). This then leads to the third paragraph, in which he makes clear how in the becoming apparent of the phenomenon discovering is also creating.

In a lecture given in 1907, Edmund Husserl points out that: “The word “phenomenon” is ambivalent because of the essential correlation between appearance and the appearing. According to this notion a phenomenon is not only something which appears, but something which appears *as appearing*” (Husserl, 1990, p. 11). The crucial point is that phenomenology is concerned with what appears in *its appearing*. So the phenomenon is not merely the appearance but the *appearance*. This is the phenomenon: the appearing of what appears. If we don't understand this, and instead think that the phenomenon is merely the appearance, then we miss what phenomenology is really about and can easily confuse it with phenomenism. We cannot describe Duchenne's discovery of muscular dystrophy epistemologically, in terms of a subject knowing an object, because in this case the object itself only appears in being known. The epistemological framework is already too late. But this does not mean that the discovery is simply subjective. Duchenne didn't just find muscular dystrophy, but then neither did he produce it. We have to find a way of thinking which “splits the difference between “finding” and “making”” (Wachterhauser, 1999, p. 144). Clearly this is paradoxical to our either/or way of thinking. What we are looking for here is expressed very clearly by McGilchrist:

One way of putting this is to say that we neither discover an objective reality nor invent a subjective reality, but that there is a process of responsive

evocation, the world “calling forth” something in me that in turn “calls forth” something in the world. (McGilchrist, 2019, p. 133; reference updated)

So the dynamics of appearance is that something in the world [which has not appeared] evokes a response [in the perceiver] which calls forth that in the world which evokes this response [it appears]. It is a dynamical whole — but the reciprocity is asymmetrical. In the language of Husserl's *Fundierung* relation, the founding term has an originality or priority in that the founded term is derived from it, but as Merleau-Ponty points out, it is not “simply derived”, because it is through the founded term that the founding term manifests — “it is through the originated that the originator is made manifest” (Merleau-Ponty, 2005, p. 458).

It looks like we create what at the same time we seem to discover, and this seems paradoxical. But McGilchrist points to an earlier tradition in the history of philosophy (which Heidegger has retrieved) for which “the act of creation may be ... one of discovery, of finding something that was there, but required liberation into being” (McGilchrist, 2019, p. 230; reference updated). In such a case, where discovery means freeing the entity into appearance, we are “finding something which is coming into being through our knowing, at the same time that our knowing depends on its coming into being” (McGilchrist, 2019, p. 231; reference updated). “Coming into being” here means “appearing”. This is why Heidegger says: “Being means appearing. Appearing is not something subsequent that sometimes happens to being. Being presences *as* appearing” (as cited in Zimmerman, 1990, pp. 224-225). (Bortoft, 2012, pp. 24-25)

In *Die Philosophie der Freiheit*, Steiner no longer uses the concepts “the immediately given”, or “the immediately given world-content, or image of the world”. Instead, he uses the term *percepts* (the translation chosen for the German “Wahrnehmungen”) (Steiner, 1995b). Thus, in *Die Philosophie der Freiheit*, the act of cognition simply becomes the synthesis of *percept* with *concept* through thinking. Steiner defines the percept as the “immediate experiential content apprehended by the conscious subject through observation” (Steiner, 1995a, p. 62)¹⁸. The percept, the immediate content of direct experience, is subject to

¹⁸ Steiner's words in German are: “die unmittelbaren Empfindungsobjekte (...) insoferne das bewusste Subject von Ihnen durch Beobachtung Kenntnis nimmt” (Steiner, 1894/1995, p. 62). To minimize confusion, I have translated “unmittelbaren Empfindungsobjekte” with “immediate experiential content” (based on what Steiner writes in the preceding paragraphs). Instead of “known” I use “apprehended” to translate “Kenntnis nehmen”, to prevent confusion with the idea of “cognition”. Steiner explains that he doesn't want to use “Empfindung” (*sensation/sense-experience*), because it excludes observations of inner experiences such as feelings or thoughts. Furthermore, he argues that 1) definitions of percepts that imply that percepts are independent of the observer

constant change, it is dependent on the relative standpoint of the observer and on processes that underlie perception/observation. The concept on the other hand, is not relative—it does not depend on the thinker—it is universal.

Thus, to summarize Steiner’s observations succinctly, what takes place during the act of cognition is the *synthesis of percept and concept* (the synthesis of the immediately given and conceptual content). And both, bringing forth the conceptual content, and the synthesis of conceptual content and percept, are activities of thinking.

On the nature of concepts and ideas and how they are acquired

According to Steiner, it is only through the synthesis of conceptual content with the percept that *reality* becomes apparent. He writes: “*Only the form of the world content that is established through the act of cognition, in which both sides of the world content [the perceptual- and the conceptual content] are united, can be called reality*” (Steiner, 1980, p. 70; emphasis in original). Thus, what we experience as immediately given—the percept—is incomplete; in it the world-content is not revealed completely, part of it is not apparent. The other part of the world content is the conceptual content that is brought forth by thinking. Only when the conceptual content is united with the immediately given, in the act of cognition, is reality revealed.

We tend to be less conscious of the conceptual content of our cognitions, and, particularly since David Hume (1711-1776) and Immanuel Kant (1724-1804), the existence of concepts as pure thought-objects and their importance in the act of cognition have been dismissed (initially) and forgotten (more recently). One of the important achievements of Steiner is that he demystified the concept of the concept and showed that concepts are something real—that they are not arbitrarily constructed by thinking, but that they reveal the *universal* aspect of phenomena that appear in a *particular* form in the given.

In *Wahrheit und Wissenschaft*, in the sentence that follows the observation that we have to bring forth concepts and ideas in order to experience them, Steiner states that concepts and ideas are given to us in the form formerly known as “intellectual seeing” (“intellektuelle Anschauung”) (Steiner, 1980, p. 60). “Intellektuelle Anschauung/intellectual seeing” is a term that was used particularly by the German philosopher Johann Gottlieb Fichte (1762-1814), and it was also discussed by Kant, and other philosophers of that era.

(i.e. that percepts are inherent in physical vibrations that reach our senses and can be traced back to the object that produce them), or 2) definitions that equate the percept with the mental representation of the object in our mind, are theoretical constructs that are themselves based on percepts, but in which the role of the percept is not recognized.

Kant uses the term “intellectual seeing” for the manner in which we directly know certain fundamental representations such as space (e.g. Kant, 2004, pp. 159-160). For Kant concepts are abstract general representations, while these “fundamental representations” are more particular (Kant, 2004, pp. xxiii-xxiv). The best contemporary English translation for “intellektuelle Anschauung” in the way both Steiner and Kant refer to it would be *intuition*—*intuition* in the sense of knowing, or experiencing the essence of an idea or concept (or in the case of Kant a particular representation such as space) *directly, immediately* from within. In *Grundlinien* and in *Die Philosophie der Freiheit* Steiner actually uses the term *intuition* (which is the same word in German) for the manner in which we access concepts. In *Die Philosophie der Freiheit* he merely states that thought-content (“Gedankeninhalt”) appears within (“Im Innern”, in other words, within the mind of the thinker, within our inner being). He explains that he uses the term *intuition* for the form in which thought-content appears, and compares it to observation by stating that intuition is for thinking what observation is for perception. (Steiner, 1995a, p. 95).

As stated above, in *Wahrheit und Wissenschaft* Steiner refers to concepts and ideas as “given to us in the form which was formerly called intellectual seeing”. By phrasing it in this way he directly refers to previous generations of German philosophers, starting with Kant. Steiner states that in “intellectual seeing” not only the thought-form (“Denkform”) is given, but the content (meaning) is given simultaneously. He explains that Kant and the philosophers that follow him do not think that human beings are capable of bringing forth meaning independently—that is, independent of empirical experience.¹⁹ Steiner uses the concept of *causality* to show that both the form and the content (the meaning) of this concept exist independent of perceived phenomena (empirical content) and must therefore exist prior to being related to perceived phenomena.

I will now briefly describe how Steiner investigates the concept of causality and show how not only his conclusion, but also the way in which he investigates the concept differ radically from Hume’s and Kant’s reasoning about causality.

The concept of causality is important in Kant’s work. For Kant, David Hume’s reasoning about causation became one of the starting points for his own critical philosophy

¹⁹ According to Kant, in human beings thought (thinking) always *represents*. It represents things (“objects”) that have been experienced (through perception). Out of itself—thus apart from representing experienced objects—thinking cannot bring forth anything real, anything not derived from perceived phenomena. Kant did allow for (mental) *constructs* that are not dependent on direct experience. However, he merely considered them structural aids for understanding and did not allow them a similar level of independent reality as he allowed perceived phenomena. See the next paragraphs.

(Kant, 2004). Both Kant and Hume *theorize* about the nature of the concept of causality (or causation); about its importance in reasoning and understanding; and about how the concept might have arisen. Hume argues that the concept of causation can *only* be derived or construed from our familiarity with phenomena that always follow each other in our experience—that is, that in our experience what we call an effect always follows what we call a cause. According to Hume we cannot come to the concept of causality separate from our experience (e.g. Lorkowski, 12 November 2021). Contrary to Hume, Kant argues that the concept of causality is not dependent on experience (it can be thought *a priori*). However, he considers it a *structure of understanding*, and rejects that “causality” as a concept should be thought of as a *thing in itself*, an object, or *being* of pure thought (a *noumenon*), even though—he concedes—it may *appear* to be such an object. What Kant allows the concept of causality to be, is a purely abstract *mental construct*, a structural aid that helps us to understand phenomena, but that has no reality outside the mind that thinks it. Furthermore, according to Kant, causality and other such concepts should never be applied to issues which do not exist within the perceivable world. Although they may invite such use, thinking must rigorously refrain from using such concepts in this way (Kant, 2004, pp. 62-68 §§27-34).

Steiner takes a very different approach. He does not *theorize* about what a concept (in this case the concept of causality) might be, or how it might have arisen. He merely *observes* the concept of causality itself. When observing its *form* (its nature) he concludes that the nature of the concept is revealed when observing it *apart* from any “empirical content” (Steiner, 1980, p. 60). In other words, only when stripping away all empirical content, the nature of the concept itself becomes clearly apparent. After stripping away all empirical content, the concept is still there, or better: only then does the concept of causality reveal itself in its pure form. The nature of the concept exists free from all empirical content. Simultaneously, when stripped of all empirical content, its ultimate, universal content, its *meaning* can be accessed in its purest form—independent of concrete examples. Thus, Steiner shows that the concept of causality *exists*—that it is inherently *real*. Not only does it exist, it exists *independent* of empirical content. When stripping away all empirical content one can observe, or rather experience the pure—sense-free—concept of causality. Both the form and the content of the concept can be experienced—they are directly accessible to thinking, without a need for empirical content.

After making these observations, Steiner concludes that the concept of causality must therefore exist *before* it can be connected to empirical content. And, unlike empirical content—which is *given* to us—we ourselves must bring forth the concept. He writes: “We

must search cause and effect in the world, but before we can find cause and effect in the world, we ourselves must bring forth [the concept of] causality [as a “thought-form”].” (Steiner, 1980, p. 60). In a posthumously published article in which he focusses predominantly on Steiner’s *Wahrheit und Wissenschaft*, Ronald Brady elucidates this sentence from Steiner as follows, “when we hear a noise in the forest we must conceive the noise to be an *effect* before we can find it incomplete without a *cause*, and only this conceptualization allows us to go in search of the latter (the cause)” (Brady, posthumous, p. 17).

Thinking brings forth the conceptual content of the given during the act of cognition. It reveals what lies hidden and thereby makes the given complete—known. According to Steiner, thinking can never do this *a priori* (before observation of the given), as Kant would believe. “Thinking”, writes Steiner, “declares nothing a priori about the given, it establishes the forms on the basis of which, a posteriori, the lawfulness [inherent] in the phenomena becomes apparent” (Steiner, 1980, p. 67). This is what McGilchrist refers to as “responsive evocation” (McGilchrist, 2019, p. 133)—see the quote by Bortoft in the previous subsection (second paragraph of the extract from Bortoft).

Steiner’s conclusion that a concept must exist prior to us finding it in the phenomena we perceive is a logical one, based on the observation that the concept exists free from empirical content. Brady gives a simple illustration of the prior existence of a concept. This prior existence does not contradict the necessity that the conceptual content that completes the immediately given (and thereby reveals reality) can only be brought forth and united with the given by thinking *after* thinking engages with the given.

Cognition—making sense of parts of the given

Steiner refers to the act of cognition—i.e. the synthesis of an observed part of the immediately given (the percept) with the intuited concept that “completes” it—as the *idea of cognition*. He gives the following—more detailed—description of how thinking makes sense of parts of the given, and specifically how it makes sense of how different parts of the given are related. To facilitate a better understanding of how cognition establishes such relationships, I will use an extended version of the example of Brady—of hearing a noise in the forest—to illustrate Steiner’s description. Here is Steiner’s more detailed description of the activity of cognition:

“when we want to know something other than thinking, we can do so only with the help of thinking—that is, thinking has to approach something given and transform its chaotic relationship with the world picture into a systematic one. [Thus,] thinking

approaches the given [world-]content as a [formative] principle. The process takes place as follows: Thinking first lifts out certain [parts] from the totality of the world-whole. In the given [nothing] actually [stands on its own], for all is continuously blended. Then thinking relates these separate [parts] to each other in accordance with the thought-forms it [has brought forth], and [finally] determines the outcome of this relationship. [By establishing] a relationship between two separate [parts] of the world-content, [thinking determines nothing about them out of itself]. Thinking waits for what comes to light of its own accord as a result of [establishing] the relationship. It is this result alone which is knowledge of that particular [part] of the world content. If the latter were unable to express anything about itself through that relationship, then this attempt made by thinking would fail, and one would have to try again. All knowledge [is based] on establishing a correct relationship between two or more elements of reality, and comprehending the result of this. (Steiner, 1981, p. 65. Words in square brackets were retranslated by the author. In the German text this section can be found on pp. 63-64)

As an illustration of Steiner's description now imagine yourself walking in the forest engaged in some cognitive activity (e.g. thinking about a problem, or about what ingredients you need to buy in order to be able to cook the meal you have planned etc.). Suddenly you hear a rustling noise. Instinctively you look for the source of the noise. The noise immediately interrupts the cognitive activity you were engaged in. The cognitive activity was not disturbed by other noises in the forest—you did not consciously hear them, but *this* noise interrupts your activity. Becoming instantly alert and trying to find the source of the noise is a *new* cognitive activity, which completely replaces the previous one. The noise is a percept—a part of the immediately given which your attention (an aspect of your thinking) has already singled out—“lifted” out of the given. You are now looking for another part of the given, of which you have no percept yet, which you can determine as the *source* of the noise. Thus, there are two things, one is a percept, a noise, and the other is something you are scanning the undergrowth for—a *missing* percept. Thinking assumes a *relationship* between these two. The missing percept is assumed to be the source of the noise. This relationship is established in accordance with the concept of *causality*. In looking for the source of the noise, you assume that something caused it. In order for this to be possible, causality must exist. Although you do not think the concept of causality consciously, it determines the relationship you are trying to establish (and it *could* be thought of consciously). When, one or two seconds after you were alerted to the noise, you see something running through the

undergrowth, this relationship is confirmed. You have now two percepts, one visual of something running and one a rustling noise. The two percepts are connected by the concept of causality, and the “something” running through the undergrowth is determined to be the source of the noise.²⁰ In another step you identify the running “something” as a squirrel. This requires the percept of the running “something” to be united with the *concept* of the squirrel (in other words, the running “something” is *recognized* as being a squirrel). This step usually goes very fast and is hardly detected. You now *know* that there is a squirrel running in the undergrowth (you see and recognize the squirrel), and you *know* that the squirrel is the source of the noise that alerted you a few seconds earlier. If you were momentarily afraid that the source of the noise was a threat, the knowledge that it is merely a squirrel will likely reassure you. This reassurance is based on the squirrel being recognized as a harmless animal. This means nothing else than that it is related to the conceptual category of “harmless animals”.

In using this example we can see the *idea of cognition* as observed and described by Steiner at work in a common experience. Note that the experience itself does not include a conscious awareness of the “idea of cognition”, or even of some of the basic concepts involved in it such as “causality” and “harmless animals”. The experience mainly involves being startled by a noise, looking for the source of the noise, and recognizing it as a (harmless) squirrel. The act of cognition itself is not recognized, or *known*, only the cognition it brings about—its product—is known.

Knowing cognition

As I wrote earlier, at the beginning of *Wahrheit und Wissenschaft*, when Steiner states the goal of epistemology, he says that all other sciences *presuppose* cognition without examining it. All other sciences *use*, or are *based* on cognition, only epistemology concerns itself with *knowing* cognition. The concepts and ideas that thinking brings forth and unites with observed phenomena in the act of cognition correspond to *forms* in the world-content. Steiner designates the cognitive counterparts of these forms as *categories* (Steiner, 1980, p. 70). The concepts and ideas that correspond to forms in the world-content are also the concepts and ideas the sciences work with when they investigate the (given) world and try to determine the categories Steiner speaks of. Only epistemology concerns itself with the idea of cognition *itself*. Epistemology’s *object* is the activity of cognition itself (the activity of cognition as immediately given). Thinking brings forth the idea of cognition as the

²⁰ In fact, the undergrowth is part of the relationship too, because the “something running” causes the rustling noise by brushing against the undergrowth, but for the sake of simplicity we will leave the undergrowth out of the equation here.

conceptual counterpart of the act-of-cognition-as-immediately-given. And in the synthesis of the act-of-cognition-as-immediately-given with the idea of cognition, cognition itself is *known*.

Glimpses of the immediately given and the act of cognition

Rudolf Steiner's approach of suspending all results of previous cognition in order to understand cognition at its *source* was essential. All approaches to understand cognition before his were based on assumptions about the nature of reality—outer and/or inner reality—and thereby already contained products of previous cognition. Biased from the outset, such approaches could and can never give a pure description of the act of cognition. Steiner's venture point is the only one which provides an unbiased view on cognition as it unfolds.

An important step in Steiner's epistemological investigation was his arrival at the existence of pure experience upon which the act of cognition unfolds. Steiner referred to this as the "immediately given". For a major part Steiner's description of the immediately given is negative—he describes what the immediately given is *not*—i.e. it cannot be described as anything which already implies cognition. Steiner's observation that the act of cognition unfolds upon the immediately given is not easy to corroborate in everyday experience. The act of cognition happens so fast that we completely overlook it. This is also the reason why we are normally not aware of the immediately given as a real experience. The act of cognition has already taken place before we get a chance to experience anything without involving cognition. However, it is possible to catch glimpses of the immediately given and to witness the act of cognition unfold.

Occasions when we awaken slowly from sleep provide an opportunity to study the act of cognition as it unfolds. On such occasions the act of cognition unfolds less rapidly than when we are in a normal state of consciousness. I will describe an example from personal experience. During the occasion on which I made the following observations the process of waking up occurred slower than usual. Yet, my awareness was present throughout the experience. I ascribe the reason for this constellation to the fact that I woke up from a slumber on the beach, while my body was uncomfortably hot. This uncomfortable feeling roused me from complete unconsciousness, yet the reluctance to fully engage with it held the process of completely waking up back long enough to witness the process unfolding as if in slow motion. I have described my experiences in the present tense, to stay as close as possible to the description of a direct experience.

I am slowly waking up from a momentary slumber on the beach. As the process of waking up commences, there is at first an immediate and pervading sense of heat and a grainy, humid stickiness; there is also a quality of undifferentiated sound. I gradually become aware of being embodied, and part of this embodiment feels sticky, grainy, humid. These are sensations first, without concepts (I don't identify them, I just experience them in one undifferentiated experience—quite close to what Steiner refers to as the undifferentiated immediately given). The sticky, grainy, humid experience comes from my hand (which I also haven't consciously identified yet, but it is vaguely distinguished from the experience of the rest of my body, which I experience mainly as uncomfortably hot and sweaty—I don't experience the sticky, grainy, humid feeling as my hand, or as an “area” separated from the rest of my experience; these concepts [“hand”, “distinguished areas”] aren't there yet; it simply constitutes *part* of my experience, not separate from the rest of the experience, only with a different quality to it; apart from this difference in quality it is part of the same overall experience, and I am aware that this quality only applies to “*part*” of the experience). Gradually the sounds start to become differentiated, while—almost simultaneously, accompanied by the concepts of space and distance—the realization of being in space dawns. I hear unfamiliar voices yelling, in the distance. I identify the experience of undifferentiated rumbling as the thundering sounds of the waves crashing in the surf nearby. As my consciousness becomes more focused, the burning heat on my back and the red brightness that I perceive through my closed eyelids connect and I become aware of the source of the light and heat: the mid-morning sun, high in the sky above me (I haven't opened my eyes yet, so I haven't seen the sun, I “feel” it—but this means that I have connected the concept sun to the perceptions of hotness and light; and in my mind I “sense/picture”—even *know*—the sun high in the sky above me). I now gradually open my eyes and look straight at what are my fingers in the sand. The image I see now makes sense of what I experienced previously. The image draws in the concepts of moist, sticky, grainy sand, and of sweaty fingers. My fingers are half buried in the moist, grainy sand, and, in the experience I had before I opened my eyes, I didn't identify my fingers as separate from the warm, moist, sticky, grainy feeling that their contact with the sand produces. Seeing draws in the concepts of the separate parts of sand and fingers, and their respective properties (sticky, moist, grainy, warm, sweaty). I no longer merely experience the sensations of moistness, warmth, stickiness and graininess, I am making sense of it by connecting the concepts

to what I perceive—I identify the separate parts as well as their mutual relationship. I slowly widen my gaze and become now fully conscious of lying on the beach. All percepts and corresponding concepts are now connecting to the full experience and awareness of my embodied self, lying on the beach, close to my house. I hear my wife and children playing somewhere nearby and turn myself up and sideways to see them... (personal note, December 2019)

Through their particular organization and development, some individuals are able to stay much closer to the experience of the immediately given than most of us do. One example of such an individual is Donna Williams. Donna Williams (1963-2017) was an Australian best-selling author. She was also an artist, a qualified teacher and a public speaker. At the age of 2 Williams was diagnosed as psychotic. Eventually, in her mid-twenties, she was diagnosed with autism (Williams, n.d.). During the first years of her life her experiences came very close to what Steiner refers to as the immediately given. Her descriptions of her experiences offer a rare glimpse of how the world is experienced with almost *no* cognition. I am citing five excerpts from Williams' book *Autism and Sensing: The Lost Instinct* (Williams, 1998). They offer a detailed description of the immediately given and the beginning of the process of cognition and thereby bring color to Steiner's general observations.

To start, here is a more general description of her experience of the immediately given:

Perhaps this feeling comes from a time before words, before thought, before interpretation, before competition, before reliance on the conscious mind and before identity, in a time when all new experiences are equal in their worth and there is, as yet, no discrimination and no established sense of boundaries or hierarchy. This is a time when, without boundaries or restriction, one *is* "the whole world" and everything experienced of that world *is* an indistinguishable and resonant part of one's self with no need to explore it as a separate entity.

If there has ever been a sense of home, a sense of belonging, a sense of equality and harmony, it must be here, for the "be" is the home we come into the world with and the "appear" is about the home we learn to construct in its absence. And yet, for most people, the "be" probably begins to be discarded from the time they are born; perhaps, for some, even sooner. In almost all people, it is gone by the time one seeks to control and limit sensation, when one begins to think, to formulate expression through words, to discriminate and form hierarchies of relative significance and personal

significance; as one moves from the system of sensing into the system of interpretation. (Williams, 1998, Introduction, para. 5-6)

In the next excerpt, she gives a more detailed account of some of her experiences up to the age of four. Her experiences were not completely devoid of meaning. However, her ability to afford meaning and context to her experiences was highly impaired.

Up to the age of four, I sensed according to pattern and shifts in pattern. My ability to interpret what I saw was impaired because I took each fragment in without understanding its meaning in the context of its surroundings. I'd see the nostril but lose the concept of nose, see the nose but lose the face, see the fingernail but lose the finger. My ability to interpret from what I heard was equally impaired. I heard the intonation but lost the meaning of the words, got a few of the words but lost the sentences. I couldn't consistently process the meaning of my own body messages if I was focusing in on something with my eyes or ears. I didn't know myself in relation to other people because when I focused processing information about "other", I lost "self", and when I focused on "self", I lost other. I could either express something in action or make some meaning of some of the information coming in but not both at once. So crossing the room to do something meant I'd probably lose the experience of walking even though my body did it. Speaking, I'd lose the meaning of my own sounds whilst moving. The deaf-blind may have lost their senses; I had my senses but had lost the sense. I was meaning deaf, meaning blind; interpretation and the realm of mind wasn't a reliable or consistent system for me. I remained reliant far longer than most people on an earlier system: the system of sensing. (Williams, 1998, Chapter 4, para. 1)

Williams describes a precognitive state of merging with experience which she refers to as *sensing*. When comparing it to Steiner's description of the immediately given, it becomes clear that in sensing, Williams had access to an experience of unity which is not apparent in Steiner's minimal description of the immediately given. This experience was already hinted at in the second paragraph of the first citation, here follows another description.

Recently, having moved out of this sensory I looked up at a huge overhead head chandelier and remembered the drug-like addictive effect such an experience once had on me. When asked about it, I recalled experiences like it as "merging with God" because I would resonate with the sensory nature of the object with such an absolute purity and loss of self that it was like an overwhelming passion into which you merge

and become part of the beauty itself. It was the ultimate in belonging and “company”. The feeling was completely compelling and addictive and by comparison the call of the world of interpretation seemed pale, weak, insignificant, foreign and of little reward. (Williams, 1998, Chapter 1, From the 'What' to the 'Why', para. 5)

Later in her book, Williams compares the quality of the state of sensing (which she refers to as “the Sensory”) to the quality of two consecutive states involving cognition (she refers to these respectively as “the Literal” and “the Significant”):

It was through sensing that I established a depth of familiarity to which no amount of knowing or facts could add anything at all.

The knowing and interpretation of mind, by contrast, involved establishing familiarity from the outside-in and was a clumsy system based on observation. Sensing, by contrast, involved establishing familiarity from the inside-out and was a purer system that involved none of the distortions of constructed mind-self or discrimination between what the constructed mind-self considered worth knowing and what it did not. (Williams, 1998, Chapter 4, Cognitive Mechanics, para. 13-14)

Finally, here is an excerpt in which she describes how, at age seven, she first had to order her experience *physically* in order to then be able to organize it *cognitively*. She describes how she had to take apart a doll house and physically organize the different parts, in order to be able to make sense of and play with it as a whole:

I was given a doll's house when I was seven. I loved “it” - the bright red smooth glossy contoured triangular form with the great rih-rih noise made by running the back of the hand over the plastic hollow form which was “the roof” and the smooth woody tock-tock, slot together hard square white surfaces which were the walls and the collection of plastic chewable forms of various colours, contours and pliability which were the dolls and furniture. I spent my time disassembling the component parts to create the perfection of unmuddied water. The roof, walls, furniture and dolls were kept separate. Later, I used the walls to keep various categories of furniture separate and the dolls all stayed in one category separate from the furniture. Only once I'd unmuddied all the forms could I explore the various structured ways in which the forms could justifiably become muddied according to purpose. (Williams, 1998, Chapter 2, Losing One's Mind, para. 1)

Descriptions as these provide rare glimpses of the act of cognition as it unfolds. They are quite consistent with the results of Steiner’s investigation of the starting point of cognition.

The heart of cognition—the primary act of cognition

Ronald Brady points out that the act of cognition normally happens so fluently and effortlessly that we are not aware of it (Brady, posthumous). According to Brady, we are normally not aware that it is carried out in the form of an intentional act. Only when the act falters—thus, when we cannot immediately make sense of an experience—do we become aware that we have to exert an effort, and that cognition does, in fact, involve volitional activity. Brady gives examples of this. He presents an extremely grainy picture and asks the reader to discover what it represents. Step by step the reader is guided to discover the conceptual content that matches the image presented to the eyes. The conceptual content that fits makes the picture *suddenly* intelligible. The image is suddenly recognized. Once the synthesis between percept and correct conceptual content is accomplished, cognition appears effortless. Other examples Brady refers to are so-called ambiguous images or reversible figures (such as the Necker cube), and the impossible pictures created by M. C. Escher. In such cases, where the process of cognition momentarily shifts or falters, we have a chance to become aware of the act of cognition itself and glimpse its intentionality. Contemplating on such experiences can clarify what Steiner means when he states that in human consciousness the idea of cognition *is immediately given* when the I is engaged in cognition (Steiner, 1980, p. 71). The idea is realized, but, because it normally occurs so fluently, we mostly experience it as if it occurs without our involvement. It appears as if cognition simply happens. It is experienced as immediately given. We are not aware of the initial separation and the subsequent synthesis of percept and concept. The process escapes our conscious attention. During the act of cognition, our focus is on the *object* of cognition, not on the *process* of cognition. Only when we momentarily cannot make sense of the object of cognition do we become aware of the *effort* that is required and do we get a chance to catch a glimpse of the process of cognition—however briefly. Accounts by individuals like Donna Williams, as those cited in the previous section, also offer a deeper insight in the act of cognition as it unfolds.

Before anything else, *knowing* is a *direct, first-person experience*. Although we tend to overlook the act of cognition completely, we *do* experience it. While we cannot observe a direct experience as it happens, we can observe it afterwards. We have the ability to recall and observe its experiential qualities. This is not dissimilar to the recall of dreams. Here the quality of observation is not as robust as in the observation of phenomena that we can approach as objects. The act of recall, when successful, yields glimpses of the experience.

These glimpses are short moments in which the direct experience is recreated. The act of observation consists in allowing one's awareness to oscillate between recall and reflection upon the recreation of the experience. Like the recall of dreams, the recall of direct experiences of acts of cognition can be practiced and becomes more robust through practice. The experience is often also accompanied by secondary experiences, such as accompanying thoughts or feelings. For example the feeling of joy or contentment that understanding can bring. Bringing awareness to such secondary experiences can also help to facilitate the recollection of the experience of the act of cognition itself. Once we recollect qualities of the act of cognition as it is experienced, we can describe them.

In the first section, I cited Timothy Williamson's phrase "One can grasp the concept *knows* without grasping the concept *sees*" (Williamson, 2002, p. 34). *Grasping*, or *understanding* the concept "knows" only occurs when the concept "knows"—its meaning—momentarily becomes completely transparent to me. And even that is not a completely satisfactory description of what occurs when I understand the meaning of a concept. Possibly the best way in which I can describe the quality of what occurs when I *grasp*, or *understand* a concept is that I momentarily become *one* with its meaning. Its meaning momentarily fills, or becomes my whole *experience*. Anything that was my experience prior to the concept recedes as the concept completely fills my experience. I have a more or less robust sense that my experience is *mine*—in other words, that *I* am having this experience—but even this sense of "I" momentarily recedes, gives way, or opens itself up to the direct experience of the meaning, or the *content* of the concept. The direct experience of a concept is nothing short of *communion*—of being at-one with. I momentarily *become* the meaning. This is the core quality of the direct first-person experience of understanding. I refer to this experience as the *primary act of cognition*.

Earlier I distinguished cognition-as-process from cognition-as-a-result, but during the immediate first-person experience of cognition this distinction doesn't exist—cognition merely *is*, understanding *fills* me. Only when I emancipate myself from the immediate experience of cognition does it become meaningful to differentiate between cognition-as-process and cognition-as-a-result. *During* cognition—while I *am* the cognition—knower and knowledge are one unified experience. During the primary act of cognition, I do not know myself as *separate* from the knowledge. I have, momentarily, opened myself up, in order for the knowledge to become one with me.

I *experience* a primary act of cognition. But I cannot observe it *while* I am experiencing it. To observe it I would have to inwardly separate myself from it, but if I would

separate myself from it, I would cease to experience it. From a contemporary scientific perspective this impossibility creates a problem. The problem is that I can “prove” the existence of primary cognition *only* to myself—I *know* it instantly *as-it-happens*. I cannot prove it to others. I cannot even *show* it to others. Since the primary act of cognition only exists as-it-happens, it cannot be captured. I can recall the experience, reflect upon it and describe it, but its description is not the primary act of cognition itself. There is no proof of the primary act of cognition *outside* of its direct first-person experience. Therefore, all I can do is *point out* its existence and describe it, and trust that others can verify its existence *in their own experience*.

Understanding is the heart of cognition—communion with the *meaning* of the object of cognition. What we normally refer to as thinking unfolds on the *basis* of understanding. In the thinking that we are conscious of, the concepts and ideas whose meaning we grasp (become one with in the primary act of cognition) appear to have become somewhat consolidated, or have a less ephemeral appearance. We have the ability to create mental images (or the mental counterpart of any other sense-impression) of aspects of the perceptual world we observe. If we observe a dog for instance, we can form a mental image of the dog, and afterwards we still have access to that image—we can recall or recreate it, also when we no longer perceive the dog directly. The quality of such images can vary greatly, from being infused with multiple sense-impressions and almost “life-like”, to sketchy, or schematic. They can even be almost purely conceptual (consisting of hardly any imagery or sense-impressions). Our perceptions are generally infused with meaning due to our constant cognitive activity, and so are the mental images that we create and that inhabit our mental life. The consolidation of concepts and ideas mentioned above, is linked to these mental images. It can also take the form of terms or words, or symbols that call forth the experience of the concept. These images, terms or symbols *anchor* the concepts and ideas they are connected with. Contrary to the direct experience of concepts at the level of understanding, these mental forms—be they in the form of mental imagery or in the form of mental terms or symbols—are observable. In German these mental forms are referred to as “Vorstellungen”. By creating them we make these forms *present* to ourselves, therefore I think that it is apt to follow the German example and use the English term *presentations* to refer to them, rather than the usual “representations”. When we are conscious of our thinking, it often appears as if we are mentally manipulating these forms. Yet, while we are thus engaged, ideally we remain closely connected to the understanding of the meaning of the concepts we work with. If we remain closely connected to the understanding of the concept, than this must mean that we

remain close enough to the primary act of cognition to have at least an inkling of the concept's meaning. Thus, when we are thinking, we intuitively know what we are engaged with, while at the surface it appears as if we are “merely” manipulating presentations. It is almost as if our thinking throws shadows of the concepts and ideas we are engaging ourselves with on a mental screen that we face—these shadow images being the aforementioned presentations—and that we are able to keep track of what happens in our thinking by following these shadow images. If we become too focused on the shadow images, we can become disconnected from the meaning of the concepts and ideas we are engaging with. If we lose this connection, we no longer really understand what we are doing. In that case we go “through the motions” of thinking, devoid of real understanding²¹—we have lost touch with the primary act of cognition and our thinking has become a form of “shadow-thinking”. When we catch ourselves, we have to return to the original concepts, grasp their meaning again and then move through the process of thinking once more, trying not to lose the connection with the meaning of the concepts as they are transformed by our thinking. Only then do we understand while we are thinking.

In the last two paragraphs I have tried to describe two levels of the process of cognition as they can be experienced and perceived. At the heart of the process of cognition lies the act of understanding—communion with the conceptual content of the objects of our thinking. In order to think consciously we use mental *presentations*—mental creations based on our perceptions, combined with the concepts connected to them. Although it may appear to be just that, thinking (cognitive activity) is not merely the mental manipulation of these presentations. Understanding—knowing—only occurs when we remain connected with the primary act where we grasp meaning.

Steiner's idea of cognition and contemporary cognitive psychology

Bottom-up and top-down processing

Anyone who is more than superficially familiar with contemporary thinking about perception in cognitive psychology will notice certain similarities between one of the basic models of perception upheld in cognitive psychology and the core concepts of Steiner's theory of knowledge (or idea of cognition). That being said, the ongoing acceleration in scientific understanding of the nervous system tends to favor physical/physiological explanations of cognition and perception, and the top-down “mental processes” alluded to in the model presented below (see Figure 3) are more and more equated with information

²¹ This is comparable to an experience we can have when reading a text. Sometimes we read the words without really grasping their meaning. In that case we read the text, but there is no comprehension of its content.

processing in the nervous system and replaced by detailed descriptions of the areas in the brain where such processing is believed to take place. Nevertheless, I am going to use a chapter on perception authored by Philip Zimbardo and Richard Gerrig and first published in 1996 as a representative of the understanding of perception in (relative) contemporary cognitive psychology (Zimbardo & Gerrig, 1996a). The chapter has been reproduced in the book *Foundations of Cognitive Psychology: Core Readings* (Zimbardo & Gerrig, 2002). The chapter was originally published in the fourteenth edition of *Psychology and Life*—an introductory textbook in psychology for undergraduate students authored by Zimbardo and Gerrig (Zimbardo & Gerrig, 1996b). While I am writing this study, *Psychology and Life* is in its twentieth edition, now authored by Gerrig alone, without Zimbardo (Gerrig, 2013). The chapter *Sensation and Perception* in the newest edition still covers the same core concepts that were covered in the chapter *Perception* from 1996. Philip Zimbardo has become co-author of another introductory textbook for undergraduate psychology students: *Psychology: Core Concepts* (Zimbardo et al., 2017). This book, which is in its eighth edition, also has a chapter titled *Sensation and Perception*. This chapter is organized in a slightly different manner, but still covers the same core concepts covered in Gerrig and Zimbardo in 1996. The model is also referred to in other much-used undergraduate textbooks of psychology and cognitive psychology (e.g. Eysenck & Keane, 2020; Nolen-Hoeksema et al., 2009).

Substantiated by clinical examples, by experiments, by experiences with ambiguous images and reversible figures, by a sample of earlier theories about perception, and illustrated with a description of the processes believed to influence the perception of depth in vision (among others), in their chapter Zimbardo and Gerrig present perception as the processing of information. They identify two types—or directions—of processing: “bottom-up” or “data-driven” processing, and “top-down” or “conceptually driven” processing. Bottom-up processing is depicted as the processing of information originating in the sensory processes, it continues while the transduced sensory signals are further processed in the central nervous system. Top-down processing are described as originating from so-called “higher mental processes” (see Figure 3). In their own words Zimbardo and Gerrig define these two forms of information processing as follows:

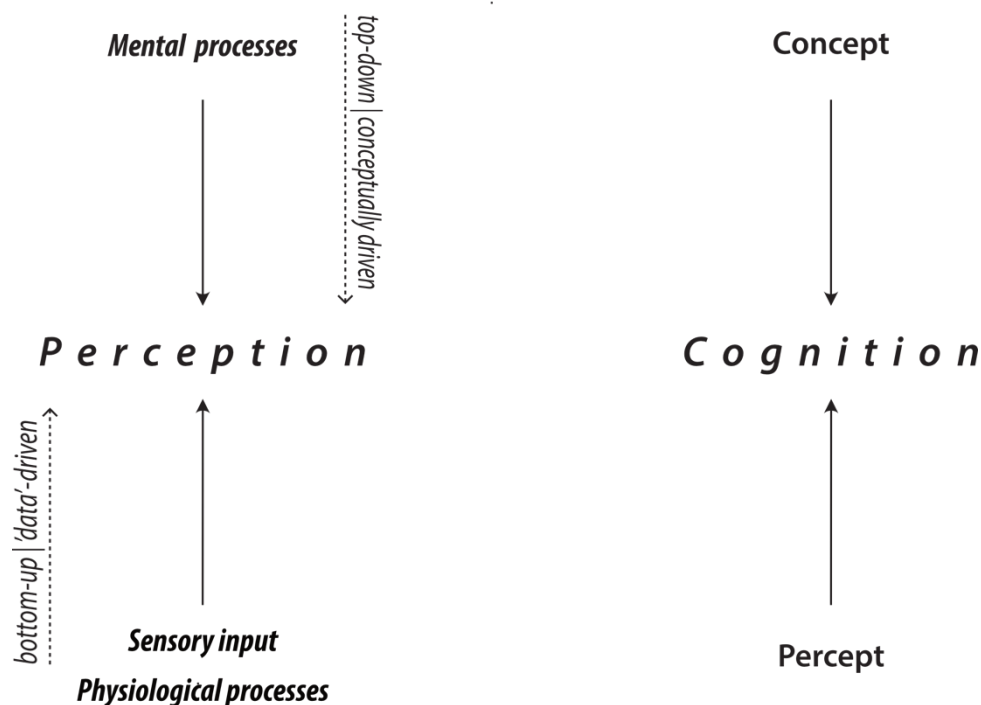
Bottom-up processing occurs when the perceptual representation is derived from the information available in the sensory input. Top-down processing occurs when the perceptual representation is affected by an individual’s prior knowledge, motivations, expectations, and other aspects of higher mental functioning (Zimbardo & Gerrig, 2002, p. 140).

Comparing the model presented by Zimbardo and Gerrig with Steiner’s idea of cognition

Figure 3 compares a simplified and slightly adapted diagram of the model presented by Zimbardo and Gerrig with the core concepts of Rudolf Steiner’s *idea of cognition* as presented in the previous section. Despite significant differences, even a cursory glance will reveal the overall similarity of the two diagrams. This similarity is no coincidence. Even though Zimbardo and Gerrig refer to *perception* while Steiner refers to *cognition*, their areas of investigation overlap considerably. In both models perception/cognition is basically described as the synthesis of sensory/experiential and conceptual “input”.

Figure 3

Comparing cognitive psychology’s model of perception with Steiner’s idea of cognition.



Note: The diagram on the left is a simplified version of a diagram presented by Zimbardo and Gerrig. The full version of their diagram can be found in: Zimbardo, P. G., & Gerrig, R. J. (2002). Perception. In D. J. Levitin (Ed.), *Foundations of Cognitive Psychology: Core Readings* (p. 140). MIT Press. The same diagram is still used in the latest edition of the chapter, now reproduced in color: Gerrig, R. J. (2013) *Psychology and Life* (20th edition) (p. 82). Pearson. The diagram on the right is a schematic representation of the core concepts of the idea of cognition in the early epistemological works of Rudolf Steiner presented in the previous section.

If we ignore for a moment the reliance on physical and physiological explanations, the following quote from the recap at the end of Zimbardo and Gerrig’s chapter not only summarizes their take on the main processes involved in perception, it also refers to key cognitive activities such as organization, identification, and recognition, which are very

similar to activities that Steiner ascribes to thinking:

Your perceptual systems do not simply record information about the external world but actively organize and interpret information as well. Perception is a three-stage process consisting of a sensory stage, a perceptual organization stage, and an identification and recognition stage. At the sensory level of processing, physical energy is detected and transformed into neural energy and sensory experience. At the organizational level, brain processes organize sensations into coherent images and give you perception of objects and patterns. At the level of identification, percepts of objects are compared with memory representations in order to be recognized as familiar and meaningful objects. The task of perception is to determine what the distal (external) stimulus is from the information contained in the proximal (sensory) stimulus. (Zimbardo & Gerrig, 2002, p. 185)

The examples, experiments, clinical experiences etc. used by Zimbardo and Gerrig to substantiate the model of perception they present could also serve to substantiate and illustrate the idea of cognition presented by Steiner. A good example are the use of ambiguous images. Zimbardo and Gerrig give a number of examples of such images. They present the Necker cube, the so-called duck/rabbit picture from Gestalt psychology, and also a very blotchy picture on which a Dalmatian can be recognized. With these images they try to demonstrate the role of top-down processing in organizing the sensory information in such a manner that correct “interpretation” becomes possible. They conclude:

One of the most fundamental properties of normal human perception is the tendency to transform ambiguity and uncertainty about the environment into a clear interpretation that you can act upon with confidence. In a world filled with variability and change, your perceptual system must meet the challenges of discovering invariance and stability. (Zimbardo & Gerrig, 2002, p. 142)

Bortoft (1996) and Brady (posthumous) use ambiguous images to illustrate Steiner’s idea of cognition.

Theoretical assumptions

Although Zimbardo and Gerrig’s explanation of the mechanisms behind the recognition of ambiguous images are more or less congruent with Steiner’s idea of cognition; and although many of the examples, experiments and clinical experiences Zimbardo and Gerrig present support Steiner’s findings, the *assumptions* on which the mechanisms underlying Zimbardo and Gerrig’s model are based fall dramatically short of Steiner’s criteria for investigating cognition. As described in the previous section, when Steiner

developed the *idea of cognition* he first emphasized the necessity to exclude all assumptions and theories about cognition, because assumptions and theories are already the result of cognition and make it impossible to approach cognition unbiased. The core-assumption of the model presented by Zimbardo and Gerrig is the neuro-physiological basis for cognition. This assumption pervades the whole chapter. Whereas Steiner approaches the pre-cognitive *experience* of the given as unbiased as possible, for Zimbardo and Gerrig experience has become essentially synonymous to neuro-physiological processes. For example, in the citation quoted earlier (Zimbardo & Gerrig, 2002, p. 185), sensory experience is virtually equated with the “neural energy” into which physical energy is believed to be transformed.²² In the same citation *brain processes* are conferred the power to *organize* sensations into *images*, in which patterns and objects are *recognized*. The link between these cognitive abilities and the physical/physiological processes believed to underly them is not only assumed without being substantiated; describing the physiological processes is considered a sufficient explanation. This tendency to explain “mental processes” by merely describing the neurological processes believed to underly them, is even stronger in the newer editions of the chapter (Gerrig, 2013; Zimbardo et al., 2017).

Elsewhere in the chapter, Zimbardo and Gerrig use the term “mental computation” to describe part of the process of organization inherent in perception. The term is not used to refer to some form of mental counting or arithmetic, it rather appears borrowed from artificial information processing terminology and seems to suggest that the processing involved in perception is of a nature that can be compared to the processing of information in a computer—hence “computation”. Again this implies that mental processes are equated with physical processes—in this case signal processing in networks of neurons. Here follows a quote in which the term “computations” is used (here without the adjective “mental”) and linked to “experience”:

By now, it should be clear that there are many sources of depth information. Under normal viewing conditions, however, information from these sources comes together in a single, coherent three-dimensional interpretation of the environment. You experience depth, not the different cues to depth that existed in the proximal stimulus. In other words, your visual system uses cues like differential motion, interposition, and relative size automatically, without your conscious awareness, to make the

²² Zimbardo and Gerrig probably use the term “neural energy” instead of (for example) neuro-physiological processes to adhere to the law of conservation of energy (a fundamental law of physics).

complex computations that give you a perception of depth in the three-dimensional environment. (Zimbardo & Gerrig, 2002, p. 171)

Here, the “computations”, which are thought to be of a “complex” nature, are presumed to be carried out automatically by the “visual system” and do not become a conscious experience. With the “visual system” they presumably mean all neural networks linked to visual processing, ranging from the neural part of the sense organs (the retinas in this case) to specific areas in the brain. In the later editions of the chapter (Gerrig, 2013; Zimbardo et al., 2017), the emphasis shifts almost entirely to an exploration of this neurological visual system. As stated, the experience of depth of vision is considered a result of “complex computations”. Yet, how processes in neural networks could lead to experience *at all*, remains entirely unclear and this question is never even raised.

These are just a few examples of the conflation of two realms or levels, which, on the basis of sound epistemological reasoning should not be considered one: the physical/physiological level and the experiential level. The experiential level is directly accessible to thinking, whereas the connection of the physical/physiological level to direct experience is not—it is strictly theoretical. As already stated, in the newest renditions of the chapter Gerrig, as well as Zimbardo and his co-authors focus even stronger on describing physical and physiological processes. Unfortunately, this epistemological carelessness is widespread in cognitive psychology.

Although it is nowhere stated explicitly in Gerrig’s and Zimbardo’s chapter from 1996, physical/physiological processes are treated as the basis on which perception unfolds. This goes for the information side²³, as well as for the conceptual side of the process. The mental processes believed to inspire the top-down/conceptually driven “input” in the process of perceiving are further specified as “knowledge”, “previous experience”, “expectations”, “motivation”, etc. They are believed to somehow reside in the central nervous system. Most of these higher mental functions are closely related to what tends to be categorized as memories—also believed to reside in the nervous system. Once again, these assumptions are implicit, they are nowhere stated explicitly in the chapter (they are however stated more explicitly elsewhere in Zimbardo and Gerrig’s books).

²³ For clarity, the “information” is considered to originate as physical vibrations and is thought to be transformed into (chemical/electric) nerve signals in the sense organs. Cognitive scientists use the term *transduction* for this transformation from sense stimulus to nerve signal (e.g. Zimbardo, Johnson, & McCann, 2017, p. 77). As nerve signals the information is believed to travel to, and undergo “processing” in specific areas of the brain.

Representation in cognitive science

In cognitive science the concept of *representation* plays a central role (e.g. Bechtel, 2008; Perner, 1993; Ramsey, 2007; Vignolo, 2007). In his chapter “Representations and Mental Mechanisms” William Bechtel gives an overview and analysis of the state of the use of the concept of representation in the cognitive sciences. He begins the chapter as follows:

Representation is one of the most widely invoked terms in both cognitive science and neuroscience and is much discussed in philosophical accounts of these fields. One of the clearest ways of differentiating the cognitive tradition from its behaviorist predecessor in psychology is to note that cognitive theories invoke representations ... The motivation for introducing representations into accounts of mental processing follows from viewing the mind/ brain as a set of mechanisms for controlling behavior and, in the case of more complex organisms, performing a variety of *off-line* cognitive tasks that relate them to objects and events in the world around them. As discussed ... this requires conceiving of the mind/brain as a set of information-processing mechanisms. Central to the idea of an information-processing mechanism is that states within the mechanism serve to carry information about objects or events external to it. The term *represent* characterizes the relation between states within the information processing system, which [earlier] I referred to as the *vehicle* of representation, and external objects or events, referred to as the *content* of the representation. The term *representation* refers to both the vehicle and its content. (Bechtel, 2008, p. 159)

Bechtel observes that humans use language, images and symbols to communicate ideas, and he refers to them as *external representations*. They are external because they are expressed externally in sound, writing, or in the form of pictures. The words, images and symbols “designate something else” (Bechtel, 2008, p. 160), they *represent* ideas. The words, images and symbols are the *vehicles* of representation, while the *ideas* are the content that is being represented. In other words, the words, images and symbols are one category of “things”, that point towards something else: ideas. What *is being* communicated are the ideas, but they are communicated “*through*” the representations. Bechtel doesn’t analyze the merit of this observation, nor does he try to explain how it is possible to communicate ideas through “something else”. He merely uses this observation to point out that cognitive scientists have adopted this image (of the use of external representations to communicate ideas) as a model for *inner* representation. Most mental mechanisms involve a model of internal representation. Bechtel explicitly points out that such models are of hypothetical

nature:

It is important to note that using external representations with which we are already familiar to characterize internal representations within our mind/brain involves advancing a theoretical hypothesis as to how these mental mechanisms operate. Cognitive scientists and neuroscientists are not simply reporting on internal representations they have observed. Rather, they are proposing that there are such things as internal representations and that these work much like the external representations which we, as humans engaged in social practice, use in our daily lives. (Bechtel, 2008, p. 160)

In his analysis Bechtel differentiates between the manner in which cognitive scientists, neuroscientists and connectionists have used the model of representation. He also analyses how successful they have been in establishing a causal connection between the vehicle of representation and its content. Neuroscientists map internal representations to different areas of the brain. Their research has shown that different areas of the brain appear involved in different aspects of cognition—e.g. perceptions are believed to be processed in specific regions of the brain. The nature of the representations they hypothesize are mostly iconic (meaning that the structure of the vehicle is similar to the structure of the content), while the causal relationship between vehicle and content is straightforward. Cognitive scientists have predominantly used logical and linguistic models to model internal representations. Here the structure of the vehicle does not resemble its content, while the causal relationship between the two is less obvious, as the focus is more on how vehicle and mechanism are related than on how vehicle and content are related. In connectionist models the relationship between the vehicle of representation and its content is even further obscured. In connectionist models representations are modeled as distributed throughout the neural network. Bechtel also mentions a group of cognitive scientists that have adopted *dynamical systems theory* (DST). This group proposes that taking account of the dynamics of a system can explain interactions within the system without having to rely on the concept of representation.

Bechtel offers an interesting overview, and what his overview and analysis make clear is that mechanical models of mental processes haven't really overcome Descartes' realization that the higher mental processes cannot be sufficiently explained by mechanical models. In particular, no mechanical model can really explain a mental *experience*. Mechanical models merely explain mechanisms, and mechanisms operate on a single level—be it physical or informational. Neuroscientists model neurological activity by investigating it at the level of

physics and chemistry. Both perception and behavior are explained at this level. And the internal representations are of the same nature. Findings on this level appear *correlated* to mental experiences. This correlation is often treated as an explanation. But the explanatory gap between physical and chemical occurrences in the interaction between the world and nervous systems on the one hand, and mental experiences on the other hasn't become smaller when compared to Descartes realization that he couldn't imagine a mechanism to explain higher cognitive abilities.

Logical and linguistic models of cognition face a similar problem. Finding logical and linguistic structures that can be used to create artificial intelligence and to explain the formal structure of representational thinking doesn't bridge the explanatory gap between logical or linguistic structure and *meaning*. Meaning is only accessible through understanding, and understanding resides on a different level than the level on which logical and linguistic structure models operate. This has been highlighted by John Searle (1980) in his "Chinese room" argument (to which Bechtel also refers). In this thought experiment an English person who doesn't understand Chinese is given several notes in Chinese and instructions on what to do with the Chinese characters on some of the notes. The instructions are of such quality that, by applying them, the person—unwittingly—answers a number of questions in Chinese. To someone who understands Chinese the answers make complete sense; however the person that answered the question understands nothing of the content, he merely followed the instructions. The person also answers a number of questions about notes in English. Here he doesn't need instructions and he understands everything. Searle concludes:

In the Chinese case I have everything that artificial intelligence can put into me by way of a program, and I understand nothing; in the English case I understand everything, and there is so far no reason at all to suppose that my understanding has anything to do with computer programs, that is, with computational operations on purely formally specified elements. As long as the program is defined in terms of computational operations on purely formally defined elements, what the example suggests is that these by themselves have no interesting connection with understanding. They are certainly not sufficient conditions, and not the slightest reason has been given to suppose that they are necessary conditions or even that they make a significant contribution to understanding. ... [W]hatever purely formal principles you put into the computer, they will not be sufficient for understanding, since a human will be able to follow the formal principles without understanding anything. (Searle, 1980, p. 418)

Although Searle can't describe what "understanding" is (as he admits in his paper) and although he maintains that understanding is a function of the biological human brain, his conclusion resonates strongly with what I referred to as "shadow thinking" in the penultimate section. Here I present his argument because I experience his conclusion as consistent with my observation that *manipulating (re)presentations* and *understanding* represent two distinct levels of cognitive functioning.

In connectionist models the mechanism itself has become intangible and can't be easily comprehended. The representations have suffered a similar fate—they are considered to be distributed throughout a network. The gap between mechanism/representation and mental experience has not become smaller in this model. Models based on DST referred to by Bechtel operate mainly on a simple physical level (where the cognitive system is extended over body, nervous system and environment), and as yet don't seem to include or even imply mental experiences or understanding.

In short, the explanatory chain invoked by mechanical models operates on one level only. This level can be physical or more abstractly structural (conceptual/information-related). When external representations such as words, images or symbols are used to communicate ideas, the vehicle (the representation) becomes a portal to something at another level of experience (an idea). Cognitive activity is required to use the portal and to experience the content through it. The internal representations hypothesized in mental mechanisms basically represent a relationship between one aspect of the level at which the mechanism operates with another (information, either on a biophysical or on a more abstract level) is passed along from one part of the mechanism to another part. This relationship can be fixed or dynamic, but the effect of the representation is restricted to the level on which the mechanism itself operates—it doesn't go beyond it. Internal representations as imagined in the different areas of the cognitive sciences are no portal to another level of experience. Furthermore, no cognitive activity is required to access them. They are merely *part* of a (hypothesized) cognitive activity: the activity modeled by the cognitive mechanism to which the representations belong.

Representations, presentations and understanding

Bechtel observes that the internal representations put forward in the cognitive sciences are modeled after external representations, and with external representations he refers to the words, images, symbols (etc.) we use to communicate ideas. In the penultimate section I have proposed that it is more apt to refer to the mental images and terms by which we retain or recreate parts of our experience as presentations, rather than representations. For

me, the words, images and symbols Bechtel refers to as external representations are the outward *expression* of mental presentations, and I still don't consider it apt to refer to them as *re-presentations*. *Designating something else* and *expressing something* are of a different quality. Like the mental presentations, the words, images, symbols etc. we use to express them *directly* connect to the *meaning* of the concepts and ideas we try to communicate. They don't represent this meaning indirectly. They are anchors of, or portals to the meaning of the concepts and ideas connected to them; they are not standing in for those ideas. Through them we can directly access understanding. Let me give a personal example that can serve to explain this point, and at the same time serve as an illustration of most of the ideas covered so far in this study.

Thirty-four years ago I worked as a temporary social care worker in a unit with clients with (mostly) severe mental disabilities. During three consecutive nights I had the same dream involving one of the clients. In the dream this client asked me to help her with completing her thesis. After having experienced this dream for the third time, I realized what it meant. This realization happened while I was working in the unit on the day after the third night I had the dream. I was talking about the dream to a colleague and friend. And while I told him the dream I was struck by the sudden realization that the "thesis" in the dream meant the client's biography—her life. She was asking me to help her with her life—with her unfolding biography. As I realized the meaning of the dream, from deep within me surged a powerful "yes" to her request. On the following day I changed my temporary contract to a permanent contract and shortly afterwards I became this client's "mentor"—the care worker responsible for her care.

She died about two years later, after surgery. In the night after her passing, I woke up with a fairy tale. More accurately, as I woke up I found myself *creating* the fairy tale. I told this fairy tale during her funeral service, a few days later. In the same year I also researched and wrote her biography—as an assignment for the training for social care worker I was involved in. Until this day, I feel that the fairy tale, conceived in the night after her passing, conveys a deeper understanding of the essence of the life of this client than the biography I wrote later that year.

Both the dream and the fairy tale came as messages from the night and conveyed understanding. More specifically the dream presented a question in the form of a metaphor. The thesis that presented itself in the dream was a metaphor for a larger project: the life of this client. It was impossible for her to ask me such a profound question in person—she simply lacked the ability to formulate and express it. The way I understand what happened is

that I had opened myself up enough to her to *perceive* her question. The perception of the question presented itself to me in the form of the dream. Still, I needed to hear it repeated three times and express the way in which it presented itself to me to a friend, to be able to understand what it meant. This understanding was much more than simply understanding what the metaphor meant. The understanding included understanding the meaning of the metaphor, understanding the question, and understanding the client—all joined together in one sudden realization. In the language of Rudolf Steiner, the percept was hearing the question, the concept was its meaning and the act of cognition was this threefold understanding. The dream image, and particularly the metaphor of the thesis were presentations. They did not re-present the question, the meaning or the threefold understanding—they were the manner in which I perceived the question and, once perceived, they became a portal to understanding.

The fairy tale was the form in which my understanding of the completed life of this client presented itself to me. Once I received/created it (it felt like both) I expressed it by telling the fairy tale during her funeral service. As I conceived, and later told the fairy tale, I was conscious of the meaning of its metaphorical images, they anchored my understanding of the life of my client. Yet, neither my perception, nor my understanding of the life of my client were re-presented by the images.

Subjectivity and objectivity

I would now like to reflect on the concepts “subjective” and “objective”, and “subject” and “object”, and on their relation to the act of cognition. The words “subjective” and “objective” have several, sometimes almost contradictory meanings, and to be able to use the concepts in a clear manner it is important to be clear about the intended meaning. For this reason I would like to draw the reader’s attention to two instances in which Rudolf Steiner mentions subject and object, and subjective and objective in *Die Philosophie der Freiheit*. I will use his statements to clarify the meaning I propose to give these concepts. Presently the term “subjective” is often used in the following meanings: “based on or influenced by personal feelings, tastes, or opinions”, or “dependent on the mind or on an individual’s perception for its existence” (“Subjective,” 2015). “Objective” is often used to mean almost the exact opposite: “not influenced by personal feelings or opinions in considering and representing facts”, or “not dependent on the mind for existence; actual” (“Objective,” 2015). As I see it, these meanings are the source of much confusion in the manner in which science—and particularly psychology as a science—are conducted presently.

So let us look at the two excerpts from the first part of *Die Philosophie der Freiheit* in

which Steiner states what the terms “subject” and “object” refer to and what “subjective” and “objective” refer to. After the preceding sections of this study, the context in which the terms are presented should be reasonably understandable to the reader and perhaps even illuminate some parts of what was discussed earlier. Here is first the excerpt in which Steiner clarifies what he means with “object” and “subject”.

This is the moment to move from thinking to the being who thinks. For it is through the thinker that thinking is linked to observation. Human consciousness is the stage where concept and observation meet and are connected to one another. This is, in fact, what characterizes human consciousness. It is the mediator between thinking and observation. To the extent that human beings observe things, things appear as given; to the extent that human beings think, they experience themselves as active. They regard things as *objects*, and themselves as thinking *subjects*. Because they direct their thinking to what they observe, they are conscious of objects; because they direct their thinking to themselves, they are conscious of themselves, they have *self-consciousness*. Human consciousness must necessarily at the same time also be *self-consciousness*, because it is a *thinking* consciousness. For when thinking directs its gaze toward its own activity, it has before it as its object its very own being, that is, its subject. (Steiner, 1995b, pp. 51-52; in the German version on pp. 59-60)

And now Steiner’s characterization of “subjective” and “objective”.

Only what is perceived as belonging to the subject can be characterized as subjective. To build the link between the subjective and the objective does not pertain to any real process in the naive sense—that is, to any perceptible event; only thinking builds this link. Thus, for us is objective, what to perception appears as lying outside the perceiving subject. (Steiner, 1995a, p. 99)

Thus, a *thing* (“einen Gegenstand”), to the extent that it is *observed*, appears to the human being as *given* and is regarded (“betrachtet”) (as) an *object*. And, to the extent a human being *thinks*, they appear to themselves as *active* and regard themselves (as) the thinking *subject*. Then, that what is perceived as *belonging to the subject*, is *subjective*. And finally, what the perceiving subject perceives as outside itself, is *objective* for it.

To fully appreciate their significance, these statements (or observations) need to be contemplated and compared with direct, first-person experience. As *concepts*, subject and object are the *conceptual content* belonging to the *observation of how* (the manner in which) we experience *what observes* or *what thinks* (the observer, the thinker—thus that what is *actively* observing, thinking), and that what is *observed*. *How* we experience the observer, the

thinker, is as *ourselves*, as “I”—i.e. as *the first person*. How we experience that what is observed is as “it” (grammatically the third person). I can only *directly* refer to myself as subject. When I refer to someone else as a subject, I do so without the direct subject-experience—then the subject I refer to is actually an object to me (it is not experienced as being one with me, the perceiving subject). When I refer to a subject, I refer to what is *only* present as first-person experience. The subject is *that what is active* in the first-person experience. This meaning comes close to the following meaning for “subject” listed in Merriam-Webster dictionary: “the mind, ego, or agent of whatever sort that sustains or assumes the form of thought or consciousness” (“Subject,” n.d.). Here, Merriam-Webster defines subject in an objective manner—the definition of subject is given from an outsider perspective, which makes it an object. When referring to a subject as an object we do *not* experience the most important quality of the subject directly. The subject is the ultimate insider, it *is* what actively experiences. The active experience itself is what Steiner refers to as thinking (yet, thinking itself is *not* subjective—the designation of subjective is *made* by thinking). The quality that is absolutely unique to the subject, is the first-person experience. Every human being is a “first-person” who experiences directly.

It might seem odd to pay so much attention to such an all-pervading experience, but, as pointed out above, *describing* the subject makes it an object, which is precisely not how it is experienced. The first person is “I” (what the definition listed in Merriam-Webster alludes to when it refers to “mind”, “ego”, and “agent”); therefore, first-person experience is the active, direct manner in which the I experiences. I should write, first-person experience is the active, direct manner in which *I* experience, because this is the only way I can state it so that I do(es)n’t become an object. Only when I refer to myself as I is “I” not an object. First-person experience is how I experience. I am present in the experience; the experience is present in me. It is I, *in my actively experiencing quality*; it is I *actively experiencing*. I and my direct experience are not separated (although I can bring *the experience of I* to the foreground of my active experience, when I focus on the experience of I). Rudolf Steiner writes the following with regards to (the) “I”:

The little word “I” as used in the [English] language, is a name that distinguishes itself from all other names. To who reflects appropriately upon the nature of this name a deeper understanding of the human being becomes accessible. Everyone can equally use whatever other name to refer to the thing with which that name corresponds. Everyone can call the table “table”, and the chair “chair”. This is not the case with the name “I”. Nobody can use it to refer to someone else; everyone can only call themselves

“I”. Never can the name “I” reach my ear from somewhere else when it indicates me. Only from within, only through itself can the soul refer to itself as “I”. (Steiner, 2003b, p. 49)

All this is no secret to any human that is able to read this. It is one of the most basic and intimate experiences almost every human being has. To themselves every human being is the subject. However, perhaps because this experience *is* so basic and all-pervading, we mostly simply appear to take it for granted and overlook its significance. When we engage with the *content* of our experience we (partly and momentarily) forget ourselves as subject.

Steiner defines as *subjective* what is *perceived* as *belonging to* the subject (Steiner, 1995a, p. 99). To me my identity (I) and the source of my first-person experience (which is me as the subject) fall together—I experience them as identical. In other words, I *identify* with the subject. What I perceive as *belonging to* what I identify with, I actually *also* identify with. However, I only truly identify with it as long as I perceive it as belonging to—or being part of—me. When I direct my attention to aspects of my immediate experience I lift particular aspects out of the overall experience and observe them (as described by Steiner during his investigation of the act of cognition). Observing aspects of what I experience means that these aspects become objects. I can also direct my attention towards aspects of my immediate experience that I perceive as belonging to me. This very act of directing attention to what I, until then, perceive as an aspect of me, radically changes my relationship with it. As I direct my attention to it and observe it, it becomes an object and is no longer perceived as belonging to me. As long as I observe it, it is not subjective (in the sense of being perceived as belonging to the subject).

At the start of the act of cognition aspects of the immediately given are lifted out of the overall experience and observed. It is here that the distinction between object and subject arises. The act of cognition moves from this first separation, in which an aspect of the given is objectified, to the subjective experience of understanding and from there to the union of perceived object with intuited meaning through thinking. In Donna Williams’ writings about her early experiences, the dynamic nature of this dance between object and subject is clearly visible when she describes the stages of “no self, no other”, “all self, no other”, “all other, no self”, and “simultaneous self and other” (Williams, 1998, Chapter 2).

It should be noted that thinking *itself* is neither subjective or objective because it is thinking which brings forth these concepts. Steiner observes:

[W]e must not overlook that it is only with the help of thinking that we can define ourselves as subjects, and contrast ourselves to objects. Therefore, thinking must

never be regarded as a merely subjective activity. Thinking is *beyond* subject and object. It forms both of these concepts, just as it does all others. Thus, when we as thinking subjects relate a concept to an object, we must not regard this relationship as something merely subjective. It is not the subject that introduces the relationship, but thinking. The subject does not think because it is a subject; rather, it appears to itself as a subject because it can think. The activity that human beings exercise as *thinking* beings is therefore not merely subjective, but it is a kind of activity that is neither subjective nor objective; it goes beyond both these concepts. I should never say that my individual subject thinks; rather, it lives by the grace of thinking. Thus, thinking is an element that leads me beyond myself and unites me with objects. But it separates me from them at the same time, by setting me over against them as subject. Just this establishes the dual nature of the human being: we think, and our thinking embraces ourselves along with the rest of the world; but at the same time we must also, by means of thinking, define ourselves as *individuals* standing over against *things*. (Steiner, 1995b, pp. 51-53)

Theory versus direct experience

Subjectivity, objectivity and theory in psychology

Particularly in psychology there is a strong division between what are considered qualitative and quantitative approaches. Very generally, qualitative approaches are considered to deal with subjective reality, while quantitative approaches are considered to deal with the more objectifiable (and thereby measurable) aspects of human reality. This division rests on the view that what we perceive as our inner world—which includes thinking, feeling, experience—is subjective, while what can be observed as behavior is objective. Again very generally, in this division the inner, subjective world is considered to be constructed dependent on the subject's interpretation of the environmental forces and their perceived influence on the self. In many of the qualitative approaches the subjective world is the object of research, and the subjectivity of the researcher is taken into account in the research. Often the motivation for the particular interpretation and the particular attribution of meaning that leads to specific constructs are investigated and the interpretation and attribution of meaning by both the researcher and their subject are analyzed and described. Such descriptions are rich in subjective meaning and interpretation, but often don't rise above it. The quantitative approaches focus on what can be measured, and on making aspects of the inner world measurable by linking it to observable behavior—often in the form of *responses*, but also through physiological measurements. Theories and hypotheses link the measured

responses and physiological data to the inner processes and motivations assumed to cause them. Here the approach stands or falls with the quality of the underlying theory and hypotheses and on how the measurements are interpreted. In the end this approach doesn't rise above the theories that underly it.

Implicit theories

As I hope to have made clear in this study, the problem with the conceptualizations of cognition in cognitive science is that the point from which cognitive science departs is not direct experience of cognition, but what is *believed to be true* (or *generally accepted to be true*) *about the basis of reality*. Direct experience of cognition—awareness of cognition-as-process as it happens, *thinking*—is the most certain basis (or departure point) a human being can start from; all *ideas* about cognition, all *ideas* about reality's basis, and all *ideas* about how reality's basis relates to cognition are *results* of cognition—they are cognitions-as-product. Because they are built on other theories and not on direct experience, conceptualizations of cognition as put forward by cognitive science have to remain theory. Since the more fundamental theories at their basis are not questioned, and since the relationship of cognition to these theories is not clear and cannot be grasped through anything remotely close to direct experience, in cognitive science cognition as a theory is not closed and has loose ends. Attempts are made to explain specific experiences on the basis of the theory, and specific experiences are used to illustrate the theory. But investigation of experience is not what led to the theory—the theory was not derived from investigating direct experience.

Many theories on which cognitive science's conceptualizations of cognition are build are materialistic in nature. These theories often remain implicit, as cognitive scientists do not consider it their task to question, explain, or justify them. Probably rightfully so as far as it concerns theories brought forth by the natural sciences, because such theories go beyond the remit of cognitive science. Nevertheless, cognitive scientists should question the appropriateness of materialistic theories to serve as basis for understanding cognition. Presently, experience is essentially considered an *effect* of physical, biological processes. Apart from in phenomenological approaches, direct experience is not investigated—at least not *directly*. For these reasons, conceptualizations of cognition, such as the model of perception presented by Zimbardo and Gerrig discussed earlier, appear removed, flat and disconnected. At first glance they may appear interesting, particularly because of the many illustrations that link them to actual experiences. However, upon further investigation they lack depth and a firm connection with direct experience. They are not derived from direct

experience, they are certainly not congruent with all aspects of direct experience, and they can't give a satisfactory explanation of how direct experience is related to the physical and biological processes believed to give rise to it. They don't even seek such an explanation.

The “cycle of enquiry”

In Zimbardo and Gerrig's chapter, the theory (the theoretical model of perception) is the starting point, not the outcome or conclusion of an investigation. All examples, experiences and experiments mentioned are meant to give substance to the theory. Thus, the theory—or the theoretical model—is central. Again, this is rather common practice in (cognitive) psychology. Scientific enquiry in contemporary psychology mostly revolves around theory development. It is interesting to see how undergraduate psychology students are introduced to scientific enquiry. Such introductory lessons prime their understanding of scientific research as it is used in psychology. In the first chapter of their textbook for undergraduate psychology students Zimbardo et al. (2017) define a scientific theory as an idea, or a set of ideas, that is able to a) *explain* the facts and that b) is *testable* (Zimbardo et al., 2017, p. 18). The goal of scientific research—they state—is to test a theory. Zimbardo et al. describe scientific research as consisting of four steps: 1) *developing a hypothesis*; 2) *gathering objective data*; 3) *analyzing the data* (they actually write results instead of data, but in scientific research results are usually the outcome of data analysis); and 4) *publishing, criticizing and replicating the results* (Zimbardo et al., 2017, pp. 18-20). Nolen-Hoeksema et al. (2009) present a simpler model of scientific research, consisting of only two steps: “(1) generating a scientific hypothesis and (2) testing that hypothesis” (Nolen-Hoeksema et al., 2009, p. 18). A scientific hypothesis, they state, can be arrived at in many different ways, however “the most important source for scientific hypotheses ... is often a scientific theory, an interrelated set of propositions about a particular phenomenon” (Nolen-Hoeksema et al., 2009, p. 19). When I was an undergraduate psychology student one of the first things I was taught was what was called the *cycle of enquiry*. Phoenix and Thomas (2002) explained how the cycle of enquiry forms the basis for research in contemporary psychology, and that it revolves around *theory development*. According to the model they presented, which described the basic elements of scientific research, the cycle of enquiry consists of four elements: *questions, claims, data/evidence, and evaluation*. Three of these elements correspond to the steps described by Zimbardo et al. (2017). Phoenix and Thomas outlined that in psychological research the cycle of enquiry starts by framing appropriate, answerable *questions*. Answers to these questions are formulated in the form of *claims* (another word for hypotheses). It should be noted that both questions and claims (hypotheses) are informed by

the theories at the center of this cycle of enquiry.²⁴ To assess the claims, *data* or *evidence* are required. Such data/evidence are produced through empirical investigation, e.g. by conducting experiments. At the final stage of the cycle of enquiry, the data/evidence are *evaluated* in order to decide whether the data support or disprove the claims or hypotheses. Support or disproof of a claim may affect the theory at the center of the cycle—it may support or disprove the theory, or it may call for an adjustment of the theory. Evaluation of the data also tends to lead to new questions. These questions then lead to new cycles of enquiry. As may be clear from this brief description, the cycle of enquiry both *informs* and *is informed* by the theory (or theories) around which its elements revolve. All this basically means that theories and their development are considered central in most contemporary psychological research. Data/evidence do not lead to the theory—at least not directly. They rather serve the testing of the claims or hypotheses informed by the theory. The data strongly depend on the questions and hypotheses *informed* by the theory, as well as on the manner in which the testing of the hypotheses is set up. Therefore data/evidence—although required to be *objective* (see step 2 of scientific research as described by Zimbardo et al., 2017, mentioned above)—are not *neutral*. They are definitely not the *starting point* of the cycle of enquiry.

Goethean Science and psychological enquiry

Scientific enquiry informed by Steiner's theory of knowledge takes phenomena, not theory as its starting point. It is directly related to the idea of cognition described in Steiner's epistemological works. It consists of the observation of phenomena and of *allowing* thinking to bring forth the conceptual content that completes the perceptual content. The enquiry starts when thinking addresses the perceptual content.

In the language of contemporary science, perceptual content is pure observational "data". In the terminology used by Steiner in *Wahrheit und Wissenschaft* it consists of the aspects of the immediately given lifted out of the given by thinking. As we have seen, in *Die Philosophie der Freiheit* Steiner uses the term *percept* for this perceptual content. According to Steiner, percepts can result from engaging with outer as well as inner phenomena. As described earlier, according to Steiner's theory of knowledge, thinking engages with the

²⁴ Phoenix and Thomas present a diagram to represent their model of the cycle of enquiry. In this diagram, theory development is in the center. The four elements that make up the cycle of enquiry—i.e. questions, claims, data/evidence, and evaluation—are depicted as revolving around theory development. These four elements are connected to each other by arrows, indicating that one follows the other. In the diagram, theory development (in the center) and the four elements revolving around it are connected by two-way arrows, showing that the cycle of enquiry both informs and is informed by theory development (Phoenix & Thomas, 2002, p. 6).

percept in order to bring forth the content that forms the conceptual counterpart of the percept. Subsequently thinking unites the two in *cognition*.

We could say that the experiential (subjective) term for cognition is *understanding*, and in its more objectified form we call it *knowledge*. *Theories* are conceptual systems (consisting of networks of concepts and ideas) concerning the nature of, and the connections between observed phenomena. Like other conceptual content, they are brought forth by thinking. Like other conceptual content, ultimately theories are brought forth as a result of observing phenomena. Thus, although theories are—strictly speaking—formalized propositions, or assumptions, in scientific enquiry based on Steiner’s theory of knowledge they are informed by phenomena. In the cycle of enquiry as it is used in contemporary psychology *phenomena* do not feature. The closest we get to phenomena is in the “data” that empirical investigation produces. As stated above however, in that cycle of enquiry the data is strongly *dependent* on the theory, and the theory, not the phenomena are the starting point of the enquiry.

Steiner formulated his theory of knowledge while he was editing Goethe’s scientific work. This is no coincidence. In his scientific research Goethe basically used the method later described explicitly by Steiner. In remembrance of Goethe, this method is currently known as *Goethean science*, or also as *Goethean phenomenology*. It is mostly used to investigate external phenomena (see e.g. Bortoft, 1996, 2012; Brook, 2009; Edelglass et al., 1997; Lehrs, 1951; Maier et al., 2006; Seamon & Zajonc, 1998). But, as Steiner indicated (e.g. in *Die Philosophie der Freiheit*), it can also be used to investigate internal (i.e. mental) phenomena. Goethean science can therefore also be used to conduct psychological enquiry. In fact, due to the nature of many of the phenomena investigated in psychology, Goethean science’s emphasis on direct experience makes it particularly suitable for the investigation of mental phenomena. Currently there is a new interest in the investigation of mental phenomena that involves direct experience, particularly among a group of German researchers mentioned earlier.

Archetypal phenomena

At the beginning of this study I referred to law-based—nomological—models of explanation. One of the core objectives of the exact sciences is to discover universal ruling principles—universal laws or laws of nature—that operate in the phenomena we perceive (or infer²⁵). Such laws both explain and predict phenomena. In his introduction to the third

²⁵ Many of the phenomena that are studied in physics and chemistry are not perceptible, they are inferred. These inferences often arises from attempts to explain observable phenomena. Examples of imperceptible phenomena

volume of Goethe's scientific writings Steiner points out that such laws—and he uses the example of Newton's first law of physics, the law of inertia—are not *abstracted* from the world of phenomena that we observe. Like he explains in more detail in his dissertation, such concepts are freely brought forth by thinking and only then connected with the phenomena we observe (Steiner, 1987, pp. 265-266). He writes:

Everywhere the spirit strives to rise above the succession of facts that mere observation offers and reach the *intrinsic idea*. Science commences where thinking begins. In its findings lies, as ideational necessity, what to the senses only appears as a succession of facts. These findings only appear to be the final product ... In truth they are what must be considered the foundation of everything, in the entire universe. Wherever they appear before our observation is not important—because that doesn't determine their meaning. ... We can start wherever we want, if we exert our cognitive forces enough, in the end we will hit upon the *idea*. (Steiner, 1987, p. 265)

An idea (conceptual content) is brought forth by thinking, and this creation is a free act. However, an idea's *relation* to a phenomenon is not arbitrarily determined by thinking. Once thinking has brought forth an idea, its connection with phenomena can be uncovered—however, this connection is a *necessary* one. A phenomenon is something that appears to us in a particular way. When we discover the related idea, we are dealing with the essence of what appears—this essence is not particular, it has a universal quality. Appearances are what we *observe*, the essence we *intuit*, it is the concept, or the idea brought forth by thinking.

Steiner explains how in the world we observe every phenomenon is connected to other phenomena, and that these connections are also phenomena. Every phenomenon we face is connected to other phenomena in manifold ways—it is determined by many other phenomena. To understand a phenomenon, we must start by investigating its relationship with other phenomena. The connection with some phenomena is *necessary* for a phenomenon to occur, its connection with others may modify the phenomenon, but is not necessary for it to occur. We can therefore distinguish between necessary and not necessary (or coincidental) conditions. Phenomena that occur while only the necessary conditions are involved can be called "*original*" the other ones we can call "*derived*" (Steiner, 1987, p. 276). And here, writes Steiner, the task of science becomes clear, "it needs to penetrate the phenomenal world to the degree that it finds appearances that only depend on *necessary* conditions" (Steiner, 1987, p. 276). In these necessary conditions it finds the universal principles, or what are

include electro-magnetic waves, atomic and subatomic particles etc.

referred to as the laws of nature. Steiner refers to the elements that determine each other with necessity as *archetypal phenomena*. About his conclusion concerning the proper relationship between science and the world of appearances he writes the following:

In the [world of appearances] the phenomena occur generally in modified [or derived] form and therefore they are initially not understandable; in [science] the archetypal phenomena come to the forefront while the modified phenomena are considered as consequences. In this way the overall contextual relationship becomes understandable. The system of science distinguishes itself from the system of nature in that, in science, thinking establishes the connections between the appearances and makes them understandable. Science should never add something to the world of appearances, but only reveal the connections hidden in the appearances. (Steiner, 1987, p. 277)

And finally, Steiner describes how the essence of things manifests in different forms in the different realms of nature. In the manifestations that make up what we call the *inorganic* world, the conceptual content can only be found in what modifies the manifestations. The conceptual content remains completely outside the manifold manifestations and can be expressed in the form of laws—the laws we now as natural laws, or the laws of physics. Here an archetypal phenomenon has the form of an original law—i.e. a law that is not derivable from any other phenomenon. In the *organic* world, that what determines the manifold manifestations, no longer lies completely outside these manifestations. Concept and observation are not identical, but the conceptual content is not found outside what manifests, but as a principle that works from *within* it. This principle itself is not observable through the senses, but it determines the manifestations from within. In the life sciences this governing principle is referred to as *type*. Thus, type is the archetypal phenomenon in the organic realm. Finally, within the realm of human consciousness, the essence—in other words the conceptual content—occurs *in* conceptual form. In the self-conscious human mind, the concept—the essence—*itself* can be experienced and observed.

Steiner:

Natural law, type, concept are the three forms in which the essence is expressed.²⁶

Natural laws are abstract, stand above the manifest manifold, and occupy the inorganic natural sciences. Here idea and reality are completely separated. Type

²⁶ Steiner writes “in denen sich das Ideelle auslebt“. I have taken the liberty to translate “das Ideelle” with “essence”.

already unites both in one being. The essence comes alive within the manifest being²⁷, but it is not yet present as itself. It has to be *beheld* in manifested form in order to be contemplated. This is how it manifests in the realm of organic nature. The concept is present in an observable form. In human consciousness the concept itself is what is observable. Percept²⁸ and concept fall together. Here the essence²⁹ itself is beheld. This is the reason why on this level also the essential that manifests in the lower realms of nature but that remains concealed, can be revealed. (Steiner, 1987, pp. 283-284)

The dance of subjectivity and objectivity—understanding and presentation

Archetypal phenomena are not subjective realities. Types, concepts and ideas can be considered *as* “objective” as natural laws. It is the human *subject* that has the ability to understand, present and express—to *reveal*—the essence at work in and between the manifestations observed in the world of appearances. The natural laws, types, or—more generally—the governing principles within what have been called the organic and the inorganic realms of nature are beyond what can be designated as subjective and objective. We have designated them as natural law and type, and this designation comes from *understanding* these principles.

As *experience* understanding is purely subjective—in the act of understanding, understanding is experienced as belonging to the subject. When what is understood is made present in the form of a presentation, when it is expressed, it has been given a form that is relatively independent of the subject that understood. In this form it is observable and thereby objective. It can be approached by thinking in the same way as any manifestation in the world of appearances. It can be presented to others and they can use their thinking to understand it. Their understanding is also purely subjective. Subsequently, they can present and express their understanding, objectifying it once again. They can retain their objectified understanding in the form of a mental presentation, or express it and thereby present it to others. Their presentation and expression can differ from ours and that of others. Obviously the quality of the presentation matters, but true understanding is not contained within such presentations; understanding occurs only within the subject, and is always experienced as purely subjective. Many books are written to communicate the same concepts. Scores upon

²⁷ Here Steiner writes “Das Geistige wird wirkendes Wesen“. To remain consistent I have rephrased this as “the essence comes alive within the manifest being”.

²⁸ Steiner writes: “Anschauung” (literally “that what is viewed or beheld”)

²⁹ Steiner writes: “das Ideelle”—see the previous footnotes.

scores of books deal with calculus, for instance. They are all written in a different manner (hence they are not designated as forms of plagiarism). The teachers which use these books must understand the conceptual content presented in them in order to be able to teach it to their students. *They* explain this content in a way which they hope kindles understanding in *their* students. Yet, once again, this kindling of understanding is a purely subjective experience—understanding only occurs within the subject. Thus, we live in a world in which our thinking moves from objective presentation to subjective experience to objective presentation etc. Understanding happens on the most intimate, subjective level. The designation “subjective” refers to the experiential quality of understanding. It doesn’t mean that *what* is understood is subjective. What is understood can be as universal as the rules of calculus, the idea presented as Newton’s first law of physics, or the archetypal phenomenon of the plant as presented by Goethe. It transcends what can be designated objective or subjective.

The idea of cognition and applying Steiner’s method in psychological enquiry

Rudolf Steiner presented a way in which the method of scientific investigation remained true to the act of cognition itself—without contaminating cognition, or scientific investigation, with ideas that are not based on what can be observed. In order to be able to do this he first needed to investigate the act of cognition itself in a similar way. As a result of investigating the act of cognition in this manner he revealed the *idea of cognition*. The idea of cognition is the *essence* of human knowledge. It is the result of turning the act of cognition upon *itself*—pure and unbiased by preconceptions. It is interesting—and frankly concerning—that Steiner’s epistemological achievements are so little known today. Although his writing is often described as difficult to follow, when one allows oneself to engage with it, it carries the potential of “unmuddying” one’s thinking—put in a different way, it carries the potential to lead to the realization that one’s thinking is (rather seriously) muddled and at the same time it indicates a way out of this cognitive state of affairs.

Steiner’s presentation of his understanding of cognition, as well as his untangling it from the remnants of earlier attempts at explaining cognition, surpasses any other investigation of cognition that is known to me—both past and contemporary.

I believe that the method implied in his epistemological work offers great potential for psychological research. As Steiner indicated, inner phenomena can be observed and investigated in the same manner as phenomena appearing in the world around us.³⁰ By

³⁰ See for example footnote 6 in the introduction.

focusing attention on them these phenomena become objects of observation in the same way as phenomena in the world around us. Even if we perceive them as belonging to our own subjectivity, our mere attention turns them into objects of observation and renders them objective.

By investigating the way in which psychological phenomena are connected with one another as well as with other phenomena, and by penetrating to the phenomena that are only determined by *necessary* conditions, we can discover archetypal phenomena. By investigating the manner in which they are related to each other, these archetypal phenomena then offer a gateway to understanding the (psychological) phenomena under investigation.

If furthermore, the psychological phenomena we wish to investigate are related to the process of cognition, then Steiner's epistemological work also offers a basic roadmap that can guide our investigation. This concerns both the care he took in letting his thinking not be biased by existing theories, as well as the basic stages he identified in the act of cognition.

Concluding summary

Approached in an unbiased way, cognition reveals itself as an act that is purely a first-person experience. The primary goal of this study was to understand the *act of cognition*. In other words, to *understand* understanding, to *grasp* grasping, to *know* knowing, to turn the act of cognition upon itself. Stripping away the results of all previous cognition, allowed Rudolf Steiner to arrive at the point where the act of cognition revealed itself as the coming together of what is perceived in the immediately given (the percept) and the conceptual content brought forward by thinking in response to this perception (the concept). Steiner realized that understanding can be understood as the coming together of percept and concept (Steiner, 1980).

As a first-person experience, understanding is the inner communion with the meaning (the concept) which is brought forward by thinking in response to the observation of the immediately given. As it occurs, this act of cognition cannot be proven, shared or observed. It can only be experienced. Understanding cognition means to penetrate this act.

The act of cognition can be understood by experiencing it and allowing thinking to reveal its essence. In other words, by allowing the act of cognition to unfold upon *itself*. All other theorizing about cognition remains on the outside of this act and merely brings ideas about what cognition *might* be—it doesn't penetrate the act of cognition itself (it mostly doesn't even *consider* the act). Contemporary cognitive psychologists and neuroscientists consider cognition primarily from a mechanistic perspective. They study cognition as a series

of mechanisms that processes information and try to connect these information-processing mechanisms with neurophysiological mechanisms in the brain.

In *Wahrheit und Wissenschaft* Steiner wrote: “Epistemology must be a scientific investigation of what all other sciences presuppose without examining it: *cognition* itself.” (Steiner, 1980, p. 25). Psychology and neuroscience pretend to investigate cognition without trying to understand it. This leads to a situation in which psychologists and neuroscientists appear to be circling around cognition without knowing where to look. Cognition as an act is so close to them (as a first-person experience) that they appear to overlook it. Instead they look at ideas about information processing, investigate neurophysiological processes and neurological and artificial networks in the hope of finding cognition. They truly behave as investigators that attempt to understand time by studying clocks.

This study proposes the introduction of the Goethean phenomenological approach in psychological research. This approach follows the act of cognition itself in that it observes given phenomena while withholding theorizing. It allows thinking to bring forth the conceptual content in response to the observation of the phenomena. In the two following studies of this thesis this approach will be put to use in the investigation of psychological trauma and trauma processing.

Study 2

Toen wende Johannes langzaam het oog van Windekind's wenkende gestalte af en strekte de handen naar den ernstigen mensch. En met zijnen begeleider ging hij den killen nachtwind tegemoet, den zwaren weg naar de groote, duistere stad, waar de menschheid was en haar weedom.

Frederik van Eeden, 1892

Then Johannes slowly took his eyes from the beckoning figure of Windekind and stretched his hands towards the earnest human being. And with his companion he went in the direction from where the chilling night wind came, the heavy road towards the big, dark city, where humanity resided and its suffering.

Ik ben ik niet meer,
waar mijn kennis eindigde,
begon de vraag

Participant 2.2, 2023

I am I no longer,
where my knowledge ended,
the question begun.

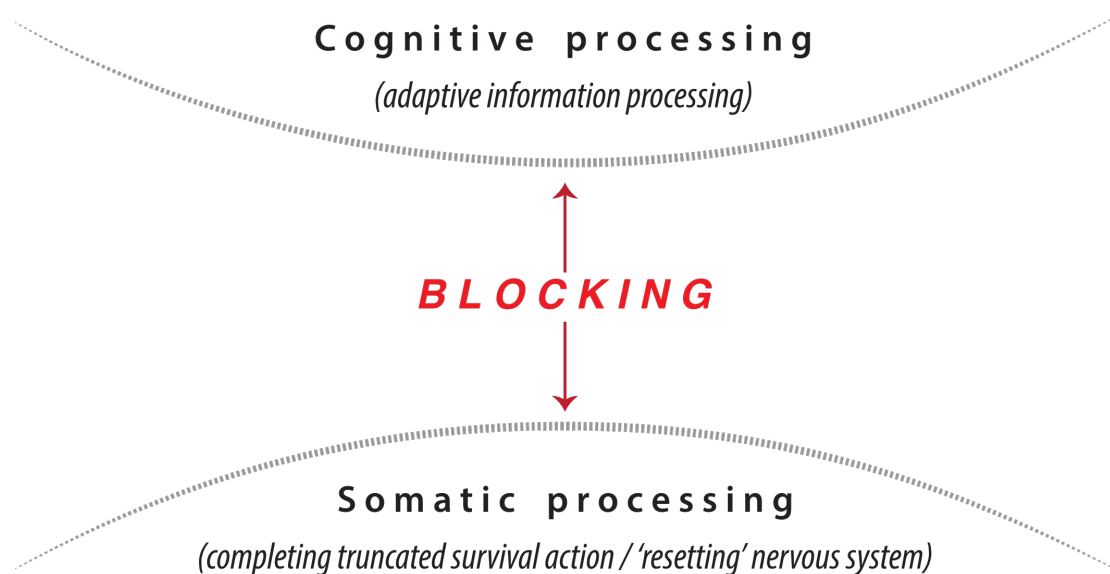
The Inner Experience of Trauma Processing

The processing of traumatic memories has cognitive and somatic dimensions

In an earlier stage of this research we proposed that psychological trauma results from a blocking or dysregulation of natural processes that form part of an innate capacity for self-regulation (de Wit, 2019; de Wit & Cruz, 2021). We proposed that this innate capacity not only drives the processing of traumatic memories, but may also drive two of the four main symptom-clusters of *posttraumatic stress disorder* (PTSD) listed in the *Diagnostical and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013). Cognitive intrusions (the symptom-cluster belonging to diagnostic criterion B) and arousal/reactivity (the symptom-cluster belonging to diagnostic criterion E) could thus be seen as attempts of the innate capacity for self-regulation to initiate processing of traumatic memories, while mindfully allowing these reactions to unfold in a safe and therapeutic environment tends to lead to resolution of the trauma (de Wit, 2019; de Wit & Cruz, 2021). These hypotheses are based on the clinical experience of treating trauma with different forms of therapy, notably *Eye Movement Desensitization and Reprocessing* (EMDR) (Shapiro, 2001, 2002), *Somatic Experiencing* (SE) (Levine, 2010, 2015, 1997) and *Extended Connected Breathing* (ECB) (de Wit, 2016; de Wit, 2019; de Wit & Cruz, 2021; de Wit et al., 2019).

Figure 4

The blocking of cognitive and somatic processing in trauma



Note. Psychological trauma as the blocking (or dysregulation) of cognitive and somatic processing. Adaptive information processing is a term used in EMDR to indicate healthy (cognitive) processing of traumatic memories, while Somatic Experiencing aims at completing survival actions and resetting the autonomous nervous system (see main text for explanation).

A closer look at the above-mentioned clinical experience reveals that the processing of traumatic memories appears to have a cognitive as well as a somatic dimension (de Wit, 2019; de Wit & Cruz, 2021) (see Figure 4). From this perspective, cognitive intrusions and their processing can be seen as related to the cognitive dimension of trauma, while arousal/reactivity can be seen as related to the somatic dimension. Furthermore, some forms of therapy predominantly focus on the somatic dimension of traumatic processing, while others focus more on the cognitive dimension.

Somatic Experiencing is an example of a therapy that focusses predominantly on the somatic dimension of trauma processing. Based on ethological observations of prey animals surviving a predator attack and on extensive clinical experience, Peter Levine, who developed SE, bases his trauma theory largely on the hypothesis that the autonomous nervous system (ANS) of the trauma patient remains frozen in its reaction to the traumatizing event. Levine contributes this dysregulation to what he refers to as *fear-potentiated immobility* (Levine, 2010). Immobility is an innate response to immanent threats to life, triggered when a flight or fight response is not (or no longer) effective to deal with a threat (see e.g. Levine, 2010; Schauer & Elbert, 2010). In cases where prey animals survive a predator attack, they go through a period of severe trembling and shaking that appears to allow them to recover from the immobility response (this applies particularly to higher animals such as birds and mammals). Levine postulates that this shaking ‘resets’ the animal’s ANS to its normal state (see also Berceci, 2008). This recovery can be suppressed however, leading to a greatly decreased ability to cope (e.g. see Ginsburg, 1975; Richter, 1957). Levine hypothesizes that, particularly in humans, the experience of *fear* can reinforce (or “potentiate”) the immobility response, thereby preventing recovery (Levine, 2010). SE aims at gradually dissolving this immobility response. Subsequently the patient is guided through completing truncated survival actions in order for the nervous system to release excess survival energy and return to its normal state.

EMDR is an example of a therapy that focusses more on the *cognitive* processing of traumatic memories. Francine Shapiro, who developed EMDR, assumes that this processing takes place on a neurophysiological level and describes it as follows:

A principle that is crucial to EMDR practice (...) is that there is a system inherent in all of us that is physiologically geared to process information to a state of mental health. This adaptive resolution means that negative emotions are relieved and that learning takes place, is appropriately integrated, and is available for future use. The system may become unbalanced because of a trauma or because of stress engendered

during a developmental period, but once it is appropriately activated and maintained in a dynamic state by means of EMDR, it can rapidly transmute information to a state of therapeutically appropriate resolution. (Shapiro, 2001, p. 15)

Shapiro refers to this process as *Adaptive Information Processing* (AIP). During an EMDR session the practitioner targets traumatic memories by following a scripted treatment protocol and by applying bilateral stimulation. The treatment protocol focusses on cognitive and affective aspects of the traumatic memory. The protocol in combination with the bilateral stimulation is thought to trigger a rapidly evolving dynamic state of mental and affective association, inducing “desensitization, spontaneous insights, cognitive restructuring, and association to positive affects and resources” (Shapiro, 2001, pp. 15-16). The actual processing of traumatic memories during an EMDR session only takes a few minutes (e.g. Servan-Schreiber, 2004; Shapiro, 2001, 2002; van der Kolk, 2002, 2014). Although trauma processing during EMDR sessions frequently involves somatic experiences, its theorists believe that AIP is predominantly a neurocognitive process in which traumatic memories are assimilated into more adaptive neural networks (Shapiro & Laliotis, 2011; Solomon & Shapiro, 2008; Stickgold, 2002). The somatic experiences that occur during EMDR sessions are believed to be an effect of these neurocognitive processes.

During an earlier stage of this research, in which we used ECB to treat a firefighter suffering from PTSD, we demonstrated that successful trauma processing can involve both somatic and cognitive processing and that both forms of processing play a distinct part in the treatment of trauma (de Wit, 2019; de Wit & Cruz, 2021).

A closer look at the cognitive processing of traumatic memories

In an article published in 2019 we argued that the AIP theory proposed by Shapiro and in particular its proposed mechanism (Solomon & Shapiro, 2008) are too materialistic. The mechanism that Solomon and Shapiro propose presupposes neurobiological memory networks in the (central) nervous system, of which there is no empirical evidence. We also observed that Shapiro’s explanation of the associations that occur during trauma processing is incongruent with inner experiences of trauma processing during ECB (de Wit et al., 2019).

The inner experience of rapid memory associations is a common phenomenon during both EMDR and ECB sessions in which traumatic memories are being processed. Shapiro explains these associations as the subjective experience of (supposedly objective) traumatic memories building new connections with larger “neural networks”. She posits that traumatic memories remain largely isolated from larger, more adaptive neural networks. They retain a “state-specific form” (Solomon & Shapiro, 2008, p. 316)—this means that as long as they

remain isolated, they retain the form of the original experience. During the associations that occur when traumatic memories are being processed these isolated networks start to build connections with larger, more adaptive neural networks. When the trauma memory has been fully processed it has been assimilated in such a larger network and no longer exists as an isolated network. Thus, according to this theory, the processing of traumatic memories consists of 1) isolated memories establishing new, previously not existing connections with larger neural memory-networks, and 2) the traumatic memories being fully assimilated in such a larger, more adaptive neural memory-network (Shapiro, 2001, 2002; Shapiro & Laliotis, 2011; Solomon & Shapiro, 2008; Stickgold, 2002). According to Shapiro and her co-authors, assimilation of smaller neural memory-networks into larger, more adaptive neural networks is what constitutes *learning*.

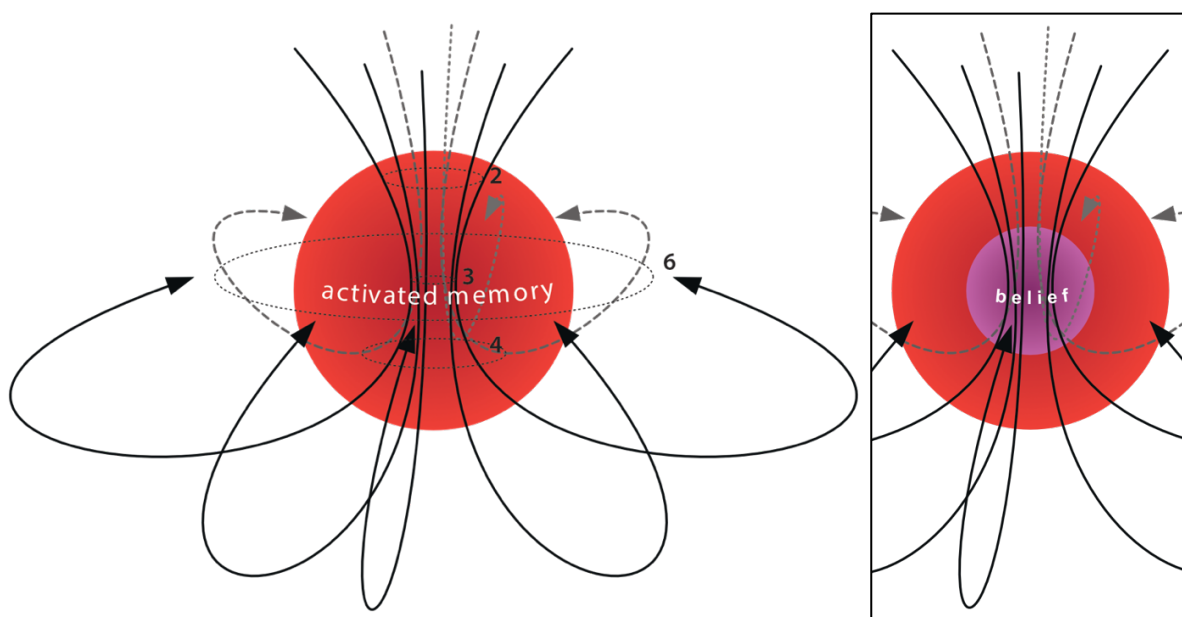
Based on inner and clinical experience during ECB sessions we argued that the association phase of trauma processing is in fact part of a process of cognitive *re-evaluation*—not of *assimilation*. During this process the *meaning* that has been associated with the traumatic experience and with how this experience relates to the self is *objectified* and *re-evaluated* (de Wit et al., 2019).

Reflecting on the deeper essence or nature of these two explanations—one based on the existence of neurobiological memory networks, the other based on meaning—it becomes clear that the explanations depart from radically different theoretical and epistemological starting points. Shapiro and her co-authors depart from a view that is commonly held in contemporary neurocognitive science. This view holds that, ultimately, cognitive processes fall together with and can be equated to objective (chemical/biological) processes in the nervous system. This view is implicit in their reasoning—they refer to neural networks, not to actual neurobiological processes. However, although not referred to explicitly, their descriptions of dynamic connections between neural networks presupposes a material neurological substrate that forms the basis of such networks and their connections. They also imply that memories are somehow stored in or associated with such networks. In short, their explanations rests on neurological processes—processes that are presumed to take place in the nervous system of the trauma patient. The inner experiences of the trauma patient are presumed to be a subjective *result* of these (objective) processes taking place in the nervous system. Again, this last conclusion is implicit, it is nowhere stated explicitly. For clarity I want to reiterate here that the “objective” processes taking place in the nervous system of the trauma patient as proposed by Shapiro and her co-authors are entirely *hypothetical*, there is no direct empirical evidence of such processes. The only direct evidence of the process under

research here are the first-person accounts of the trauma patients undergoing EMDR treatment. Our explanation takes these first-person experiences as its starting point. It is an attempt to understand trauma processing from the *inside-out*—that is, it tries to build an understanding of what occurs during trauma processing based on the content of first-person accounts of the processing that takes place during ECB and EMDR treatment. However, we would like to re-emphasize here that, apart from endeavoring to understand trauma processing from the inside-out, our explanation takes the only direct information as its starting point, and not a hypothesized state-of-affairs—no matter how much that “hypothesized state-of-affairs” may be acceptable to contemporary cognitive scientists.

Figure 5

Immersion and objectivation during the processing of a traumatic memory



Note. Graphical representation of the processing of an activated traumatic memory. The numbered concentric circles in the left image correspond to the phases described in “An Exploration of the Processing of Suppressed Memories During Rebirthing Breathwork,” by P. A. J. M de Wit, C. A. D. de Oliveira, R. V. d. L. Costa, R. M. Cruz, and C. B. Menezes, 2019, *Revista Brasileira de Psicoterapia*, 22(1), p. 75 (<https://doi.org/10.5935/2318-0404.20190005>). (A table from the article that lists all 9 phases is reproduced in Appendix 1). Phase 2 constitutes the successful negotiation of the defense phase and the beginning of subjective immersion in the activated memory (full immersion occurs at phase 3). At phase 4 consciousness of the memory is inverted (turned inside-out) and one becomes able to look at salient aspects of the memory in an objective manner—underlying thoughts/beliefs associated with the memory become objectified (insert on the right)—leading to insight (phase 6). Copyright 2020/2022 by P. A. J. M. de Wit

To recapitulate our exploration of trauma processing in de Wit et al. (2019), we identified three phases in the re-evaluation process. Immersion or surrendering to the presenting trauma memory or to somatic symptoms associated with the memory constitutes the first phase, which we referred to as *immersion*. To be clear, to be able to reach this phase

the patient will have to let go of at least part of their defenses in order to allow the traumatic memory or the somatic symptoms associated with it to present themselves. During this immersion phase the patient surrenders to the subjective experience of the trauma memory and identification with the traumatic experience is maximal. The next phase is the *association* phase. Consciousness enters a more dreamlike state during this phase and strong REM tends to be the rule. In this phase the patient experiences a rapid succession of memories that in hindsight appear meaningfully connected with the traumatic memory experienced during the immersion phase (hence our conclusion that the associations experienced during this phase are associations that *already existed* and come to light now; they are not new associations, as suggested by Shapiro and her co-authors). We referred to the final phase of this process of re-evaluation as *insight* or *epiphany*. During this phase a limiting thought or belief that the patient had identified with as a result of the traumatic experience suddenly appears in objectified form. This belief was also the common denominator of the memories that occurred during the association phase, but at that stage it was not yet identified. It is now objectified and recognized as a thought that is no longer accurate—it thereby ceases to be *believed*. Figure 5 gives a graphical representation of this process of re-evaluation (the figure doesn't represent the association phase).

With this study we continue the investigation of the processing of traumatic memories. In Study 1 we presented the epistemological work of Rudolf Steiner and his core observation that cognition (knowing/understanding) is the synthesis of percepts with concepts (Steiner, 1980, 1995a). In this study we investigate the processing of traumatic memories from the perspective of Steiner's understanding of cognition. In other words, we link trauma processing to Steiner's observation that cognition is the synthesis of percept with concepts.

Cognition as synthesis of percept and concept

Steiner describes the percept as the result of focusing one's attention on a given phenomenon. This given phenomenon may be perceived outside or within the mind of the observer (it may therefore be an object or process in the world, but it may also be a thought, a feeling, an impulse etc.). In Steiner's own words the percept is the "immediate experiential content apprehended by the conscious subject through observation" (Steiner, 1995a, p. 62, translated from the German original by the author). Thus, the percept is what presents itself—what is *given*—as the immediate result of outer or inner observation. By allowing *thinking* to engage with the percept, it (thinking) brings forth the conceptual content that *completes* the percept and makes it understandable. The concept must be actively brought forth by thinking, yet its essence is intuited (its essence is fully and directly transparent or known to thinking;

thinking becomes momentarily one with it—Steiner refers to this as *intuition*). Concepts (ideas) are not constructed by thinking, they exist *a priori* (Steiner, 1980). All this has been described extensively in Study 1.

It should be noted that when he uses the term “thinking”, Steiner refers to an (inner) activity that includes more or less all cognitive activities known to us, not merely being engaged in thought or reasoning. Steiner’s use of the term thinking covers almost any inner activity we undertake. He likens the relation of thinking with observation to the relation of waking experience with dreaming (Steiner, 1995a, p. 85). Furthermore, in essence cognition in the sense it is meant here—i.e. cognition in the sense of “knowing” or “understanding”—is strictly a *first-person* activity; it requires a first person, an “I”. To refer to cognition as taking place in a nervous system makes no sense. *I* can know, or understand something, a nervous system cannot. At present the nervous system is thought to relay “information”. Even if that view proves warranted, a nervous system can never *understand* information—or even *what* information *is*.

Cognition then, occurs when thinking unites percept with concept. It is in human consciousness that the world appears separated in percept and concept, in itself the world is complete. Although the conceptual content doesn’t show itself explicitly in the world and is only revealed through thinking, a stone thrown into the air will follow a parabolic trajectory, whether the mathematics to predict this trajectory have been developed or not (Steiner, 1995a). Likewise, certain phenomena lead to others, even though causes and effects can only be determined and predicted once the underlying concept of causality has been intuited (Steiner, 1980).

Cognition and trauma

But what happens when human consciousness is exposed to a potentially traumatic experience? How does human consciousness give meaning to such an experience? During life-threatening experiences—whether they occur to oneself or are witnessed as occurring to someone else—the victim experiences they are unable to protect themselves from perceived harm. This is the percept. The concept that is intuited in such cases tends to revolve around *inability* and is self-reflective. It appears to lead to conclusions such as “I can’t do it”, “I’m not good enough”, “I am worthless” etc.—limiting self-beliefs that are commonly expressed by trauma patients.

Our hypothesis is that during trauma processing this conclusion, which reflects a severely limiting self-perception, is *challenged*. We also hypothesize that the process by which this challenging takes place is *itself* a process of cognition, in which the original

conclusion is re-assessed from a perspective that goes beyond a deterministic-materialistic world- or “self”-view. In order to find out more about this process we are investigating how this process is experienced by the person undergoing it. As stated above, the process of cognition is strictly a first-person experience; therefore investigation of the cognitive processes occurring during trauma processing inevitably uses first-person accounts.

Research aims

Main research aim

To explore the inner experience of trauma processing

Secondary research aims

1. To investigate whether the inner experience of trauma processing is consistent with the process of cognition as the synthesis of percept and concept.
2. To explore the inner experience of the conceptual content in more detail.

Hypotheses

1. Limiting self-beliefs of traumatized individuals are based on percepts that are united with the concept of inability.
2. A successful re-assessment of limited self-beliefs requires conceptual content that goes beyond contemporary deterministic-materialistic worldviews.

Method

Nature of this study

This is a mixed method³¹, phenomenological study that focusses on first-person accounts of the inner experience of trauma processing.

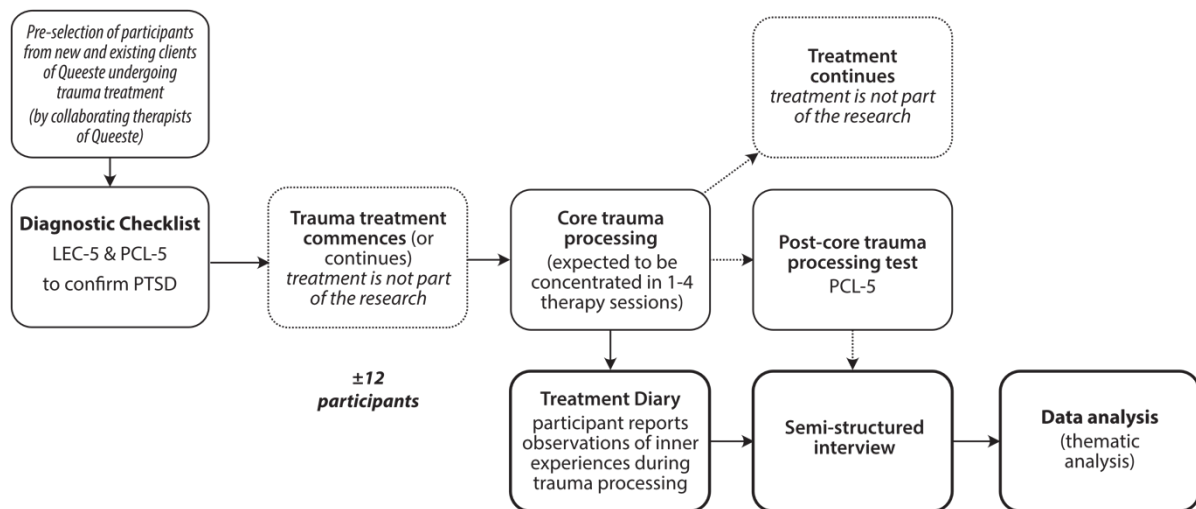
Method

Design

Figure 6 shows a flow diagram of the general design of this study.

Figure 6

Flow diagram of the general design of this study



Note. The participants in this study are approximately 12 clients of Queeste undergoing trauma treatment. The treatment itself is not part of the study (dotted frames). In the period during which the main trauma processing takes place, the participants report about their inner experiences of trauma processing. These reports and the semi-structured interview that follows form the data for this study (the three heavy-lined frames in the bottom are related to the data).

The design used in this study is based on the approach commonly known as *Goethean science*. As elaborated in Study 1, Steiner distilled his “idea of cognition” (Steiner, 1980) from what is known as Goethe’s phenomenological approach. This approach was first outlined in the scientific work of Johan Wolfgang von Goethe (1749-1832), was revived by Steiner and has been expanded by scientists who adopted it after him. Nowadays this approach is mostly known in the English-speaking world as Goethean science, Goethean observation, or Goethean phenomenology (Bortoft, 1996, 2012; Brook, 2009; Edelglass et al., 1997; Goethe, 1988; Hoffmann, 1998; Lehrs, 1951; Maier et al., 2006; Seamon & Zajonc,

³¹ The nature of the main part of this study is qualitative. However, quantitative analysis is used to ascertain more objectively that participants have processed trauma during the part of the treatment about which they report. Therefore, the jury of professors that judged this thesis felt it appropriate to designate it a mixed method study.

1998; Steiner, 1980, 2003a; van Gelder, 2004). Goethean Science is predominantly used by natural scientists to investigate outer phenomena. However, based on the indications of Steiner there is no reason that it can't be applied to investigate inner phenomena (Steiner, 1995a). The approach is based on detailed observation of the phenomenon under investigation, while refraining from early theorization. From this point of view it has similarities with later forms of phenomenology based on Husserl's approach that emphasize holding one's judgements at bay while investigating a phenomenon (known as phenomenological reduction, bracketing or Epoché, e.g. see Cogan, 2021, 19 Sept.; Langdridge, 2007). Cognition (i.e. understanding of the phenomenon under investigation) is understood to emerge dynamically as thinking engages with the observations and discovers the conceptual content that "completes" the observations (Steiner, 1980, 1995a). Although it is a qualitative approach, the Goethean approach goes beyond the common distinction between objective and subjective often used to differentiate between quantitative and qualitative approaches. As explained in Study 1, it seeks to objectify phenomena—also inner phenomena that are investigated using a first-person perspective. Without explicitly referring to Goethean science there is a growing number of psychological studies by German scientists that uses this approach (e.g. Wagemann & Raggatz, 2021; Wagemann & Weger, 2021; Weger & Herbig, 2020; Weger & Wagemann, 2015; Weger et al., 2018a; Ziegler & Weger, 2018a, 2018b). From the traditional approaches used in qualitative psychological research, the Goethean science approach comes closest to the iterative inductive-deductive approach used in designs based on *Grounded Theory* (Corbin & Strauss, 2015; Glaser & Strauss, 2006).

Most basically then, this study investigates experienced phenomena associated with trauma processing using an approach based on Goethean science. It does this by collecting and analyzing first-person observations made by approximately 12 clients at a specialist mental healthcare provider during their trauma treatment.

Participants and context

Queeste, a specialist mental healthcare³² provider in Alkmaar (the Netherlands) is collaborating in this study. Queeste is part of a larger healthcare provider, the *Raphaëlstichting* (<https://www.raphaelstichting.nl/queeste/>). Four therapists of Queeste, specialized in various forms of trauma-treatment, pre-select and invite clients starting trauma-treatment to take part in the study. The therapists use one or more of the following

³² In Dutch: specialistische geestelijke gezondheidszorg (SGGZ).

treatments: *(trauma-focused) cognitive behavioral therapy (CBT), psychoanalysis, imaginal exposure, EMDR, and dream travel therapy* (see Kharitidi, 1997, 2001). The ultimate aim is to select approximately 12 clients undergoing trauma-treatment to take part in the study. Up to this point of 4 clients have participated, therefore we have decided to continue the research-project until approximately 12 clients have completed their participation. For the purpose Study 2 of this thesis we will use the data from the clients that have completed their participation up to the middle of January 2023 as an intermediate report of this project. The therapy itself is not part of the research, only the participants' observations of trauma-processing are being investigated. In order to record these observations, the clients are asked to keep a treatment diary, but only for the sessions in which trauma-processing is taking place. They are requested to record their observations of their experiences when trauma is processed as accurately as possible. They can record their observations in written form and/or in pictorial form (artistic/imaging). Apart from during the therapy sessions the trauma-processing can also take place (or continue) between sessions. The participants are also asked to record their observations of such occurrences. The main trauma-processing is expected to be concentrated during (and between) one to four therapy sessions. Therefore, the main observation input by the participants takes approximately one to four weeks (with an average treatment intensity of one session per week). The time-involvement is between half an hour and one hour per session. After the main trauma processing a semi-structured interview is conducted with every participant to clarify their observations. This interview lasts between one and one-and-a-half hour (Gaskell, 2007). Thus the participation is concentrated over a period of two to five weeks, and during these weeks the time-involvement is between half an hour and one-and-a half hour per week.

As mentioned above, as of the middle of January 2023, 4 clients have completed their participation in the project. One of these 4 clients has suffered a severe loss since completing her participation, and for this reason she has not been able to share her recorded observations with the researcher and there has been no interview with her yet. Therefore, this intermediate report is about 3 of the four clients that have completed their participation in the project.

All three participants are women, aged between 32-42 years. Two have at least a master's degree, and one hasn't finished higher education. Two participants are working, one is unemployed. Two of the participants are of Dutch nationality and one is Romanian.

Inclusion criteria

To be included in this study the participant must be adult and diagnosed as suffering from psychological trauma. For this study this means that they fulfill the diagnostic criteria

for PTSD of DSM-5 (American Psychiatric Association, 2013). This is tested by asking the client to complete the *Life Events Checklist for DSM-5* (LEC-5) and the *PTSD Checklist for DSM-5* (PCL-5) with Criterion A (Boeschoten et al., 2014; Weathers et al., 2013b). In accordance with DSM-5 a positive item in LEC-5 (LEC-5 doesn't have a numerical score) and ≥ 1 item (score ≥ 2) for cluster B, ≥ 1 item (score ≥ 2) for cluster C, ≥ 2 items (score ≥ 4) for cluster D, and ≥ 2 items (score ≥ 4) for cluster E items in PCL-5 yields a provisional PTSD diagnosis. For this study, these are the minimal scores that will be used as an indication of PTSD. In addition, based on their professional experience the individual therapists assess the ability of the potential participant to perform introspection (in order to be able to provide relevant information about the first-person experience of trauma-processing).

Exclusion criteria

There are no specific exclusion criteria.

Variables

To assess whether pre-selected clients fulfill the diagnostic criteria, LEC-5 and PCL-5 with extended Criterion A are completed. The sole aim of LEC-5 is to verify whether the client has been exposed to a potentially traumatizing event. LEC-5 doesn't result in a numerical score. Extended Criterion A offers qualitative data about the most traumatic event the client has been exposed to. PCL-5 results in a total score and a score per diagnostic criterion. Pre- and posttreatment scores give an indication of symptom reduction, and—indirectly—of whether or not significant trauma processing has taken place.

The main data for this study are the entries in the treatment diaries of the participants and the recordings of the posttreatment interviews with the participants. The participants are asked to make notes and/or artistic representations following treatment sessions in which significant trauma processing took place. They are asked to describe as accurately as possible their experience of the trauma processing. If they find it helpful they may also give an pictorial (artistic) representation of their experience during the session. After significant trauma processing has taken place (this is judged jointly by the participant and their therapist) a semi-structured interview is conducted by the researcher with the participant (if they wish, together with their therapist). The goal of this interview is to clarify and elaborate on the written and/or artistic accounts of the experiences during trauma processing. The recording of this interview is transcribed and analyzed. Together the written and/or artistic accounts by the participants and the transcriptions of the interviews form the *corpus* of this research (Bauer & Aarts, 2007).

Materials/Instruments

LEC-5

The LEC-5 (Weathers et al., 2013b) is a self-report questionnaire to assess lifetime exposure to potentially traumatizing events. It consists of 17 items and takes approximately 5 minutes to complete. LEC-5 is an updated version of the *Life Events Checklist* (LEC) reflecting the changes made to the diagnostic criteria for PTSD in DSM-5. The previous version (LEC) was based on the diagnostic criteria for PTSD in DSM-IV. The LEC was developed at the *National Center for PTSD* in the US, concurrently with the *Clinician Administered PTSD Scale* (CAPS)—a structured interview for the diagnosis of PTSD (Weathers et al., 2015; Weathers et al., 2001). The LEC's original purpose was to assess lifetime exposure to potentially traumatizing events prior to the CAPS (Gray et al., 2004). LEC-5 is routinely used concurrently with various PTSD measures—not only CAPS-5, but also checklists such as PCL-5—to assess lifetime exposure to potentially traumatizing events, in accordance with diagnostic criterion A for PTSD of DSM-5. It is also used as a stand-alone measure to assess lifetime exposure to potentially traumatizing events.

There is no formal scoring protocol for the LEC-5; it does not yield a total or composite score. The main objective of its application is to verify whether a person has experienced one or more of the listed events and at what level of involvement/exposure (National Center for PTSD, 2017a). The Dutch adaptation of LEC-5 made by Stichting Centrum '45 and the Arq Psychotrauma Expert Groep will be used (Boeschoten et al., 2014). The Dutch adaptation of LEC-5 and PCL-5 with extended Criterion A is included in Appendix 2.

PCL-5 (with Criterion A)

The PCL-5 (Weathers et al., 2013a) is a self-report questionnaire that assesses the 20 symptoms of PTSD listed in the diagnostic criteria B-E in DSM-5. It takes approximately 5-10 minutes to complete. It contains 20 items (5 for the symptom cluster listed in criterion B (intrusions), 2 for the symptoms listed in criterion C (avoidance), 7 for the cluster listed in to criterion D (negative alterations in cognitions and mood), and 6 for the cluster listed in criterion E (arousal/reactivity). PCL-5 is the updated version of PCL-M/C/S³³ to reflect

³³ PCL-M was designed specifically for use with the military, PCL-C was adapted for use with civilians, PCL-S was designed for use in specific situations. The differences between the three versions are minor differences in the wording of the index trauma in 8 items (see Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and Initial Psychometric Evaluation. *Journal of Traumatic Stress*, 28, 489-498. <https://doi.org/10.1002/jts.22059> , p. 489).

changes to the diagnostic criteria for PTSD in DSM-5. Blevins et al. (2015) report “excellent reliability and validity” in two preliminary studies of the PCL-5, as well as “strong test-retest reliability” (Blevins et al., 2015, p. 496). Together with the revised *Impact of Events Scale* (IES-R) (Weiss, 2004), PCL-5 is the self-report measure most often used in research to screen for PTSD symptoms (compare e.g. Armour, 2015; Armour et al., 2012; Armour et al., 2016; Armour et al., 2015; Foa et al., 2009; Liu et al., 2014; Tsai et al., 2015; Yang et al., 2017).

There are several ways to use PCL-5 scores to yield a provisional PTSD diagnosis (National Center for PTSD, 2017b):

1. The individual item scores can be summed to obtain a *total symptom severity score* (ranging from 0-80). Different cut-off points can be used to yield a provisional PTSD diagnosis. The National Center for PTSD suggests a cut-off point of 33, based on preliminary validation work, but other scores have been used also.
2. *DSM-5 symptom cluster severity scores* can be obtained by summing up the scores of items 1-5 (providing the cluster B score), items 6 & 7 (providing the cluster C score), items 8-14 (providing the cluster D score), and items 15-20 (providing the cluster E score). Each item rated 2 (“Moderately”) or higher can be considered to endorse a symptom. Thus, in accordance with DSM-5: ≥ 1 item (score ≥ 2) for cluster B, ≥ 1 item (score ≥ 2) for cluster C, ≥ 2 items (score ≥ 4) for cluster D, and ≥ 2 items (score ≥ 4) for cluster E items yields a provisional PTSD diagnosis.

There are three versions of PCL-5:

1. a stand-alone version;
2. a version which also assesses Criterion A by asking participants to recall their worst stressful event involving actual or threatened death, serious injury, or sexual violence (either experienced directly witnessed, or by learning it happened to a close family member or a close friend) – this version is called *PCL-5 with Criterion A* and will be used in the survey;
3. a version which combines LEC-5 and PCL with Criterion A.

The Dutch adaptation of PCL-5 with extended Criterion A made by Stichting Centrum '45 and the Arq Psychotrauma Expert Groep will be used (Boeschoten et al., 2014) will be used for selection of participant (see Appendix 2). The same PCL-5, but without LEC-5 and extended Criterion A, will be used after the participants have undergone treatment. Completing PCL-5 with extended Criterion A takes about 15-20 minutes. Completing the stand-alone version takes approximately 10 minutes.

Corpus

The participants receive a book (a treatment diary) to record their observations of their first-person experiences of trauma-processing during the treatment sessions. They are free to record their observations in written form or in the form of (artistic) images. The participants can keep these written/artistic records, however, the researcher makes digital scans of them.

Based on the observations in the treatment diary a *topic guide* is constructed to prepare a semi-structured interview with each participant (Gaskell, 2007). Semi-structured interviews are conducted to clarify and deepen the understanding of the observations recorded in the treatment reports. The interviews are recorded and the recordings will be transcribed by the researcher. Together, the content of the treatment diaries and the semi-structured interviews form the corpus of this research (Bauer & Aarts, 2007)

Procedures

1. During 2021 several meetings have taken place between the researcher and the manager and four of the therapists of Queeste in which the research proposal has been discussed and adapted. Several suggestions of the therapists have been included in the final design.
2. The requirement for a proof that this research does not require separate ethical approval by a Dutch Medical Ethical Assessment Committee (Medisch Ethische Toetsingscommissie—METC) led to some more adaptations to the original research.
3. Referral of clients to the Queeste takes place through a primary health care provider (usually the client's family doctor). (*Referral and treatment are not part of this research*).
4. The four therapists of Queeste that take part in this research ask clients that are referred with an indication of possible trauma whether they are willing to take part in this study. They explain the goal of the study and what is required of the client. The therapists use their clinical judgement to decide which clients to ask for possible participation in the research.
5. Clients willing to take part in the study, and whose diagnosis has not yet been formally assessed, are asked to complete LEC-5 and PCL-5 with extended Criterion A to determine whether they fulfill the diagnostic criteria for PTSD of DSM-5. Furthermore, using their clinical judgement the therapist assess whether the client has the ability to conduct introspection to a sufficient degree.
6. Clients that fulfill the inclusion criteria (see previous step), are formally asked to take part in the study. They are asked to sign the consent form. It is clearly explained to the participant that they are free to withdraw their participation in the study at any point

during or after their treatment. The specific requirements and procedures of the study (recording of observations of first-person experiences during trauma processing and participation in the semi-structured interview) are explained in detail. See Appendix 3 for the instructions for the observation of inner experiences during trauma processing—in Dutch. Basic sociodemographic data are also recorded. Ideally approximately 12 participants will take part in this study.

7. The client commences or continues therapy with the therapist. (*The treatment itself is not part of the research*).
8. After sessions in which significant trauma processing has taken place the participant records their observations of their inner experiences. This can also include experiences that occur between sessions and significant dreams. Recording can take place in the form of writing or in the form of (artistic) imagery.
9. When the participant and/or their therapist agree that trauma symptoms have been significantly reduced the participant completes another PCL-5. The NCPTSD suggests a reduction in the score by 10 points as a minimal threshold for clinical improvement (National Center for PTSD, 2017b). If this minimal threshold is reached a semi-structured interview with the researcher is planned. Planning of the interview does not mean that the therapy is finished—the therapy continues as planned. However, after the interview has been planned the participant no longer needs to record their observations of their experiences (at least not as part of their participation in the research).
10. The records of the observations made by the participant about the trauma processing are shared with the researcher before the interview. Based on the content of the participant's observations the researcher creates a *topic guide* (Gaskell, 2007) in preparation for the semi-structured interview. The researcher digitalizes (scan) the records and the original records will be returned to the participant.
11. A semi-structured interview is conducted with the participant by the researcher. If requested by the participant, the therapist will also be present during the interview. The expected length of the interview is one to one and a half hour (Gaskell, 2007). The interview is recorded. At the end of the interview the participant is debriefed.
12. The recording of the interview is transcribed.
13. The written/pictorial records by the participant and the transcriptions of the interviews are analyzed by the researcher.
14. The findings of the study will be shared with the therapists and the participants.

Data organization and analysis

To abide by Dutch privacy regulation, the participants are coded from $X.1-X.n$ (where X is the number of the therapist and n the number of the participant treated by this therapist). After the transfer of the data (digital scans of the written/artistic records by the participants and transfer of the digital recordings of the interviews—these digital data are stored on a USB storage device), the original written/artistic records is returned to the participants and the original recordings (on a smart phone or laptop) are permanently deleted from the recording device. The data will be stored securely on a USB storage device and back-up to a second USB storage device. The data on both devices are encrypted (at least 128bit encryption) and password protected, and will only be accessible to the researcher. The paper checklists (LEC-5 and PCL-5 (with extended Criterion A) and the sociodemographic data about the participants are also digitalized and stored in the same manner. The original checklists and forms containing sociodemographic data are kept on one of the premises of the Raphaëlstichting, where they are only accessible to the research team.

Data analysis

Verifying trauma processing. Scores and categorical results from pre- and posttreatment PTSD-related measures (PCL-5) are compared to verify trauma processing. The procedure for measuring clinical change with the PCL-5 is still being determined, but the *National Center for PTSD* in the USA states that measures for reliable and clinical change are expected to be in a similar range as they are for the previous versions of the PCL (National Center for PTSD, n.d.). Evidence for the PCL (Clapp et al., 2016; Jacobson & Truax, 1991; Monson et al., 2008) suggests a reduction in the score of “5 points as a minimum threshold for determining whether an individual has responded to treatment and 10 points as a minimum threshold for determining whether the improvement is clinically meaningful” (National Center for PTSD, n.d., p. 3). Therefore the pre- and posttreatment PCL-5 scores are calculated and compared. An overall difference between the two scores higher than 10 points will be taken as evidence that significant trauma processing has taken place. Furthermore the scores of the different diagnostic criteria (B-E) will be compared as well as the number of items per criterion scoring ≥ 2 .

Qualitative data analysis. First the qualitative data is pre-analyzed, using an inductive approach. Initially the descriptions of first-person experience is taken as much as possible at face value. We (the researchers) recognize that some experiences encountered during and in between sessions may be new and unlike participants’ ordinary experiences. Participants are likely to refer to existing concepts to construct new meanings to make sense

of these experiences. However, the written/verbal accounts are not interpreted in the manner in which verbal accounts tend to be interpreted in researches that use constructivist approaches. The goals of the semi-structured interview are to clarify the records made by the participant and possibly to develop a deeper mutual understanding of what happened during trauma processing. Using the Goethean approach discussed in Study 1 we endeavor to identify common phenomena from the participants' reports. Subsequently, in a more detailed analysis of the data an approach based on *Thematic Analysis* is used (see e.g. Braun & Clarke, 2006; Castleberry & Nolan, 2018; Maguire & Delahunt, 2017; Nowell et al., 2017). This analysis moves between induction and deduction to identify common themes in a) the participants' experiences and b) the participants' descriptions of the processing taking place during and between sessions. Thus, the full corpus of data is used to distill information regarding the processes involved in the processing of trauma.

Table 1 gives a summary of the method of this study.

Table 1

Summary method Study 2

Study 2	
Goal	To explore the inner experience of trauma processing
Design	Qualitative study, investigating phenomena associated with trauma processing using an approach based on Goethean science. Main data: first-person observations made by clients during trauma treatment.
Participants	Approximately 12 clients of Queeste (SGGZ provider) undergoing treatment for psychological trauma
Inclusion criteria	PTSD diagnosis according to DSM-5 criteria (determined with LEC-5 and PCL-5 with extended criterion A)
Instruments	LEC-5 and PCL-5 with Criterion A – (description of main traumatic event and PTSD symptoms); stand-alone PCL-5. Treatment diary. Topic guide. Semi-structured interview. Recorder.
Analysis	Qualitative: inductive-deductive (thematic).

Ethical procedure

This research project abides by Resolução 466/2012 of the Conselho Nacional de Saúde regarding research with human beings (Conselho Nacional de Saúde, 2013). It has been submitted to Plataforma Brasil during the master part of this project. After two

amendments the project was approved by the ethics committee of UFSC on March 26, 2018 (CAAE: 803767.000.0121; N° do Parecer: 2.562.777). In April another amendment was made. The amendment was approved on April 25, 2018 (N° do Parecer: 2.621.518). The current study required another amendment to the project, which was submitted after the Dutch METC declared that—according to Dutch regulations—medical ethical approval was not required for this study. The amendment was approved on May 26, 2022 (N° do Parecer: 5.433.333).

We declare that participation in this study does not cause undue risk to the physical and psychological integrity of the participants and that no financial reward will be offered. Participation is voluntary (in Brazil it is not allowed to reward the participants for participation in research). Participants may withdraw from the research at any moment as well as request destruction of the data collected/submitted for the research. This is clearly mentioned in the information letter that accompanies the consent form. The information letter and the consent form are formatted according to the Dutch standard requirements. The information letter contains information about the purpose and the background of the research, about all procedures to which the participant is submitted, about potential discomfort, potential benefits, as well as about confidentiality of the data, the possibility to request orientation and assistance from the research-team, and it provides contact information of the responsible researcher, of an independent expert, of the person responsible for data-protection within the organization and where the participant can go in case they have complaints. The letter also informs the participant that participation is voluntary and that they will not receive a monetary reward for their participation. Only those who agree with participation by signing the consent form are allowed to participate in the research. Participants are properly debriefed at the end of the semi-structured interview. As they have already been referred for psychological therapy for trauma-related issues, their participation in the research is not expected to lead to additional health issues or medical services. (The official information letter and the Dutch consent form are included in Appendix 4—both in Dutch).

Results

Trauma, treatment and interviews

According to LEC-5 and Criterion A data, all three participants have suffered from physical and sexual abuse during childhood and/or adulthood. One participant only remembered this during the sessions (participant 4.1), this participant initially only remembered witnessing child sexual abuse of a sibling as a child. As an adult one participant

(1.1) has been a victim of severe life-threatening violence, and was severely injured as a result of this .

Participant 4.1 received CBT combined with brief psychoanalysis as well as a complementary therapy that uses speech. The part of her treatment for which she participated in this study started in June and finished in September. She made brief notes in a diary about her inner experiences after some of her sessions. These notes were made available to the researcher for use in this study. The semi-structured interview with her took place on October 18, 2022 and her therapist was also present during the interview. The other two participants received two whole days of treatment. On each of these days they received two EMDR sessions. The first treatment day started with an imaginal exposure session (see e.g. Peterson et al., 2019). During imaginal exposure the client retells one or more traumatic experiences as if they are happening in the present time (using the present tense), without avoiding any details. There was a two-week interval between the two treatment days (with “homework”). Participant 1.1 started her treatment at the end of August and had her second sessions in September. She made detailed notes of her experiences on both days, which were made available to the researcher. The semi-structured interview with her took place on January 5, 2023. Although I interviewed participant 1.1 almost 4 months after she finished the treatment, she appeared to be able to recall her experiences during the treatment very accurately despite the lengthy interval.

Participant 2.2 had her treatment sessions in November. She took notes between the sessions and also between the two therapy days. Some of her notes are rather poetic, while others are narrative. She also made one drawing using oil crayons. The interview with her took place on January 13, 2023.

The occurrence of trauma processing

Table 2 lists the pre- and posttreatment PCL-5 scores. Here “pre-” and “posttreatment” refer to the part of the treatment that was part of the research, not the overall treatment. According to the therapists and the clients significant trauma processing had taken place in this part of the treatment. As this study is concerned with the inner experience of trauma processing these results are interpreted as an indication that trauma processing has indeed taken place. This is determined by verifying whether the reduction in trauma symptoms can be considered clinically significant. As recommended by the National Center for PTSD (n.d.), a reduction in the overall score of at least 10 points was considered clinically significant. As can be seen in the table all participant showed a clinically significant reduction in their overall PCL-5 score. Although the posttreatment diagnosis of participant

2.2 is technically negative, this is only because she scored only one of the two required items in cluster E as ≥ 2 . For PCL-5 the recommended cut-off score for a positive PTSD diagnosis is between 31-33 (National Center for PTSD, n.d.), therefore her score alone would still warrant a positive diagnosis. Note: at the time of the interview particularly participant 1.1 gave a strong impression of having healed further since her treatment (there was a gap of almost 4 months between her treatment and the interview and in the mean time she had received additional treatment and taken part in a training to help her deal with her emotions).

Table 2

PCL-5 scores pre- and posttreatment

	Participant 1.1				Participant 2.2				Participant 4.1			
	pre		post		pre		post		pre		post ^a	
	score	items ≥ 2	score	items ≥ 2	score	items ≥ 2	score	items ≥ 2	score	items ≥ 2	score	items ≥ 2
cluster B	11	4	7	3	14	4	4	1	18	5	6-9	1-4
cluster C	6	2	4	2	6	2	3	1	6	2	4	2
cluster D	20	6	15	5	24	7	22	7	20	6	11-14	3-5
cluster E	18	6	14	5	17	4	4	1	21	6	10-13	4-6
total B-E	57	18	40	15	61	17	33	10	63	19	31-40	10-17
reduction ^b	17 ✓				28 ✓				32-23 ^a ✓			
diagnosis ^c	<i>positive</i>				<i>negative</i>				<i>positive</i>			

Notes: ^a Participant 4.1 scored 9 of the items on the posttreatment PCL-5 as falling in between two scores. Therefore a range is listed instead of a single score. ^b In this row the reduction in the overall score is listed, a tick signifies that the reduction can be considered as clinically significant and as evidence of trauma-processing. ^c In this row the posttreatment diagnosis is given (positive indicates that there probably still is a positive diagnosis of PTSD).

The qualitative data and their preliminary analysis

From participant 1.1 I received 6 pages with notes made on the days of her trauma processing, after the sessions (of imaginal exposure and EMDR). I read through her notes, identified a few themes which I wanted to explore with her in the interview, and also identified areas that were unclear to me and that I wanted to clarify during the interview. After I received the notes from her therapist I approached the participant and arranged the interview. The interview took place 16 days later, in Queeste, and took a little under an hour to complete. Thematic analysis of the participant's initial notes and the rough transcription of the recording of the interview resulted in identification of 5 themes (these themes were judged to be relevant with regards to the cognitive processing of trauma memories). They are:

1. *Impressions: fragments and overview*—related to the nature of the client’s flashbacks as well as to her description of shifts in perspective that occurred during her sessions.
2. *Tension and relaxation* (somatic)
3. *Allowing/surrender*
4. *Looking for negative cognitions*
5. *Freedom and Self-compassion*

From participant 2.2 I received 12 pages with notes made on the days of trauma processing, after the sessions (of imaginal exposure and EMDR), and also during the two week interval between the two treatment days. I also received a drawing, made two days after the final treatment day. Again, I read through her notes, identified a few themes which I wanted to explore with her in the interview, and also identified areas that were unclear to me and that I wanted to clarify during the interview. After I received the notes from her therapist I approached the participant, which proved difficult. After two failed attempts we arranged an interview via Zoom. The interview took place 23 days after I received the notes and took an hour and twenty minutes to complete. Thematic analysis of the participant’s initial notes and the rough transcription of the recording of the interview resulted in the identification of 3 themes:

1. *Impressions*
2. *Objectification and Insight*
3. *Self-worth*

From participant 4.1 I received 7 pages with notes (scribbled down in English and difficult to read). These notes were made in a diary over a period of approximately two months, after therapy sessions (they also contained a few unrelated notes). The therapy mainly consisted of CBT, but the therapist is also trained in psychoanalysis and combines the two in his therapy. The therapist sent me the notes and arranged the interview with his client. I read through the participant’s notes, identified a few themes which I wanted to explore with her in the interview, and also identified areas that were unclear to me and that I wanted to clarify during the interview. The interview took place at Queeste, 14 days after I received the notes, and the therapist was also present during most of the interview. The interview took a little more than half an hour and the spoken language was English. Thematic analysis of the participant’s initial notes and the rough transcription of the recording of the interview resulted in the identification of 3 themes:

1. *The experience of uncovering an experience that has been suppressed*
2. *Self-support*

3. *Empowerment*

Further analysis of the themes

Participant 1.1.

Impressions: fragments and overview. The participant noted after her imaginal exposure session: “I see the image of my trauma in “flashes”, snapshots of moments. Some details I remember exceptionally well, but there are also parts missing”. Later, she notes that she is “relieved” that she has “had the courage to link de memory (the snapshots) together”. After the first EMDR session she writes: “My image is a flash, a memory of something right in front of my eyes. Because of the session, my memory seems to expand [become wider] (it is like coloring in a picture). I see the space as it was, in all detail and even the nice things. I look at it from a distance, it has moved [her point of view]. It is no longer right in front of my eyes, but it is as if I look at it from above. It is as if I frame the image”. After the first EMDR session of the second treatment day she writes: “I see details that I didn’t see before.”

During the interview this was clarified further. Here follows an excerpt (in the excerpts of the interviews “P” refers to the participant, and “I” to the interviewer).

P: em, an example: I always had a flash of a concrete attic floor. Such a floor with a little bit of dust on it. Such a grainy type of floor. And I always saw it from up close, very close. [I: yes], that was a part of that trauma. And during the treatment, well, then I, let’s say, zoomed out. Then I first saw just that, just that little part of grey of that floor. And I also knew how that felt, that cold and dirty, that dusty...

I: So, let’s say it is purely the sense experience... (?)

P: Yes. Yes. Yes.

I: ... without anything else?

P: Yes, purely that, yes, sense, yes.

I: And then, let’s say, you say it is a very clear image, and also the feeling of dust

P: Indeed it is that grey, and also how that feels, that floor, that graininess, the dust, sand, you know. Also the temperature. So, yes: sense... and even the smell, a little moldy—moldy dust. That too.

I: Excellent. Okay and then it changes when you describe how these fragmented flashes—with all these different sense impressions—they simply become a whole?

P: Yes, it is as if I zoom out. So, first I see only that floor and indeed, including everything like how it feels and smells and, and. And at a certain moment it is as if I literally let’s say: distance myself. As if you are lying with your face close to the floor and stand up. So then I start to see the space. But also very detailed... I suddenly

knew the color of the curtain and, the sounds outside, and the smell of the entire attic. It is as if you stand up from the floor and have an overview. Even from outside the house, that I looked at the house from... as if I totally went out of it. And it really has been like that with all these traumas—that I, sort of, zoom out.

And here a similar example, related to another trauma memory:

P: ... That, I think is beautiful to emphasize that, that image was so narrow, a kind of tunnel vision. And then, during the treatment, one zooms out completely, on all fronts, but into minute detail. That, I thought, was the, um... weirdest, that I suddenly remembered everything. But to, to, to, up to the ground, to the smells to, to the sounds, completely nuts. As if in a kind of multifocus, hyperfocus, you suddenly remember the whole situation. I found that so..., well, I almost can't describe that. How detailed that, because I also had a trauma—well that wasn't done here [in Queeste], that was in Traumacentrum Nederland [another organization specialized in trauma treatment]—and it was when I was 4 years old. But even then—it was on a school playground—then I remembered all the sounds of those little cars the children..., and, and the murmuring, and the smell, and the touch of... I remembered it all. Up to the sand of the playground. Crazy.

A final excerpt from the post-session notes about the trauma memory after processing: “The trauma image no longer moves, neutralizes, and I see it through a frame (at a distance, from above), it's like as if I can walk around it”.

So, to summarize, during the treatment the quality of this participant's memories is extremely detailed, and, they consist of pure sense-impressions. The flashbacks she describes also have this quality of being extremely detailed sense-impressions. However, the flashbacks are fragments in which the context is missing. This context consists of the surroundings, which, because of the extreme tunnel vision, remains out of view, but also the context of what is happening. Elsewhere she describes how when she touches something cold in the fridge, this may trigger a flashback which has the same sense-quality. Such as the detail of the cold concrete floor she describes in the first excerpt. During treatment, the context comes in view. In the two excerpts she mainly describes the physical surroundings, which she remembers in great detail, but elsewhere she also describes other levels on which the context is restored. She describes this process as similar to zooming out. To summarize, before treatment the flashbacks are *fragments* of vivid, narrowly-focused *sense-impressions*. During treatment the rich, detailed sense-quality remains, but the larger context is established. This context consist of different levels. Here the context of the physical surrounding is

emphasized, but the participant also mentions an emotional, and a wider cognitive context. A note on the translation of the excerpts of the interview (the original language was Dutch): where I used the word “remembered”, the participant actually used the word “knew” (sometimes even in the present tense). Using “knowing” to indicate “remembering” is not unusual in Dutch, although there is also a word that literally means “remembering”. However, I want to emphasize that the participant chose to use “know” (and sometimes in the present tense), and not “remembered”.

Tension and relaxation. In a few places in the session notes the participant writes in rich detail about what is going on in her body during the session. Most of the times this is related to the sensations of tension and relaxation. At one point she writes: “Concentrating on the tension in my body and then eye movement [alternating eye movements during EMDR] is lovely, pain and tension simply disappears”. During the interview she also describes how she tries to regulate her fear of losing control during treatment sessions.

I think I can describe it best as,... the tension increases to the extreme. I feel like a kind of, a kind of pressure cooker. It is a kind of inner, yes, rage, a kind of storm in my body. And that is so intense that I, that I, sure, that I almost have the feeling that I need to throw up, or um... Yes, and how I then,... I don't really know exactly how I control that consciously, but I simply try to keep on breathing, to pay attention to my brea... and try... Yes, that's how I regulate it, I think.

I: Alright, so you concentrate on what is happening in the present and on your breathing?

P: Yes, but it is almost impossible to control. So, I really have the feeling that I want to run out of the door, or will start to tremble like... and that it is almost unstoppable.

I: So, it is kind of a fine line between... letting it happen and [P: yes!] ... trying to control it,... can I put it like that, or not? Or don't you do, don't you try that?

P: I try to control my, my panic, that, that, that, that, that steam that needs to escape, let's put it like that, I try to keep inside. Because, if I don't, I will run away.

I: Okay good. So there is something of a keeping it inside, but even so, you let it happen?

P: It is stuck inside of me. It can't come, or rather, it doesn't come out. I am very scared of that. So the tension rises and I keep that inside at all costs... to give an example. When I was at the Traumacentrum I also experienced that, that the tension rose up. And I would make an agreement that I wanted to be able to run out of the building. Then a therapist said “fine, then you can throw with clay, then it will come

out”. But then she couldn’t find clay quick enough (to throw against the wall) and I had already managed to bring it down. But then, when I do that—and I don’t know how I do it—but then it tends to totally cool down. Then for a moment, then I don’t feel anything anymore.

I: Okay, alright.

P: So, it rises up extremely, and when it has gone too far, so, when I can’t control it anymore, then it flows, then I feel it flowing away. But then I become completely cold.

I: Did you ever experience that you couldn’t control it, let’s say that it comes out? Or is that something you...

P: That has happened, yes. And then I am ... I was,³⁴... really lost...

This is followed by a description of how she finds herself back in a forest, without remembering how she got there. This is a symptom of dissociation.

During the interview I tried to zoom in on the moment during treatment when the tension transitions into dissociation.

I: So, I’m looking for... whether you remember if there is a transition... or, let’s say, you just said how you regulate it, there, then you enter in a dissociative state, you describe it as entering a state of hypothermia [this might have been meant figuratively]. So, how did... then you say well yes that feeling belongs to seeing the bigger picture. Do you know...

P: How that works? Well, that works...

I: Can you remember how that...?

P: Yes, that is also very physical. Then I really feel um... for example my muscles, my muscles in my shoulders relax. Everything goes down. I was always pushing my feet in the floor, and suddenly my legs relaxed. So, also, the, the, the tension goes down, because the EMDR, or the exposure, either one of them, works. That was also a very physical reaction. After that my head was groggy, a kind of brain fog. Just that it was too much, but I did notice it strongly in my body. That my posture changed and...

³⁴ During this last sentence the tone of voice of the participant turned neutral. She also corrected the tense with which she spoke from the present to the past. In most of the interview she spoke in the present tense, as if she was experiencing the things she was talking about at that moment. I interpret the change of her tone of voice to neutral and her switch from present to past tense as a distancing from an uncomfortable experience.

I: Okay, so, let's say, although you also say that you have a brain fog, at the same time you are very conscious of what is happening in your body.

P: Yes, then I really felt it going down. Really a spea- um a spring that is completely coiled up, let's say, and that you then really, that it simply goes down.

I: That is really something that, let's say, *happens* to you?

P: Yes.

Allowing/surrender. When the tension is less strong, the participant is able to allow and surrender to the process, particularly during EMDR sessions. In the notes that she wrote after the imaginal exposure session she writes: "Feeling of having to jump into the deep". This sentence is preceded by a detailed description of how her body reacted with tension to flashes of memories, and it is followed by a description of how, once she starts telling the story of one of her traumas she enters into a flow and details emerge that she didn't remember before. While this is happening she relaxes, sadness emerges, she cries a lot and she "can surrender to it, although it feels a little awkward". Thus, once she "jumps into the deep", she basically surrenders to what happens. Later, after the first EMDR session she writes, looking back at the process: "I lose control and overview, but I am conscious that this is how it feels and that I just have to do it, and that eventually I will feel relieved and liberated".

This was also confirmed during the interview. In the treatment center where the participant first went to treat her trauma, she had learned to trust the process, and that it is okay to surrender. She said: "There, everything was perfect, the circumstances were optimal to, to be able to be vulnerable. And that made that I did have the experience, that I knew, when one jumps into the deep, one lands safely". When I summarized this by saying that surrendering to the process starts with a conscious decision to allow it because she knew from experience that it would be okay to surrender, she fully agreed.

In her notes she also writes (after the initial imaginal exposure session): "Feel total surrender after the session, want to continue to the next, as quick as possible, because I am afraid I will close up again. I know that the treatment helps (experience) and hold on to that, chase away other thoughts like: this time it won't work, it doesn't work as well here as in TCN, etc."

Looking for negative cognitions. After the initial session (of imaginal exposure) the participant writes: "I notice that I am looking for "fear" in the memory. Almost seem addicted to "fearful images", look for self-blame and judgements about myself, but don't find them". After the first EMDR session on the final treatment day she writes something similar:

“... Notice that I am uncertain and investigate whether these new details are fearful. I notice they aren’t. ... Tension recedes and I can’t discover guilt/self-blame (and I was afraid that I would).”

When I asked the participant during the interview to elaborate on this, first the following conversation ensued:

I always avoided to think about the whole picture, but more like with that piece of floor, that rose up for example when I took a milkcarton from the fridge and that milkcarto was cold and I had an association with that cold floor. Look when I... with my hands... this table is cold, than the floor came, but I only saw the floor. That always was the fear, to enter completely into it... so that the floor is no longer just the floor, but also the beating from just before.

I: Okay, so, let’s say, the fear that one memory arises, that then the whole story....

P: Yes, that the whole story comes. And that I, that that is so intense... It is, of course, not for nothing that I only see the attic floor, and don’t know the rest of the story, or mostly don’t know. So I was very afraid of that. But then, when during the EMDR,... then you tell the story in a very intense way... and then I wasn’t... wasn’t afraid as I told it. And I found this so strange that I was looking within my memory: yes, but wasn’t this very fearful? O yes, but is isn’t, it isn’t fearful anymore. And that is very strange.

...

P: So, indeed, there are two fears. The fear that you will encounter all kind of things, because you suppressed everything and only see that little part of the floor. When that is filled in [with the missing pieces] it is even worse, and you don’t want to know. Plus, that in the moment you receive treatment and you zoom out, that you think: but this was very frightful, are there really no frightful parts anymore? Like that.

A little later the conversation returned to this theme at a deeper level:

P: But because you zoom out, it is as if I look at myself. While, before I was *in* the image. But because of this zooming out. Then you suddenly see... I saw myself ...do all kinds of things, and try, try to solve, and be utterly lost. And that part, I was never able to see before. Because I always remained in the image. So, that’s why, for the, for the first time, I see the whole picture and think: yes, from the beginning until the end, I did everything I could to get out of the situation, to save myself. To solve it. But no one would have been able to do that. So then that ebbs away, because I think that was always also a fear—but this I only realize now, with the knowledge I have

now—always the fear that, when the picture is complete: what was my part? Did I make this situation happen, am I to blame? I think that maybe that was also an important part of remaining within the image...

I: Not, not wanting to look at the complete picture, because you were afraid of what you would find?

P: Maybe, yes, that... yes, that is what I think now...

...

P: But, of course it was a relieve,.. zooming out, seeing the complete picture, and to think: yes, I was completely defenseless.

In this last excerpt from the interview, the participant talks about two different perspectives from which she experiences or looks at the trauma. Initially she experiences herself *in* the image—the perspective is from within the experience. This is what we have referred to as the *immersion* phase (de Wit et al., 2019; see also introduction and Appendix 1 for reference). When she “zooms out” during the session the perspective shifts. She sees the whole image as if from outside. She writes that it is as if she can walk around it. This phase we have referred to as the *inversion* phase (de Wit et al. 2019 and Appendix 1). This phase is not mentioned in the introduction of this study, apart from in the caption of Figure 5. In Figure 5 it is represented by the arrows exiting the memory and turning to it from the outside. During the inversion phase consciousness flips around—is inverted—and suddenly the perspective shifts from centered in the experience to peripheral. Although the participant doesn’t mention it explicitly, there is still another perspective, related to the first perspective. From this perspective only fragments from the perspective within the image are perceived—the participant referred to this perspective as tunnel vision. This tunnel vision perspective is the trauma perspective. Like the inversion it also creates a distance. But, this distance has a totally different quality. It is a distance of avoiding, of not wanting to know the rest of the image. After the inversion, the image is totally known. It has been experienced in the immersion phase and after the inversion the experience is *understood*. This understanding is the core of cognitive processing. In Study 3 I will develop this further, based on what has been discussed in Study 1.

Freedom and Self-compassion. Connected to the experience of zooming out, of seeing the whole image and of experiencing relief is still another experience. When zooming out, the perspective widens—becomes peripheral—and it is the *self* that *has* this perspective. The perceiving self has shifted its perspective from being within the experience, to looking at it from the periphery. One of the qualities of experiencing oneself *inside* the experience is,

that the experience is compelling to a high degree. It holds the self—as if—imprisoned. The only way to escape from it is to dissociate from it. The wider perspective on the other hand, has a quality of freedom, of liberation. This experience not only brings relief, it also brings other qualities, which are all qualities inherent in this widened experience of self.

In her notes the participant describes this as follows: “I can look at myself with compassion, see myself in the image and have compassion, I was not to blame, did not do anything crazy, nasty, or strange. I simply couldn’t have acted differently.”

In the interview we explore this further:

I: Then,... that brings me to another question, which is related to it. Um, in fact that image where you have zoomed out, um, you describe that from the level of sense perception too. [P: Yes!] Because you see... to the smallest details everything has become very clear: sounds, images, perhaps smells... Um, in addition to that, are there other feelings? Or is it pure sense perception...? Well, let me say it like this: you mention that you feel compassion for yourself. You experience relief that you are not to blame. Those feelings are already in addition [to the quality of sense perception]. Is there more? Or a quality that goes beyond sense perceptions... what makes um, that you, let’s say, in that wider overview um,... that you are free [earlier we briefly discussed the compelling nature of being *in* the image]... in that...um...?

P: Yes, it, um, I think it is best,... yes, it has been a while,... yes, as if I give myself a huge...hug...!

I: Okay, well, beautiful.

P: ... [continues sentence] in fact. Yes.

I: Yes. Good.

P: I really think that I, yes, yes, really, well there are no words for it really... But, really, that you suddenly look at yourself in that situation. And it really felt like that.

I: Yes.

P: Yes

I: Excellent. So actually you enter an area within yourself from where you can give yourself a warm hug.

P: Yes, Yes, really what I do with my own children as a mother when something nasty has happened to them. That you are completely there. Yes, that you support them, and that you do it with all your love, that you hug them. And, yes, in this case you give it to yourself, really... Yes, but also,... and then enters something that you think: how is it possible that I thought I was not worth this? That holds a judgement.

There I go again, but that is a bit how I am. But to be able think that [how is it possible that I thought I was not worth this?, the experience [of the hug, the compassion] was necessary first.

Participant 2.2.

Impressions. The flashbacks of participant 1.1 (discussed above) were pure sense-impressions. I referred to them as “impressions”. Participant 2.2 had experiences of a similar experiential nature—I referred to this experiential nature as “compelling to a high degree” and imprisoning. However, for participant 2.2 these impressions have a different qualitative nature than pure sense-impressions. The impressions are more of a *feeling* nature. Often the impressions also have a quality that brings them in close relationship to body-related feelings. In one note she calls it “a feeling of suffocation”. In another note she describes it as follows: “your breath becomes her oxygen and she is suffocating in cigarette smoke and wine”. In this last description the sense of suffocation is mixed with sense-impressions (cigarette smoke and the smell of wine on the breath of her abuser). This sense of suffocation is directly connected to the utterly compelling nature of these impressions and takes their coercive nature to a new level: experiencing them is like experiencing a life-threatening situation. There is almost literally no escaping them. In the interview I tried to explore this further, and the participant more or less described how this sense of suffocation was related to a man who had abused her and how it disappeared during EMDR. At the end, the images were further away—no longer “in her face”. She describes the quality of the traumatic memory *after* EMDR as follows: “It is a memory. So, something that just,... yeah, fleets past, but not, it no longer paralyzes me or makes me go into overdrive.”

There is also evidence of impressions of still another different level. There is, for example, the following poetic description of an experience:

You take your time,
as always and
force me into a
tight corner

This description still has a sense of suffocation (the word for tight corner in Dutch also invokes a sense of suffocation) and also of no way out (no escape), but there is also the impression of something very intentional. It is not merely a sense- or body-related impression the intention of the other is part of it.

There are also descriptions of the experience of alienation, of not being seen by her parents at a very existential level, written from the perspective of the child, that have the

quality of impressions... This deep experience of not being seen is simply experienced as a given (in the sense discussed in Study 1: “immediately given”). It is taken in and not understood. An example:

I am I no longer
where my knowledge ended,
the question begun.
How I think is wrong,
not understandable, so funny,
that she thinks that she
will never experience those
very normal things, that
she, a child,
resists so strongly.

The first three lines are from the perspective of the child . The next two are still written as if the child thinks this (it still uses “I”), but they are actually what she hears from her parents (about herself). Then the perspective shifts totally to the parents. She becomes “she” and we now read directly what they say/think about her. This is an inversion that is opposite to the one mentioned above (the experience of being in the image shifting to being outside it). Here the inversion doesn’t go together with a higher level of (self) understanding, but with a higher level of alienation (non-understanding). The perspective shifts from self to other (periphery). Self-understanding ends, because the voiced opinion of the parents is experienced as alien, as *not* reflecting the self. It no longer leaves room for the self. And the opinions of the parents become impressions, they are a “given”, but they are not understood (not brought in relation to the self). The context offered is not a context in which the I can recognize itself: “I am I no longer”.

Objectification and Insight. During treatment the experiences discussed as impressions above, are *perceived*—not just accepted as a given. When they are perceived, they become objectified. And perceiving them leads to deeper understanding. The lines “How I think is wrong, not understandable, so funny, that she thinks that she will never experience those very normal things” (see above) refer to the participant’s conviction as a child that she wouldn’t grow breasts or have her menstruation—that her body wouldn’t develop into a woman’s body. During an EMDR session she suddenly realizes that, as a child she was *utterly convinced* of this. Until then she knew it from the perspective of her parents and family: as an anecdote, a funny, child-like belief. She felt that this was wrong, but that was it,

she didn't understand why it felt wrong. By experiencing her own utter conviction as a child and contrasting it with how her parents and family had looked at her, she recognized that she hadn't been taken serious on a level where she needed it most. On the contrary, she had been ridiculed. And, as discussed above, this conflict between her own deep conviction and the way the world around her reacted to it, had alienated her from her self. Remembering (experiencing) her conviction, suddenly led to an understanding of the conflict, and the deep insight that she had not been taken serious on a fundamental level.

The alienation from her self increased to a whole new level when her body started to grow breasts and when she started to menstruate. Now she had the experience that "my body deserted me, betrayed [me]". The "congratulations" of her parents "on becoming a woman" augmented this sense of betrayal even further, but this realization only came during the treatment. She also shared during the interview that she now realized that she decided to see it as "failure" from her side, "I hadn't been able to meet my own expectations". She said that she was able to (first) experience, and t(hen) perceive this disappointment in herself for the first time during the imaginal exposure session.

By the end of the treatment the different levels of this betrayal had become clear to her: not being taken serious by her parents and family, being betrayed by her own body, the decision to classify it as a failure (and during the interview she said that she realized that by looking at it as her failure—by blaming herself—she was taking control of the situation), and not being able share her worries (about her body) with her mother. Thus, what was first mainly an experience: the anecdotes about her in her family, her feeling that this was wrong, but not being able to understand why, was gradually *perceived* during treatment and put into a bigger *context*. The alienation was recognized:

She is alone and
has always been
Where she
put her trust
she was found
invisible

Being able to unpack the alienation and recognize its multiple levels, led to understanding. This (as she said herself during the interview), "unfortunately" didn't resolve the core problem (which according to her is related to her self-image and gender identity), but it laid it bare and made it visible. She compares the processing during EMDR to the peeling of an onion. "Yes, it was, it was a little bit like an onion that is being peeled. The layers that

EMDR,... it really led to the shedding of layers that were badly damaged, what was also really necessary. Only, the core is something much more fundamental and much deeper rooted, while EMDR is more aimed at certain situations, and certain... what can be recalled very well (...)"

Self-worth. It had been difficult to get hold of this participant after her trauma treatment. An important reason for this was that she "fell into a whole" after the second treatment day. EMDR didn't prove to be the "cure all" that she had hoped for. As indicated in the last quote from the interview, it had merely helped her to unpack her deeper "core" issue. She showed some disappointment about this, and mentioned that she was depressed. While talking about one of her notes, she recalled a very positive self-experience that had occurred during the treatment, and that she had completely forgotten. This was a valuable experience for her. The note is as follows

I am the determination
of the value,
not the costs or
the exchange.

And the following excerpt gives a glimpse of the experience of self-worth that occurred during the session:

P: Yes, it is, it is ambiguous, it is, because it is also related to the second, second EMDR session, but that session had the same theme. Let's say of giving others control over, over um, over me and thus the fact that I can determine my own value, and that that has nothing to do with what I get back for it, or.... Yes, that, that is really claiming back my value, yes.

I: Yes, that is what I mean with self confirmation, in fact you confirm your value. You confirm your *self* really.

P: Yes.

I: And, was this, let's say, the result of the EMDR, or did you recognize it as something you already had?

P: It is something which was reconf...., what was confirmed again by the EMDR. I have to say that it is something.... I find it a difficult thing to always remember. I struggle a lot with it. But because, because, um.... Yes, because of EMDR I became, I felt strengthened in this. I have to say that I feel.... Yes, the fact that I have written that in this way after the EMDR is.... Is a direct result of the EMDR.

I: Yes, so, Can you tell me... um, ummmm. Yes, I'm not sure how you experience it, but if I speak from my own experience than I would say: at a certain level I am conscious that I am valuable, let me say it like that. Of what my value is. Independent of what, let's say, happens around me. But, um, during daily life that awareness is, let's say it is somewhere far in the background. Annnnd in certain moments—and EMDR can be such a moment—much falls a way and I become clearly aware of it. [P: Yes!] Umm, I am actually looking for how that is for.... Whether you still remember how that felt, um, or how you experienced that—let me put it like that.

P: Yes, it is... those two EMDR sessions that day were about men that... that I let take control of my value as a matter of fact. So what appeals to me here is, ...or,... I am, um... that I(!) determine my value. Regardless of what I receive back for it, or what I, what I, um...what others want to give in return. And that is something I realize in daily life, but, sometimes that value I give myself is very low. So, yes! It was something that, that,... was something that because of the EMDR presented itself very clearly. and I have to say that I completely forgot about it until we discuss it here. And now I realize: yes, that was really very, very deep and a beautiful feeling. A very,... a kind of revelation. But, because so much happens during EMDR, it apparently slipped away.

I: Yes. Yes, okay.

P: Yes, Yes it is... a result of the EMDR has anyway been that those situations no longer, so, those situations and those people in those situations no longer control my life to such a degree. Regardless that they actually don't control me at all, but, that it is something in my head, but the fact that I, I write here that I can determine my value is quite a revelation, and it really *is* a result of the EMDR. So, yes, that is a result of EMDR.

I: Can you still reach that feeling, when you, when you, let's say, return to that session in your mind?

P: Yes, because first, first I describe, when I write: "You take your time, as always" and that, that is still really about that person, and thus really focuses on the other. Until I suddenly make a U-turn... and use a new page—while it is all written within a few minutes—and then it is suddenly about me and no longer has anything to do with the other. And the... But that is how fast it happens during EMDR... it flips around

constantly. So yes, I can recall that feeling in my mind. Huge relief—something like that.

Participant 4.1.

The experience of uncovering an experience that has been suppressed. When filling in LEC-5 participant 4.1 reported that she had witnessed someone else (her sister) being sexually abused (as a child). During the treatment (CBT with elements of psychoanalysis) she realized that she herself had also been sexually abused. It was not clear from her notes whether this realization was a result of the therapy, so I asked her directly during the interview. She confirmed that the realization happened during therapy, and following this we explored the exact nature of the realization. Here follows that part of the interview:

Well, the first question I have is... maybe I'll just read out the question. And it's not really clear from your notes... if it's an appropriate question or not, but did you remember the abuse you suffered before you started, before you started the therapy or did the memory come up during the therapy? That wasn't...

P: Eh, the, the worst kind of abuse that I think has left the most lasting effect on me, I did not remember until I did. And saying remembering is also like I would tread very careful with that. It's more like it's like it's a film that has become a lot more clear. And before that it was just a song that felt very intense.

I: Okay.

P: So it's more like it. I cannot remember it perfectly. And I cannot say 100% that that's the memory of how it happened. But somehow the words just came out of my mouth.

I: Yeah,

P: I don't, I've never, that's never happened to me. So that's why I am convinced that that happened to me. But it was during the sessions that it became more obvious and it was the first time that I had a safe space to actually say the words because it's almost like this dirty secret that I've been keeping inside of me that has been so blurry that I was, as alw... like with everything in my life, I was denying myself that luxury of allowing myself to feel the pain that it has really happened.

I: Okay, so that kind of answers my question straight away and I got the impression from reading your report but it was not really clear. So that's why I want to make that clear.

P: hmmhmm

I: Okay. Then those questions are all actually already answered. So just to clarify a little bit in- initially you write about physical abuse. And in the end, you write about sexual abuse. And this is the part which became clear during the...

P: Yesyesyes, the, the physical abuse and mental abuse. I already said in the beginning. It's, it's, it's the most clear memory of my childhood.

I: Yeah,

P: It's actually all the abuse that I've ever suffered: the physical and the mental abuse. Whilst my happy memories are very vague, very far apart, and most of the time are in relation to my grandparents.

I: Okay. And so, the part about the sexual abuse just came up, like, you just said.

P: In detail like that. Given space. Yes. It was through therapy. Ja

I: Yeah, okay.

P: Ja

I: Good. Can—o yeah you said already a little bit about it—you describe..

P: I just wanna clarify one thing. That again, the feeling that I was sexually abused was in the back of my head.

I: Yeah.

P: it was always a feeling that I felt inside but I was always too afraid to give it space. I just want to make sure that, that's clear.

I: Okay. Yeah, and so..errmm

P: It's not that I started therapy and all of a sudden I was like, oh, something like that happened to me.

I: No. Okay. That's okay. So can you say a bit more about that? You already described it in a way in quite a poetic way about...eh, eh.. you refer to a song and suddenly it became like images.

P: hmmhmm

I: Yeah, it's a beautiful way to describe it. I think. I don't know. Is there anyth.. So maybe we can, could we try to look a bit at the quality of that memory, how that changed? You don't have to talk about the contents. Just,

P Jajaja. It's, it became way, way more powerful. Like, it just became it just became *real*. It's, the words came out and it it's like when you have that inner child in you that's always been really scared of something and not knowing why I'm so scared of these things. Why do I, why do I hate seeing if Lily starts playing with strange men? I, internally I go into like this rage, you know, like, and then I'm, like, why am I

feeling like [name of perpetrator] was here, is here? I'm here. It's a safe space. Why do I hate that? This father also who we were in the play.... that is playing with my daughter and it makes me feel extremely uncomfortable. The first thing that goes through my head is like, he's a pedophile, right?

I: Right

P: So things like that, have become way more real to me. Because I can put words to it, so the memory...

I: You understand it better.

P: Yes, exactly. I understand why, where my, all my insecurities come from and where that pain, and the frustration and annoyance, you know, and the, ja the difficulty of it. So,... and strangely enough, sometimes I still have like, flashes of memories like just random memories from the sexual abuse.

I: Yeah.

P: Which has never happened. Until I started the therapy, and I started opening myself up and, giving myself, allowing myself to accept my pain.

I: Okay, so that's kind of clear flashes then.

P: Yeahyeahyeah. it's like, like really, it's like takes take me. Where is it? Jesus Christ. Were, you know, like that.

I: Yeah. So, on the one hand to understand your reactions better and they start to make sense, like what you refer to is is that your daughter?

P: [Name of daughter] is..

I: Yeah. Okay. So, your reaction start to make sense in the light of your memory and on the other end, you have like clear flashbacks

P: Yeah.

Thus she is careful to describe the exact nature of the memory of the sexual abuse. The memories of the other abuse (physical and mental) are very vivid—she describes them as the clearest memories she has of her childhood. The memories of the sexual abuse are of a different nature. Later in the interview she briefly describes how it was before the therapy: “my memories as a kid are so vivid, they're extremely vivid and the memories that I had of the sexual abuse. That's the weird thing. It's a fucking blank. It was a complete blank up until when we first started talking about it. Except that the feeling was still there.” So, before she started to talk about the sexual abuse during therapy she *felt* it had happened—and in the first excerpt she also implies that she *deduced* it from her reactions to men playing with her

daughter, but there were *no* impressions, no flashbacks. Apart from a feeling, and her reactions she had no *awareness* of it—it was a complete blank.

Once she allowed herself the space to talk about it during therapy, she was able to give words to it: “somehow the words just came out of my mouth”. The way in which she describes it suggests that she still hasn’t *fully* acknowledged the experience (what I referred to as *immersion* has not yet occurred). The “experiences” still exist in—what I would like to describe as—a *peripheral* manner. They can be accessed, and impressions of these experiences have started to emerge into consciousness (flashbacks), but they are not yet fully owned. The participant has not yet fully taken hold of them *as* experiences. To use a turn of phrase used by participant 1.1, she has not yet found herself *inside* the story or the image. The story hangs *around* her. She senses it. And, since she has allowed it to talk *through* her during therapy, images have started to enter.

At the end of her notes—written at the end of the processing that was part of the research project—she is able to give words to her feelings in relation to the abuse. She is trying to find a relationship to what has happened to her as a child. She writes:

I wish she would have just died there so the torment, pain and anger would end.

She abused us by not acknowledging us for being children.

I think of the condom I found . How did I know what it was???

I have a huge knot in my throat.

An... it. I want to Say Something but I just can’t find the words for what happened

I want to scream it out. “I was Sexually abused as a baby girl”.

Self-support. In the middle of her notes the participant writes about her guardian angel:

The guardian angel helped me out So much. like a coping mechanism. I always thought it was my imagination. Now I understand it was always me that was there for me. I feel so light and relieved and happy to be me

We unpacked and explored this in detail during the interview:

So then we move on to your writing about your guardian angel. And can you tell me, just can you tell me a bit more about what happened during that session?

P: During the session? Oh you mean, like do you want me to tell you about my guardian angel? Do you want me to tell you about the context of it?

I: Yeah, the context to start with. And then maybe about... so, I had the feeling you were talking about your guardian angel referring to the past.

P: Yeah, yeah, yeah.

I: And then starting to make sense of it in the present.

P: Yeah..

I: That's my feeling of what I got from...

P: It may be a good thing to first say is that I'm Romanian and we're Or- or Orthodox.

I don't know if it's Catholic or Christian, Christian Orthodox?

I: Yeah: Christian Orthodox.

P: And when I was a little girl my grandmother always wanted to,... every night we had to pray to Jesus Christ and to our guardian angel. And even to this day, she really still very adamantly beliefs in them and I think, through praying to this guardian angel, it made me feel like there's somebody protecting me and by my sides because I never had anybody there. So in a way it was me creating this. Really believing that this guardian angel is literally always by (I: yes), behind my back. Always trying to be there for me. And especially as a little girl, it became like, almost like physical, you know. Like, it was really like an imaginary friend that was a support to me. And, whenever something, when my mom had a huge fight with her boyfriend or really something dramatic would happen, I would always, at night, pray to the guardian angel and then talk to my guardian angel like, and then, you know to comfort me. And for me, they would see no...

I: yeah, do you remember kind of the ages you had then?

P: Oh yeah. Of course, I was very young. I mean, I've been praying to Jesus and to at the time to this guardian angel, since I can remember, you know. But I think I was very young. I think I was doing it up until the age that I was like 13 or 14.

I: Okay.

P: And I would even believe still in Jesus Christ, and God up until I was like 21.

I would even say almost as—Actually,... I turned 18 and I got guardian angel tattoos on my back, like a form of making it real, more real... And you know, honoring the guardian angel that it had been my support that whole time and I also didn't want to forget whatever, what had happened to me. So that I think was another way of...

I: So if you say, when you say I didn't want to forget what happened to me, you mean, including your guardian angel? Or...

P: yeah, I think my guardian angel was kind of like, part of the whole story of the whole trauma that had gone on. I think, at that point it was kind of like before all the psychological abuse started from my mom's new husband, because that was like a whole other beast. But before that type of psychological abuse really started. We had

moved back to Romania from America and that was kind of like the moment where I said, I'm old enough. I want to get this tattoo because I don't want to forget what I had been through.

I: Okay

P: Or, yeah, I didn't want to forget the guardian angel.

I: Yeah. All right. So then you write that you, ... you talk about it as your imagination and a coping mechanism.

P: Yes.

I: Yeah.

P: Most definitely, yes

I: Yeah. So that's kind of looking back at it. And then “now I understand it was always me that was there for me”. You write that...

P: That's true, yeah... That was a big revelation in that session. I'd never really thought about it. Because once I came to the Netherlands, although I was still struggling a lot, I think by that time, I'd become an adult and all the abuse had kind of like, made this neat layer of insecurities, and pain, and patterns, and unhealthy patterns and toxic patterns. But I was still much happier. I was at the happiest and I still am at the happiest I've ever been in my life up until now because I met my husband and it was a way of us being there for each other, him with his trauma, as a kid, me, with my trauma, as a kid, but us being able to move past it and just live our lives for the first time. So that's when I stopped believing in God and Jesus and my guardian angel.

I: He came to...

P: Yeah. Then I became an adult.

I: No. I mean he came into your life as your partner.

P: Yes. Yes.

I: Yeah, okay. Can you say a bit more about what you mean with “it was always me who was there for me?”

P: Oh yeah. It was a, it's so strange. It's like, now I realize that there's always been to two parts to me, were one part where I had the capabilities of being a support for myself, but then still being that very scared girl. And I really do believe now that that guardian angel was just a way for me to synthesize my, my capabilities of being able to comfort myself.

I: hmmhmm

P: because I didn't learn comfort from my mom or from her boyfriends. I learned some comfort for my grandparents but that was four weeks out of a year. So it was something that I had tried to learn for myself, that was working at the time.

I: And so what happened during that session, [P: I started to cry] is there any, is there any way any way to kind of get to describe how this realization came about?

P: In the world. Well, I always say that [name of therapist] is making me cry, so he was trying to make me cry. So we were talking about the, the guardian angel about the story and then you know I just, like, talking and talking and then it just kind of started wheeling into, words coming out of like it was more like just a *aha*. I was like oh shit. Yeah of course I think it's also because now I'm like: "emotionally, intellectually developed". So I could be able to make the connections. But I think before, you know, I didn't, I wasn't so connected with myself and I guess you could say, I didn't have enough, I didn't have the self-confidence to even make that connection.

I: So, so [P: but now I have that] during the session you were talking about it and you came into a kind of a flow and then...

P: It was like, yeah it was like a wheel, I'd say it's like a wheel you kind of talk, and it's like, a lot of the times I know that [name of therapist] is there and he's listening, but it's my, it more feels like, I'm just kind of talking to myself and then I'm like, oh yeah. Oh yeah, oh yeah. And you know, you talk about something you haven't experie.. That was another big thing. I hadn't talked about my guardian angel in over 10 years and then it was, talking about it and understanding it better. So, I think it's also the therapy, being connected, and giving space to myself healing, but it's also rediscovering it that I was at a different mental... Intellectually at a different level emotionally than, how I was 10 years ago.

The way in which the participant talks about her relationship with her guardian angel in connection with the development of her ability to support herself can also be seen as a development that moves from the periphery to the center. Initially, when she is very small her grandmother teaches her to pray to her guardian angel. She describes that her guardian angel becomes very real to her, like an imaginary friend. He is the only one she can talk to and that she feels supported by. To use a term from attachment theory, instead of her primary carer, the guardian angel becomes her *safe haven*. Then, when she grows older she wants to hold on to her experience of her guardian angel by having guardian angels tattooed on her back. She says "to make it real, more real". Thus, from being experienced as being around her (in other

words peripheral to her), the guardian angel is tattooed to her back. Then, after not having given it a thought for more than 10 years, the memory of the guardian angel and the role it had played in her life suddenly re-emerged during therapy, and she realized that “it was always me, being there for me”. She not only realizes that she *now* supports *herself* (support is now experienced coming from the center of the self), it has *always* been she who supported herself. Only, when she was younger, her self supported her *through* the imaginary form of her guardian angel.

Empowerment. Exploring the role of the guardian angel in the life of the participant and how the support she first perceived as coming from her guardian angel became internalized and centered in herself, quite organically led us to talk about empowerment:

I: So when you were a child, you had this guardian angel and it played a very important part in how you could kind of deal with, what was [P: cope] happening. Yeah, cope. Then during this session, you realized that it was you. So that's kind of a very empowering experience.

P: Yeah-yeah-yeah, it *was* a very empowering experience yeah.

[...]

I: But yeah, like I said it's,... also I don't want to put ideas in your...

P: No, no, no you're not putting and I will be very honest [I: in your head]. Again I think that it was a big aha moment, but I've had a lot of aha moments.

I: Yeah

P: and it was also a lot of other moments and I think with [name of other therapist working with speech and drama] the work that I do also is on the side. That's what I said that for me, it feels that that's giving every, you know, like I said, it's like an octopus and there's all these flailing arms coming out, you know, and there's all these you're being bombarded by all the memories that you've had and you're trying to work through all of it at the same time, everything around you in your day-to-day life, affect you even more to a certain extent and then a little bit through time. Can you start controlling all those octopus arms?

I: Yeah, I'm not like what you said in the beginning before we even started.

P: Yeah so I think the guardian angel is just one of those Octopus arms, has just been flailing around, you know, but now I get like, kind of centered and I can have better. I: yea exactly. Yeah] I can interact more as my true self [I: yes] rather than... So this this memory it's important but there's so many things that I'm having aha moments with, [I: Yeah] that's allowing me to be my authentic self.

I: Yes. So that's actually maybe more close to my real question. Not necessari... Look I made the connection to this guardian angel, but especially because you said, then after it's now I understand it was always me that took care of myself. That's a very kind of it is very, very empowering.

P: It is very empowering and you,... like I said I'm going to have extremely difficult... A very difficult, very confronting conversation with two very abusive managers at my work. [I: Yeah, exactly]. I would have never been able to do that. I wanted to quit my job when I first started and I was like, fuck it, you know it I don't need this. And now I've been looking for their jobs, but nothing's interesting to me. It's because I know, I don't want to leave this company. Yes. Not because the job is incredible and the pay's great. Because it's not. But because I want to fucking make space for myself.

I: Yes, honor yourself...

P: honor myself also, but get my revenge so to speak. Maybe that's not the right, the best way to do, but for part of it, I want to be petty and I want to be very direct and I want to make sure that I'm going to be heard from the from the higher up. So they know exactly how things have been going. And also stand up for myself and I think that's the biggest thing I've always been extremely scared of: standing up to myself. [...]

P: And now I, okay, very matter of fact, I'm putting myself on first place for the first time in my life.

I: Yeah.

P: And I never understood what that meant. Everybody kept saying, you know, you're the most important, your health is the most important and what does that mean? I didn't know what it really meant, how it felt. It's almost like I was blind to what those words even mean. But now, I'm doing it and it feels great.

So, once more, especially when she talks about octopus arms as an image of all the areas in which she is working on herself, all the areas that support her in this work, there is the movement from peripheral to central. She is feeling that she becomes more *herself*. At the time of the interview, she was actually beaming with newly gained self-confidence, in the way she talked about standing up for herself. She was not entirely convinced of herself yet, though, because she still perceived herself as in need of a lot of therapeutic support in order to be able to keep up this newly gained self-confidence (she compared herself to an

addict, that might slip back into negative habits, if she did not keep working on herself and looking for therapies to support her in this).

Discussion

Exploring the inner experiences shared by the three participants that took part in the initial part of this study revealed different aspects of the processing of traumatic experiences. Even though the results discussed above are based on the reporting and interview data of only three participants, a larger image already starts to take shape. A rough distinction of the different stages on the road that leads from being traumatized (i.e. suffering from a conjunction of trauma-related symptoms) to being healed (which minimally means no longer suffering from a conjunction of trauma-related symptoms) is already beginning to reveal itself. The first stage is the pre-processing stage, the second stage is the actual processing stage, and the third stage is the post-processing stage. These stages can present themselves at different levels at different parts of the road. Even when a person is still suffering from trauma-related symptoms, on some levels aspects of the post-processing stage can already reveal themselves.

In the *pre-processing* stage the inner experience of trauma is that of intrusions, or of what perhaps can be best classified as a general “apprehension” of something having occurred. These intrusions and apprehension have a quality of *impressions*. These impressions can be entirely sense-related, as in the example of the flashbacks of participant 1.1. They can also be related to feeling—either body-related feelings (perhaps mixed with sense-impressions), or feelings based on a more complex social context, often mixed with foreign cognitions³⁵—as in the example of participant 2.2. The apprehensions are also impressions, but they are *felt* (meaning that the subject knows of them because a feeling emerges when they are “sensed”, they are not of a sense-perceptual nature), or deduced from recurring reactions to certain situations—as in the example of participant 4.1. Impressions can also be missing altogether and leave a “blank” where they *should* be (as in the case of participant 1.1). Finally, *previous cognitions* can also be impressions. This has not been discussed in the results. There may have been a few examples of such impressions, particularly in the case of participant 2.2 (for example her mental construction of her body developing into a women’s body as a personal failure), but they weren’t discussed explicitly.

³⁵ With foreign cognitions I mean cognitions that are not comprehended by the subject—they are like sense impressions: they present themselves to the subject as a given.

Self-beliefs are a good example of such impressions, but they weren't encountered among the available data from the participants.

The exact nature of impressions can be approached by looking at Rudolf Steiner's definition of what is translated into English as a *percept*. As stated in the introduction to this study, and elaborated in more detail in Study 1, Steiner defines a percept very concisely as the "immediate experiential content apprehended by the conscious subject through observation" (Steiner, 1995a, p. 62). Based on Steiner's definition, impressions can be defined as the immediate experiential content *not* apprehended, or *before* it is apprehended by the conscious subject through observation. One could also say that the immediate experiential content apprehends the subject, instead of the other way around. Observation means that there is an *object* of observation. In other words, what is observed is objectified. Objectified means that there is a separation of subject and object. Impressions are *not* objectified. They *invade* and *overpower* the subject. In the case of apprehensions they remain largely *invisible* to the subject.

During the *processing* stage the subject immerses themselves at some level in the "immediate experiential content". In some forms of therapy this immersion is approached head-on, in other forms of therapy the process is controlled more carefully. In SE for example the immersion is only allowed to proceed very gradually through what Peter Levine calls "titration". This is to avoid retraumatization (Levine, 2010). Participant 1.1 referred to this stage as being within the images, or the story. During this immersion the subject engages with the immediate experiential content and parts of it become objectified. The "immediate experiential content" is now *actually* "apprehended by the subject through observation." This can involve what we have called the *inversion* phase (de Wit et al., 2019; see also Appendix 1), where the subject actually emerges from the image, or the story and looks at it from the outside. But this process can also be more subtle. Once the immediate experiential content is "apprehended by the subject through observation", the *actual* act of cognition can occur. Now *thinking* brings forth the conceptual content that best fits the immediate experiential content, and *understanding* ensues as percept and concept are united (this has been explored in detail in Study 1). This process of understanding can have many levels, from understanding the immediate context of the traumatic event, to the effect of the traumatic experience on the self, to repercussions of the effect of the trauma on the self, to a deeper understanding of the self due to the cognitive processing of negative cognitions about the self that are understood to be false. Understanding is the temporary or final result of cognitive processing of a traumatic experience. To the level to which the traumatic experience is

understood it is now permeated and understood by the self in a comprehensive way. The experience of self-compassion, self-worth, self-support, evidenced in the reports of the three participants, accompanies this understanding. Forgiveness and love can also occur at this stage, although they did not occur in these cases—but forgiveness was for example reported by the participant in Study 3 of the master part of this project (de Wit, 2019)

Finally there is evidence of a *post-processing* stage. Traumatic experiences overpower the self. It perceives itself as not strong enough to uphold itself in front of these experiences. This means that to the extent to which the self cannot restore its rightful domain—let's roughly summarize the self's domain as body and mind—it loses not only control over what is rightfully its own, it cannot properly use them anymore to work in the world. It's *agency* is compromised. Processing the traumatic experience restores the self's agency. As a result the self can continue to develop itself appropriately, while before this development was at least partly arrested. This restoration—at least the partial restoration of agency—is clearly demonstrated in the empowerment experienced by participant 4.1.

With regards to the nine phases described in de Wit et al. (2019) I can be short (see Appendix 1 below and Figure 5 above). The intermediate results of the present study show evidence of what has been called the *immersion* phase, the *inversion* phase and the *insight/epiphany* phase. None of the participants reported experiences that can be interpreted as evidence of the *association* phase or the *transliminal* phase.

Conclusion

This study used a phenomenological approach to investigate the first-person experiences of three women as they underwent therapy to treat PTSD symptoms. It only investigated the inner experiences that occurred while traumatic memories were being processed. Although their symptoms didn't completely recede as a result of the treatment they received, their improvement was clinically significant. This was taken as objective evidence that trauma-processing had occurred during the part of the treatment under investigation. The phenomenological approach proved valuable in investigating the inner experiences of the participants. Thematic analysis was used to distinguish and organize the salient experiences. The observations of the participants were used as the observational data, initially without allowing existing theories to interpret the data. Thus, the observational data provided by the participants became the observational content of the first step in the act of cognition described in Study 1. Three stages revealed themselves in these observations. A pre-processing stage, a processing stage and a post-processing stage. The first two stages

were recognized to be directly related to the act of cognition itself as described in Study 1. In the pre-processing stage *impressions* related to the traumatic experience *intruded* upon the first-person experience of the participant. The participant did not engage with or apprehend these impressions, they were foreign to them. During the processing stage the participant immersed themselves in aspects of the experience of these impressions and the act of cognition could unfold. The impressions were apprehended, and perception of what was given led to understanding and insight. In the third stage the participants agency, that was impeded by the traumatic impressions, was (partly) restored. Self-worth and empowerment were notably increased.

Thus, the act of cognition, as investigated and described in Study 1, proved valuable in two ways in this study. First, it informed the overall methodological approach of this study, since the Goethean phenomenological approach *follows* the act of cognition and strives to remain true to it. Second, elements the act of cognition could be recognized in two of the three processing stages identified in this study and understanding the act of cognition proved valuable in understanding the processing of traumatic memories.

Figure 7

Untitled



Note. Drawing made by participant 2.2, a few days after finishing her trauma-treatment. Reprinted with permission.

Study 3

Nacht-Stilte

Stil, wees stil: op zilvren voeten
Schrijdt de stilte door den nacht,
Stilte die der goden groeten
Overbrengt naar lage wacht...
Wat niet ziel tot ziel kon spreken
Door der dagen ijl gegons,
Spreekt uit overluchtsche streken,
Klaar als ster in licht zoû breken,
Zonder smet van taal of teeken
God in elk van ons.

P. C. Boutens, 1909

Night-Stillness

Still, be still, on silver feet is
Stillness striding through the night,
Stillness that delivers tidings
Of the gods to nether watch...
What not soul to soul could speak
In the tenuous hum of day,
Speaks from overearthly regions
Clear as star in light 'd be broken
Never stained by word or token
God in every-one.

Understanding Trauma

Introduction

What is trauma?

The word “trauma” originates from classical Greek and means “wound”. It has been used in the English language since the 17th century (“Trauma,” n.d.) and for two centuries only referred to physical wounds. In the late 19th century its usage started to include the idea of wound in the sense of *psychological* wound. The *New Oxford American Dictionary* defines the related word “traumatize” as: “subject to lasting shock as a result of a disturbing experience or physical injury” (“Traumatize,” 2015), thereby combining the physical and psychological definitions of trauma. *Stedman’s Medical Dictionary* defines “psychological trauma” as: “An emotional wound or shock that creates substantial lasting damage to one's psychological development, often leading to neurosis.” (The American Heritage, 2002).

Introducing the concept of “shock” doesn’t offer much clarity: physiological shock is well defined, but what does shock mean on a psychological level? Equally, what is a *psychological* wound, or (lasting) *psychological damage*? Recognizing and defining a physical wound is relatively straightforward: a physical wound can be observed (providing it involves the surface of the body). Furthermore, the circumstances leading to a physical wound will lead to a wound in virtually everybody that encounters them—e.g. everyone who gets cut with a knife under similar circumstances will be wounded. A cut with a knife damages the physical body, and a physical wound can be defined as a disruption of the integrity of the physical body. Psychological wounds are not nearly as straightforward. They are not visible, and circumstances that lead one person to develop symptoms of “traumatization” are not guaranteed to lead to similar symptoms (or *any* symptom) in another person that encounters them. Psychological trauma is inferred from observable symptoms, but under normal circumstances it cannot be seen or proven with a similar degree of tangible certainty as physical damage.

In this study, I will begin by briefly tracing the appearance and the development of concept of psychological trauma. It’s initial appearance can be traced back to medical discourse related to litigation involving railroad accidents. Initially, physicians involved in such cases as expert witnesses tried to explain symptoms that presently would be considered an indication of psychological trauma as resulting from physical trauma. However, gradually a more psychological explanation gained momentum. Since being introduced in the late 19th century, psychological explanations of psychological trauma have mostly gone hand-in-hand

with physiological explanations. And most of the trauma models that have been explicitly or implicitly proposed contain physiological as well as psychological components. More recently, the increasing influence of neuroscience on psychology has given rise to a trend in which also the psychological components are more and more explained as resulting from physiological processes. Overviewing the theoretical trauma models that have been proposed over the past century-and-a-quarter one could say that the concept of psychological trauma emerged out of purely physiological ideas and presently appears to return to such ideas. This tendency can probably be seen as a symptom of a much larger development, in which psychological realities are more and more reduced to the physiological processes from which they are hypothesized to emerge.

Recounting the history of trauma would be too large an undertaking to fit into this study. Therefore I have chosen to describe in some detail a trauma model from the second half of the nineteenth century that still tried to explain trauma as a physiological injury. This model emerged directly from litigation involving railway accidents and was developed by the British physician John Eric Erichsen. Following this description I will give an overview of several trauma models from the end of the nineteenth century and the beginning of the twentieth century that included psychological aspects. After describing these models, I will review some of the important developments related to the understanding of stress and emotions—particularly fear—that occurred during the twentieth century. In this part, one of the fruits of early cognitive psychology will also be covered—i.e. the importance of cognitive appraisal in the experience of stress and emotions.

Before proceeding to outline the trauma model I have developed based on my own research, I will review some contemporary trauma and trauma-related models.

From railway spine to shell shock

The railway spine

The first theoretical models of what we now know as psychological trauma originate in attempts at making sense of symptoms displayed by victims of railroad accidents in the mid-nineteenth century. Initially these theories focused predominantly on organic factors, but by the end of the century medical opinion was split as to whether the symptoms were caused by psychological or by organic factors³⁶. Not only medical opinions were involved in the

³⁶ A third opinion was that many railway accident victims were exaggerating or simulating their symptoms in order to receive compensation from the railway companies and that there was nothing really wrong with them.

elaboration of these theoretical models, legal, political and economic motives played an important part too.

Railway travel—a direct product of the industrial revolution—was one of the first phenomena in which a significant part of the population was introduced first hand to the new magnitudes of experience opened up by the emerging age of the machine: bulk, speed, and... mechanical vibrations. Travelling at velocities not known before, in big machines built of metal and wood—machines that spewed smoke and fire, that produced loud, unnatural noises, as well as sudden jolts and almost continuous rapid mechanical vibrations; machines that were able to transport large amounts of goods, animals and people over land – these were new experiences for humanity.

Initially, during the early nineteenth century, railroad travel not only generated serious concerns about the effects of these new physical experiences on the human organism, it was also associated with a strong sense of direct danger – the fear of accidents was considerable. The following excerpt is exemplary of first-person accounts of railway travel in the nineteenth century. In a letter to his stepdaughter, written in November 1829, the British MP Thomas Creevey wrote the following words after having been invited to take part in a test-run on the Liverpool to Manchester Railway:

I had the satisfaction, for I can't call it pleasure, of taking a trip of five miles on it, which we did in just a quarter of an hour – that is twenty miles an hour. (...) we went at the rate of 23 miles an hour, and just with the same ease as to motion or absence of friction as the reduced pace. But the quickest motion is to me frightful: it is really flying, and it is impossible to divest yourself of the notion of instant death to all upon the least accident happening. It gave me a headache which has not left me yet.

(Maxwell, 1904, p. 204)

By mid-century, as people got more used to train travel, some of the early concerns were subsiding, while the associated sense of danger lost its prominence and slowly moved to the background. It didn't disappear though, in the face of disaster it would quickly rise to consciousness – both individual and public consciousness. It was a ghost that haunted railway travel for much of the century (Harrington, 2001; Schivelbusch, 2014).

Railway accidents were frequent in the nineteenth century. In the first part of the century the majority of these accidents involved explosions of steam engine boilers. Due to improved manufacturing procedures by mid-century boiler explosions were in decline, but simultaneously, as railway networks spread and the trains' velocities steadily increased, the

frequency of deadly collisions and derailments rose rapidly ("List of rail accidents (before 1880)," 2018, March 14; Schivelbusch, 2014).

With the frequency of accidents, litigation against railway companies rose steadily. In Britain, Lord Campbell's Act, which was passed in 1846, allowed relatives to claim compensation for passengers killed in accidents and allowed injured passengers to claim compensation for their injuries and for loss of income. The railway companies were held liable for the negligence of their employees, to which the majority of accidents was attributed. By the 1860s the grand majority of personal injury claims resulted in compensation and there was a growing sense that claimants frequently exaggerated their injuries in order to increase compensation. Impairments that were predominantly *functional* in nature – that is: without a clear physical injury – were considered particularly prone to exaggeration. Due to the lack of clear physical injuries, evidence for such impairments was circumstantial and relied mainly on personal testimony and on the reports of medical experts. Because of the increasing suspicion of exaggeration, and because of the inclination of the courts to reward most claims, the railway companies began to employ their own doctors and regularly resorted to the use of private investigators to assess claims (Harrington, 2001). The disputes in court between medical doctors employed by the railway companies and those testifying on behalf of the claimants were increasingly viewed as discrediting the medical profession as a whole, and the need for a comprehensive investigation of the medical implications of railway accidents became “a professional as well as a medical priority for many doctors” (Harrington, 2001, p.39).

“Secondary effects” of railway accidents

Publications about the influence of railway travel on human health started in Britain in the early 1860s, and within two decades some of the great names in European medicine were involved in the discussion.

The first report considered here was originally published in eight parts in the medical journal *The Lancet*. The eight parts were published separately between January and March 1862 under the common title “The Influence of Railway Travelling on Public Health”. Three months later the full report was reprinted as a stand-alone pamphlet with the same title (The Lancet, 1862). The Lancet report covers a wide range of health risks associated with railway travel—not just accidents. It deals quite specifically with the effects on the human organism of phenomena such as the train's velocity and its continuous mechanical vibrations. The report summarizes a number of actual cases of ailments due to railway travel and railway accidents as examples. To illustrate the relevance of the report to mid-nineteenth century

thinking about what we now consider to be psychological trauma, I will cite one of the case summaries and consider it in the light of some of the other observations made in the report.

In the fifth chapter the report relates and comments on several cases of claimants who suffered so-called *functional impairments* due to railroad accidents. The report distinguishes these functional impairments from injuries for which there is immediate physical evidence and classifies the latter ones as organic. Functional impairments were at the center of the medical-legal controversy that surrounded railway accidents, because they were particularly prone to exaggeration. Since there was no clear physical evidence to prove the existence of such impairments the courts had to rely on the victim's own testimony and on the reports of medical expert witnesses. One of the cases presented in the report is the following one:

A remarkable case (Shepherd v. the London and North-Western Railway Company) formed the subject of a trial at Oxford on the 13th July, 1858. It appeared that the train in which the plaintiff was travelling ran off the line on the 22nd March of the same year, when he was thrown violently about the carriage, and other passengers were thrown atop of him. He did not complain of any special injury at the time, and was able to walk about the scene of the accident, and to examine the defective arrangement of the rails; and on arriving at his destination he wrote a letter to the Times upon the subject. The next day he went to his office by omnibus, when, finding himself unfit for business, he returned home immediately, took to his bed for some days, and was obliged to go into the country to recover his health. According to his own account, he received a blow on the side, which caused him to pass blood for two or three days ; also a blow on the head, which left no bruise, but only a puffiness. His chief complaint at the time of the trial was a feeling of nervous depression, and particularly that the countenances of his fellow-passengers, with terrified eyes, would come before him whenever he attempted to do any reading or writing. Previous to the accident he had been able to drink one or two bottles of wine at a sitting, but since that time a single glass was his limit. Mr. Fergusson and others thought that the plaintiff would eventually recover, but probably not for twelve months. Messrs. Lawrence and Skey, on the other hand, thought that he was enjoying fair average health, and that the symptoms described were exaggerated. The jury gave £700 damages. (The Lancet, 1862, pp.116-117).

If we look at Mr. Shepherd's case from a contemporary perspective, we may be inclined to suspect at least a mild case of PTSD. This preliminary diagnosis is supported by: 1) intrusive memories of the terrified faces of fellow passengers (an example of diagnostic criterion B for PTSD in the DSM-5—*intrusions*); 2) the avoidance of the effects of consuming too much alcohol (an example of criterion C—*avoidance*); and 3) the feeling of

nervous depression (an example of diagnostic criterion D—*negative alterations in cognitions and mood*; and perhaps of criterion E—*arousal*—depending on the exact meaning attributed to “nervous”). Back in 1858 (the time of the trial) and 1862 (the time of the publication), no such diagnosis existed and, as we can see, medical opinions varied from being puzzled as to what caused such symptoms (“a remarkable case”), to thinking that nothing was really wrong with the victim (“fair average health”; “exaggerated”). The compensation that was awarded – £700 – was relatively low compared to compensations awarded for injuries with clear physical evidence.

The Lancet report classifies symptoms such as those reported in this case as *secondary effects*, thereby distinguishing them from obvious physical injuries (injuries that are corroborated by clear physical evidence)—these are classified as *primary effects*. The effects were also classified as secondary because they often had a delayed onset; they were not immediately evident and only emerged sometime after the accident.

Reading the Lancet report in full, what stands out to the modern mind (and might strike the modern reader as quite odd!), is the strong preoccupation of nineteenth century medical professionals with the adverse effects of the *rapid mechanical vibrations* generated in travelling trains. The medical professionals were of the opinion that railway travel *in general* was bad for human health, not just railway accidents. The main reason for this opinion were the rapid mechanical vibrations. To illustrate this view, here is an excerpt from the report:

Those effects on health which are clearly traceable to the influence of railway travelling differ both in degree and in character although there are certain symptoms which are nearly always present, yet no two cases are precisely similar throughout. Now, setting aside for the present all persons suffering from local disease, we are enabled to recognize a certain class of symptoms which, from the manner and history of their occurrence, we are justified in considering as attributable to the influence of travelling on railways as distinct from what other modes of conveyance produce, and from the known effects of any casual complications, such as anxiety, dyspepsia, chilled extremities, retention, retinal impressions, and the like. The symptoms are manifested through the nervous system chiefly, or through those physical conditions which depend on the perfect physiological balance of the nerve-forces for their exact fulfilment. They vary (in persons of very similar constitution) from simple irritability, restlessness, and malaise after long journeys up to a condition of gradually supervening paralysis, which tells of insidious disease of the brain or spinal cord, such

as, in its most pronounced form, follows on violent shocks or injuries to the nervous centers. These latter are the symptoms which frequently ensue from the vehement jolts and buffetings endured during a railway collision. And to the same cause, diminished only in intensity, may be also referred the less formidable group of symptoms. It is to this which the evidence and cases adduced in these reports point as the chief source of mischief, and that most detrimental to travellers. For each of those short, sharp vibrations felt in a railway carriage (and of which the number in every hour amounts to upwards of 20,000) resembles, on a small scale, the jerk and violent motion produced by a collision, from which it differs only in degree. (The Lancet, 1862, pp. 135-136)

Long-term exposure to the vibrations generated by the travelling train was considered particularly detrimental to health, and the report expresses concern for railroad personnel and postal workers, all of whom spent many hours per day on the railroad. The constant mechanical vibrations were believed to cause small concussions in the nervous system as well as small lesions in other organs (The Lancet, 1862; Schivelbusch, 2014; Harrington, 2001). Schivelbusch points at the similarities between the idea of such invisible injuries caused by constant mechanical vibrations and the concept of “metal fatigue” (structural damage to metal due to small fissures caused by continuous stress), which arose around the same time (Schivelbusch, 2014, pp.124-128.).

Secondary effects (functional impairments) resulting from railway *accidents* were interpreted along the same line as those caused by continuous exposure to rapid mechanical vibrations: they were thought to be symptoms of concussions and small lesions in the nervous system and in other organs. Because of the particular violence of the shocks and vibrations suffered during the accident, the secondary effects of accidents were thought to be more intense than the general negative effects of frequent railway travel.

Thus ultimately, in the beginning of the 1860s the medical experts in Britain explained the secondary effects of railway accidents as *invisible injuries to the nervous system and other organs*. They made no differentiation between organically-based and psychological symptoms. Psychological symptoms were simply considered to be part of the overall symptoms of (invisible) organic injuries.

Spinal concussion and its secondary effects

The London-based surgeon John Eric Erichsen had ample professional experience with victims of railway accidents and was familiar with the injuries such accidents could cause as well as with the wide variety of symptoms victims could display. He frequently

appeared in court as an expert witness on behalf of patients. In his two publications considered here (Erichsen, 1866, 1882), Erichsen makes a clear distinction between what he believed to be the organic effects and the psychological effects of accidents (accidents in general as well as railway accidents in particular). The fourteen lectures by Erichsen published in 1875 (and republished in 1882) are an expansion on six lectures published in 1866—those six lectures are included in the fourteen lectures—and it is particularly interesting to see how his opinion about the psychological effects of railway accidents had subtly changed between 1866 and 1875.

In the six lectures published in 1866, Erichsen sets forth an expanded theory of spinal concussion and he illustrates his theory with 14 case histories. He builds this expanded theory on the already existing construct of spinal concussion. In 1837, Sir Benjamin C. Brodie, a surgeon under whom Erichsen had trained (Harrington, 2001, p. 42, footnote 55), had published an article in which he described in detail his medical observations of the pathological condition known as “softening of the spinal cord” (*myelomalacia*). Brodie attributed this condition to spinal concussion injuries caused by severe blows to the spine (Brodie, 1837). In his lectures from 1866, Erichsen expands upon this theory. First he describes traditional cases of spinal concussion injuries resulting from direct, severe blows to the spine—these descriptions are predominantly based on his own observations and are similar to those described by Brodie. But then Erichsen proposes a *second* category of spinal concussion injuries—those caused by *less severe* and *indirect* blows to the spine, and it is in particular this category which is of interest here.

One of the goals of Erichsen’s publication was to show that certain functional impairments for which there was no clear physical evidence were nevertheless *organic* in nature and that these impairments involved small injuries to the spine and/or secondary inflammations of the spinal cord or the spinal membranes. This was the theory Erichsen had developed to explain the second category of spinal concussion injuries he proposed, those caused by less severe or indirect blows to the spine. Erichsen displays his medical expertise to convince fellow professionals that certain symptomatology are indeed based on *real organic injuries* and are not mere exaggerations by victims bent on extracting financial compensation from the railway companies. If one compares Erichsen’s line of reasoning with the views put forth in the *Lancet* report, the similarities between the two suggest that they both betray a common view among medical professionals. However, compared to the *Lancet* report Erichsen puts less emphasis on the special nature of injuries caused by railway accidents. He points out that the symptomatology he describes in relation to less severe or

indirect blows to the spine—a symptomatology often referred to as “railway spine”, a term which was fairly common at the time—does not just occur in victims of railway accidents, but frequently occurs in patients who have suffered secondary spinal injuries in any other way—for instance through falls, riding accidents, slipping down the stairs, twisting the spine, etc. He claims that such injuries occur more often as a result of railway accidents because of the frequency of such accidents and because of the more violent shocks and jolts to which victims are subjected during such accidents.

Most of the cases Erichsen describes in this second category of spinal injuries are reminiscent of what are now known as *Whiplash Associated Disorders*. Only one of the cases Erichsen describes in the six lectures published in 1866 contains elements of what we would call psychological trauma³⁷; however, he mentions the psychological symptoms only briefly and focusses primarily on the functional impairments directly related to the spine.

In the expanded version of his book—first published in 1875 and subsequently republished as a “new and revised edition” in 1882—Erichsen includes a lecture in which he specifically addresses psychological symptoms, including hysteria. In the 1866 edition he separated the symptoms of hysteria from those of spinal concussion in a rather blunt way. In this new edition he discusses mental shock and the symptoms traditionally related to hysteria more carefully and acknowledges their frequent occurrence in railway accidents. It is quite likely that he developed this lecture because other surgeons had started to point out that in some respect the impairments resulting from railway accidents *were* different from those caused by common falls and accidents and had pointed to the suffering of mental and emotional shock as one of the possible reasons for this difference.

To give an idea of the reasoning of fellow surgeons, here are two excerpts from lectures and notes by British surgeons published *between* the two versions of Erichsen’s book (they are also mentioned in Harrington, 2001). The first excerpt comes from a lecture by another prominent surgeon: Frederic Le Gros Clark. Like Erichsen, Le Gros Clark had personal experience with victims of railway accidents and had been an expert witness in court³⁸. The lecture from which the following excerpt is taken was first published in the *British Medical Journal* in October 1868:

³⁷ Case 13 (Erichsen, 1866, pp. 81-86).

³⁸ Unlike Erichsen however, Le Gros Clark had testified on behalf of railway companies.

It will be perceived that many of the foregoing symptoms and signs may be referred to what we are accustomed to regard as concussion of the spine, but many also are due to general rather than special nervous shock. (...)

I have already shown, in a preceding lecture, how powerful an influence emotional shock or physical concussion may exercise on organic vitality; and I think it not inconsistent with acknowledged facts, to affirm that protracted functional disturbance, or even fatal disease, may be the consequence of a rude shock, simultaneously, to the nerve-centres of the emotions, of organic and of animal life. I am, therefore, disposed to regard these cases of so-called railway spinal concussion as, generally, instances of universal nervous shock, rather than of special injury to the spinal cord. (Le Gros Clarke, 1870, pp. 151-152).

The second excerpt comes from a collection of notes and lectures by Professor John Furneaux Jordan and was first published in 1873:

The shock which follows injures in railway accidents presents, both as regards its cause and its results, so many peculiarities, that it is well to consider them separately though briefly. The principle feature in railway injuries is the combination of the psychical and corporeal elements in the causation of shock, in such a manner that the former or psychical element is always present in its most intense and violent form. The incidents of a railway accident contribute to form a combination of the most terrible circumstances which it is possible for the mind to conceive. The vastness of the destructive forces, the magnitude of the results, the imminent danger to the lives of numbers of human beings, and the hopelessness of escape from the danger, give rise to emotions which in themselves are quite sufficient to produce shock, or even death itself. Syncope, or concussion of the brain, may destroy consciousness for a time, or possibly altogether but, if consciousness return, depressing influences still operate, although less injuriously, but on a blunted nerve-power. All that the most powerful impression on the nervous system can effect, is effected in a railway accident, and this quite irrespectively of the extent or importance of the bodily injury. Indeed, if there be no bodily injury whatever, the shock may nevertheless be intense, and be followed by ulterior results, the nature and mode of termination of which it may be difficult to foresee. (Furneaux Jordan, 1880, pp. 37-38).

Both surgeons highlight the emotional or psychological shock suffered during a railway accident, and the effect suffering such a shock can have on the nervous system and the “organic vitality” of the victims, even if they suffer no physical injury.

Upon analyzing the further context from which these excerpts are taken it becomes clear that the surgeons in question were struggling to explain the wide variety of symptoms displayed by victims of railway accidents. Like Erichsen they were trying to understand the *mechanisms* behind these symptoms and to explain them in terms of organic changes, even when there was no direct physical evidence of such changes and even when they were willing to include emotional or psychological shock as an antecedent of the symptoms. Like Erichsen, both Le Gros Clark and Furneaux Jordan had a theory (either explicit or implicit) for how the symptoms they encountered might be explained organically.

At this point I want to emphasize that Erichsen’s theory of spinal concussion and secondary inflammation of the spinal cord *was* first and foremost a *theory*. There was no physical evidence for it. There was plenty of physical evidence for the original model of spinal concussion, but none for Erichsen’s expanded version. The most important evidence for the original model was the pathological evidence that came from post mortem examinations of deceased victims of spinal concussion injuries. It features prominently in Brodie’s account (Brodie, 1837). Erichsen likewise presents post mortem evidence for the *original* form of spinal concussion, but none for the second category he proposed. Nevertheless, for his theory to work, at least in *theory*, there *had* to have been some sort of physical blow to the body that directly or indirectly affected the spine and that could—at least in theory—result in the inflammations he proposed. Seeing no way to include emotional shock as a causal factor into the etiology of the spinal concussion, even of the second category, Erichsen had been careful to exclude it from his descriptions in the first version of his book. Furthermore, in the final lecture of the first book he gave an explanation of how spinal concussion could be distinguished from hysteria. Erichsen starts this explanation as follows: “*Hysteria* is the disease for which I have more frequently seen Concussion of the Spine, followed by Meningo-Myelitis, mistaken, and it certainly has always appeared extraordinary to me that so great an error of diagnosis could so easily be made” (Erichsen, 1866, p.126). He then goes on to point out why he wouldn’t mistake hysteria for spinal concussion: it is, he explains, because hysteria is a *women’s* disease, whereas spinal concussion affects both men and women equally. Apart from the fact that hysteria *was*

originally believed to be unique to women³⁹—a belief that was still shared by many medical professionals at the time of Erichsen, although others had started to question it—the fact that Erichsen concedes that the symptoms of spinal concussion are most often mistaken for those of hysteria signifies that without the belief that hysteria is unique to women both afflictions must have been difficult to distinguish.

Contrary to Erichsen, Le Gros Clark and Furneaux Jordan *had* theories about how emotional shock could lead to organic changes and lead to symptoms as those encountered in inflammations of the spinal cord or membranes, or of the brain itself. Le Gros Clark believed that in its effects emotional shock was similar to physiological shock (caused by serious loss of blood), particularly through its effects on the heart. He believed that emotional shock could easily affect the brain – due to a direct connection between the brain and the heart – and that it could weaken the vital forces in the organs and thereby promote inflammation (Le Gros Clark, 1870, pp. 65-81). By such mechanisms emotional shock could directly or indirectly cause organic changes such as syncope and inflammations. Furneaux Jordan believed that emotional shock could poison the blood and thereby spread inflammation to other parts of the body (Furneaux Jordan, 1880, pp. 39-41). He doesn't provide a theory for how this would work however.

In the lectures he published in 1875, Erichsen mentions none of these theories. He holds on to his original spinal concussion model and it remains virtually unchanged from 1866. In order to preserve his model, he had to maintain that emotional factors can play no causative part in it. He has, however, changed his mind about the role hysteria can play in the aftermath of railway accidents, and he is far more favorable to the likelihood of its frequent occurrence in men as well as women. He also counsels that its symptoms should be taken seriously and not be dismissed as malingering or exaggeration. Still, Erichsen's main concern is his expanded model of spinal concussion, not the *psychological* effects of railway accidents, and, although he is more favorable to the (real) impairments caused by emotional shock, he offers no theoretical explanation for how emotional shock could lead to functional impairments.

In all editions of his book Erichsen includes a comprehensive description of the typical development of the impairments associated with the second category of spinal

³⁹ The term hysteria derives from the Greek word for womb (*hystera*), and the womb had since antiquity been implicated in afflictions believed to be unique to women. Mark Micale ends a brief historical overview of hysteria with the words “Males, according to these age-old theories, were definitionally excluded from the disease” (Micale, 2008, p. 10).

injuries—the category he proposed. Curiously, in the book published in 1875 (and as a new edition in 1882) this description is identical to the one he gave in 1866, *but for the addition of six words to the final sentence*. These added words somewhat compromise his efforts to keep psychological disorders separate from those of spinal concussion. The sentence is as follows:

His symptoms become progressively more and more confirmed, and at last he resigns himself to the conviction that he has sustained a more serious bodily injury than he had at first believed, and one that has, in some way or other, broken down his nervous power, and has wrought the change of converting a man of mental energy and of active business habits into a valetudinarian, a hypochondriac or a hysterical paralytic, utterly unable to attend to the ordinary duties of life. (Erichsen, 1866, p. 97; 1882, p. 145)

The words “a hypochondriac or a hysterical paralytic” were added in the 1875 edition. The addition of “hypochondriac” and “hysterical paralytic” slightly undermines the message of the rest of the book, it suddenly adds the idea of a morbid focus on possible symptoms of disease (hypochondria) to the image and implies that paralysis can be (or even *is*) caused by *hysteria* and not (just) by inflammation of the spinal cord or membranes.

So far we have seen that the first investigations that tried to make sense of the medical implications of railway accidents focused on physical injuries and made no distinction between the organic and the psychological effects of these accidents, they were both attributed to the powerful jolts, blows and vibrations suffered during the accident. This was in agreement with the general line of reasoning that the rapid mechanical vibrations endured during railway journeys were detrimental to human health and caused concussions and lesions in the nervous system as well as in other organs and that the jolts and shocks suffered during an accident were stronger than, but not significantly different from the general vibrations.

Erichsen focused on one specific type of physical injury: secondary inflammations of the spinal cord and its membranes. He was set on the theory that railway accidents (as well as other accidents involving mechanical/physical blows) could cause a second category of spinal concussion, which subsequently could lead to inflammation of the spinal cord or the spinal membranes. For his theory to be consistent he needed to separate the organic effects of railway accidents from their psychological effects. Initially he classified the psychological effects as hysteria, not to be taken too seriously. Later, while still strictly separating the psychological effects from the organic effects implied in his theory, he attributed more

weight to the psychological effects of railway accidents, but didn't offer a theoretical explanation for such effects.

Fright neurosis and traumatic hysteria

In 1881, Herbert William Page, another British surgeon involved in litigation related to railroad accidents, defended his dissertation on *Injuries of the Spine and Spinal Cord Without Apparent Mechanical Lesion, and Nervous Shock, in their Surgical and Medico-Legal Aspects*. In this dissertation he was fiercely critical of Erichsen's theory. The dissertation earned him the prestigious *Boylston Medical Prize* from Harvard University. Two years later he published a greatly extended version of his dissertation in book-form (under the same title) and after another two years the book received a second edition (Page, 1885). In his book Page asserted that in many cases the symptoms associated with "railway spine" were the result of a combination of *nervous shock* suffered during the railway accident and the pain caused by (often minor) injuries to the ligaments and the muscular structures of the spine. He rejected Erichsen's theory of secondary inflammations of the spinal cord or its membranes and emphasized that there was no pathological evidence to support it. According to Page, the symptoms that Erichsen attributed to secondary inflammations of spinal cord or membranes could be better explained by a hysterical reaction resulting from the nervous shock suffered during the accident.

Page went on to develop his own trauma model. His efforts to develop this model did not occur in isolation however, they greatly coincided with those of Jean-Martin Charcot in Paris, Hermann Oppenheim in Berlin, and James Jackson Putnam in Boston. So much so that it seems almost justified to speak of a common effort to which all four contributed. Page, Charcot, Oppenheim and Putnam developed their theories practically simultaneously, they followed and studied each other's works and it is known that at least Charcot and Oppenheim corresponded with one another (Lerner, 2001, p. 144).⁴⁰

⁴⁰ Charcot (who was 20 years older than Page) only started dedicating himself to the study of trauma in the final 15-16 years of his life. By that time he had already build an extensive body of work in neurology – particularly in the area of cerebral localization. Charcot's trauma-related publications consist primarily of case studies and include approximately twenty cases with a main diagnosis related to traumatic neurosis or traumatic hysteria ("névrose traumatique," "hystérie traumatique," "hystéro-traumatisme," or "hystéro-neurasthénie traumatique." Micale, 2001, p. 116). These case studies with traumatic neurosis or hysteria as the main diagnosis were all written between 1878 and 1893. This coincides closely with Page's publications. Oppenheim was much younger. He was 13 years younger than Page and started studying neurosis in his late twenties, in 1884. At the same time he started corresponding with Charcot. For his thesis, which he defended two years later, Oppenheim studied the influence of shock on neurotic disorders. In 1889 he published a detailed study of traumatic neurosis based on five years of clinical observation (Oppenheim, 1889; Lerner, 2001).

Comparing the four models of traumatic neurosis/hysteria proposed by Page, Charcot, Oppenheim and Putnam, three of them include the following components (Ellenberger, 1970; Micale, 2001; Oppenheim, 1889; Page, 1885, 1892, 1897; Putnam, 1898):

1. A strong *emotional state* (Putnam expands this component to include *mental* and *somatic* states)—these states act as a trigger (“agent provocateur”);
2. A *neurological basis* with two subcomponents:
 - a. a (possibly neurodegenerative) *predisposition* (a trait);
 - b. a *disequilibrium* in the interaction of different neurological levels (a state) (and possibly a subsequent *adjustment* in the interaction)—here the models use Hughlings Jackson’s concepts of *dissolution* of higher levels and *disinhibition* of lower levels (for a synopsis of Hughlings Jackson’s concepts see Appendix 5);
3. An altered state of consciousness—an “hypnotic daze”
4. (Self)-suggestion;
5. Pathological *symptoms* (*behavioral/functional*—without decisive somatic evidence, for example resulting from post-mortem investigation).

Although Oppenheim refers to the hypnotic daze mentioned by others, the altered state of consciousness is not really part of his model. His model appears to be purely “physicalist”. His model therefore doesn’t need consciousness as an active component.

Summarizing the development of the theoretical models of posttraumatic disorder discussed so far we can see a shift from purely somatic explanations—such as those in the Lancet report and Erichsen’s spinal concussion/inflammation model, but also Oppenheim’s model—to models which include both somatic *and* psychological components. In the earlier publications and in Oppenheim’s model, the posttraumatic symptoms (including the psychological symptoms) were attributed exclusively to anatomical lesions or physiological disturbances and to secondary (physical) effects, such as inflammations and changes in the cerebrum. These models can therefore be considered mechanical and biological in nature. Apart from an (anatomical) neurological component, Page’s, Charcot’s and Putnam’s model also include prominent *psychological* components, such as emotional state, state of consciousness and an ideational component (suggestion). The purely mechanical models have only one level (unless anatomical and physiological components are separated into two different levels), the psychological-neurological models have an added psychological level. Functional impairments and behavioral symptoms as such are not part of the models, they are

the actually perceived phenomena and can be thought of as the observable “output” of the model.

Science, law and politics and the psychological factors of trauma

The inclusion of prominent psychological factors in the theories about posttraumatic disorders led to a dilemma which gained considerable weight as the nations in which the theories were being developed went to war in the early twentieth century. This dilemma was related to how psychological factors should be interpreted – what weight should be attributed to such factors. Should they be considered *as* real as physical injuries and lesions and inflammations of the spine? Or were they just exaggerations, attempts at receiving compensation from railway companies or the government while no real injuries were suffered?

Erichsen, Page, Oppenheim and Putnam had all been involved in compensation cases related to railway accidents, some of them working on behalf of the patients, others on behalf of the railway companies. But they all agreed that, in the majority of cases, the psychological symptoms resulting from accidents should be taken seriously and weren't merely simulating or malingering.

Erichsen's attempts at explaining the functional impairments of his patients as 'real' physical lesions or inflammations can be seen in the light of his efforts to have the symptoms taken as seriously as those resulting from cases of evident spinal concussion. In his first book he doesn't pay much attention to purely psychological symptoms, but in his second book he dedicates an entire chapter to hysteria. Although he still strictly separates it from the functional impairments resulting from spinal inflammations (his main theory), he insists that hysteria should be taken seriously and treated adequately.

But by no means all physicians and neurologists shared this opinion. At the turn of the century, particularly in France and Germany, many prominent professionals started to use the models that implied psychogenesis and ideation as evidence for malingering and simulation. In Germany for example, prominent neurologists started to use the term “pension hysteria” to indicate that the symptoms displayed by many trauma-victims (whether they should be considered 'real', or simulated) were primarily caused by the hope for financial compensation. In 1915, Oppenheim wrote the following about his colleagues:

The bitterest and most vigorous opposition came to the fore with the question of simulation and pension hysteria. Two currents distinguished themselves here. A great number of the examining doctors [Vertrauensärzte], who were not trained in neurology or psychiatry, saw simulation everywhere they looked when confronted

with symptoms that could not be explained by a lesion of the nerves, brain or spinal region. It was especially the psychic and psychogenic disorders which they were completely helpless against. And since it mostly involved patients who demanded that the doctors recognize their suffering, they had to impose the suspicion of simulation. (cited in Lerner, 2001, pp. 151-152).

During World War I, as their soldiers returned from the trenches, the nations involved in the war saw a rise in posttraumatic symptoms to epidemic proportions. With this enormous rise in the number of those affected, the dilemma faced earlier by the doctors working with the victims of railway accidents reached new levels. Earlier the railway companies hadn't encountered much sympathy from the courts, and even doctors working for the railway companies were of the opinion that posttraumatic hysteria or neurosis were a real disease and that some compensation should be awarded. Now however, the state *itself* was to foot the looming bill of compensation, and many doctors saw the economic burden this would put on the state as part of their responsibility. Moreover, it was no longer only the question of whether or not financial compensation (or war pensions) should be awarded to those affected by psychological trauma, there were important moral considerations too. During war, simulating and malingering were equated to cowardice—to desertion even—which put those suspected of simulation in a completely different light than those who were suspected of trying, perhaps unrightfully, to gain financial compensation after having been involved in a railway accident.

Thus the economic and moral welfare of not only the individual, but of entire nations came to play a role in how psychological trauma was considered, and this was also reflected in scientific thinking about trauma. In the countries at war it was the duty of the physicians to diagnose the traumatized soldiers, and the same etiological considerations that had earlier occupied the surgeons involved in railway accidents resurfaced.

The concept of cerebral or spinal concussion caused by strong vibrations resurfaced in the construct of *shell shock*—this time the damaging vibrations were thought to be generated by exploding artillery shells. But soon it was realized that many men displaying symptoms of shell shock had never been near exploding shells or had even never been near the frontline. This in effect ruled out cerebral or spinal concussion. Nevertheless the term “shell shock” remained and was soon used for psychological trauma, especially in Britain.

Thus the questions that had first captured the nineteenth century railway surgeons and neurologists took front stage once again: what *were* posttraumatic disorders—were they

caused by anatomical lesions or concussions; were they simply simulation and malingering; or were they genuine psychological disorders?

While in Britain the war poets—Siegfried Sassoon and Wilfred Owen in particular⁴¹—moved national consciousness towards the hesitant acceptance of the reality of psychological trauma, in Germany Oppenheim’s opponents gradually gained the upper hand, in both the political and the scientific debate about traumatic neurosis. Not the genuine psychological/neurological reaction to horrific circumstances, but “wish complexes” and a “will to sickness” came to dominate the view on the cause of posttraumatic disorders in Germany, and in 1926 pensions for mental trauma were officially abolished (Lerner, 2001; van der Kolk, Weisaeth, et al., 2007). In France Charcot’s insights had all but been forgotten and “war hysteria” was trivialized as “mythomania”. The official stance was that it was only a “marginal phenomenon” (Roudebush, 2001, p. 253).

Pierre Janet’s model of psychological functioning

Pierre Janet (1859-1947) started working on his theories about human psychological functioning around 1885 when he decided to study hypnosis, suggestion and hysteria as the subject of his doctoral thesis in philosophy (Ellenberger, 1970). He continued to develop and refine his theories for more than 50 years. Although not explicitly a trauma model, his composite theory of psychological functioning contains an implicit explanation of what we now refer to as psychological trauma. Although there are similarities with the trauma models developed by Page, Charcot, Oppenheim and Putnam, Janet’s theoretical model is much more comprehensive than their models and offers a much deeper view into human psychological functioning.

I have written an extensive summary of the core of Janet’s theories, which is attached to this thesis in the form of an appendix (Appendix 6). I have attempted to summarize the

⁴¹ The poem “Survivors” by Siegfried Sassoon is a good example. Sassoon used irony to question the common view that psychological trauma was merely a fleeting affliction not to be taken too seriously. The poem was written in 1917 while Sassoon and Owen were receiving therapy in Craiglockhart War Hospital in Edinburgh:

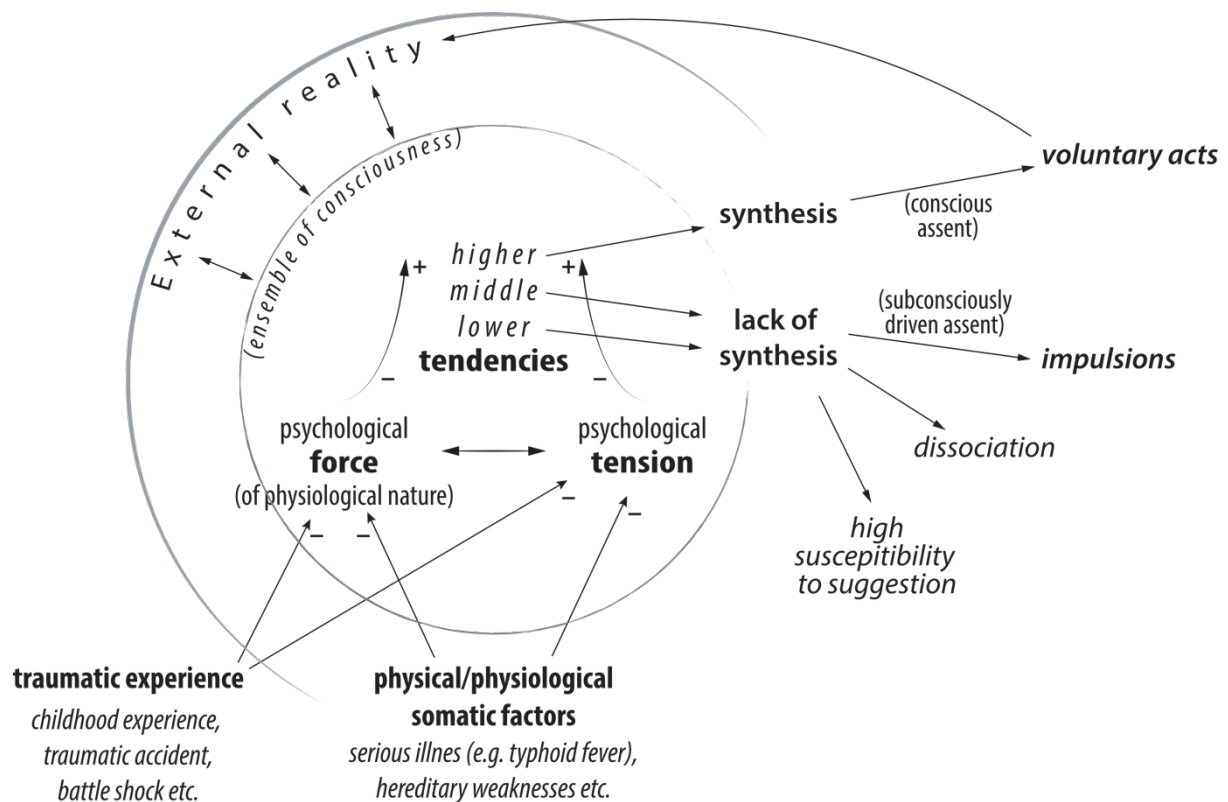
NO doubt they’ll soon get well; the shock and strain
Have caused their stammering, disconnected talk.
Of course they’re ‘longing to go out again,’—
These boys with old, scared faces, learning to walk
They’ll soon forget their haunted nights; their cowed
Subjection to the ghosts of friends who died,—
Their dreams that drip with murder; and they’ll be proud
Of glorious war that shatter’d all their pride...
Men who went out to battle, grim and glad;
Children, with eyes that hate you, broken and mad.

Sassoon, S. (1917). Survivors. <https://englishverse.com/poems/survivors>

main parts of Janet’s theories in a composite schematic representation (Figure 8). Central are the concepts of *fonction du réel* (the “function of reality”), *psychological force*, *psychological tension* and the developmental/evolutionary hierarchy of *psychological tendencies*. The “function of reality” is the ability of the personality to be in touch with the demands of reality. Janet: “The most difficult mental operation, since it is the one which disappears first and most frequently, is the *fonction du réel*.” (Janet, cited in Ellenberger, 1994, p. 376). The function of reality results in *présentification*: the mental synthesis (or presentation—see Study 1) of the present moment. Presentification is a synthetic operation that consists of *attention* (the ability to perceive the outside reality as well as one’s own internal reality), and the *ability to act appropriately* upon the external reality. “The real present for us is an act of a certain complexity, which we grasp as one single state of consciousness in spite of this complexity, (...) Presentification consists of making present a state of mind and a group of phenomena” (Janet, cited in Ellenberger, 1994, p. 376).

Figure 8

A psychological model based on Janet’s theories



Note. A schematic representation of the psychological model based on Janet’s main theories.
Copyright 2019 by P. A. J. M. de Wit.

A psychological tendency can best be understood as the organism's disposition to execute a determined (psychological) action. Janet developed a hierarchical model of 9 tendencies that correspond to increasingly higher developed levels of mental synthesis. The available psychological force (or energy) and tension (the capacity to use the available psychological force to attain higher tendencies) determine the highest level of psychological tendencies on which synthesis can be accomplished. If either psychological force or tension are temporarily insufficient—for example due to an illness, or to a traumatic experience—this can lead to a momentary loss of the function of reality, to a momentary inability to engage the higher psychological tendencies, and thereby to a lack of synthesis on these higher levels. To maintain dynamic synthesis—at least at a lower hierarchical level—threatening ideas, memories, intentions etc. can be(come) dissociated. Loss of psychological force and/or tension also interferes with the ability to consciously assent to ideas of an act (see Appendix 6). When this situation is prolonged, dissociated ideas, memories, intentions etc. can lead to subconsciously driven behavior. Furthermore the susceptibility to suggestion greatly increases when the higher tendencies can no longer be reliably engaged.

In this model, based on Janet's psychological theories, what we now designate as *trauma* essentially results from the lowering of psychological force and/or tension, caused by a traumatic experience. The consequences of this lowering depend on an individual's general level of psychological tendencies, on the magnitude of the lowering and on its duration. Janet believed that dissociated psychological *content* (fixed ideas etc.) is “both the result of mental weakness and a source of further and worse mental weakness” (Ellenberger, 1970, p. 366). If the content isn't assimilated back into personal consciousness, it can further undermine the psychological force and the psychological tension available to personal consciousness, and thereby lead to a more chronic lowering of the ability to engage in higher psychological tendencies and to engage properly with reality. This can lead to a vicious cycle in which voluntary acts become rarer and impulsions and psychological automatisms become more dominant. In short, behavior gradually degrades to behavior nowadays associated with traumatic disorders.

Freud's purely psychological explanation of trauma

To round off this section I would like to briefly discuss Sigmund Freud's “Memorandum on the Electrical Treatment of War Neurotics” (Freud, 1955, pp. 211-215), written in the wake of the first World War and published in 1920. Although it offers a new explanation of traumatic neurosis, this explanation is based on not much more than Freud's opinion inspired by his psychoanalytical theory. The “facts” he presents as justification for

his opinion—i.e. that by the end of the war traumatic neurosis had disappeared⁴²—are not borne out by historical evidence.

Freud starts the memorandum with a brief summary of the developments which have been described in the present section of this study. Following this, the memorandum shows that—from the perspective of his psychoanalytic theory—Freud viewed “trauma” as something *purely psychological*, based on a conflict of motives that remains unconscious. The patient “solves” this conflict by “escaping” into neurotic symptoms—a “solution” which can be traced back to disturbances in the patient’s emotional life in early childhood. Freud depicts traumatized soldiers as unconscious malingerers, whose “solution” to their unconscious conflict can be turned around by introducing a *new*, more urgent motive: to escape from the pain of electro-shock treatment. By choosing for this escape, the patient returns to psychological “normality”. Implicit in the memorandum is Freud’s opinion that the end (returning to normality) justifies the means (subjecting the patient to the pain of electro-shock treatment, which, according to Freud, was considerable—a fact that, he claims, was not acknowledged by those who promoted the treatment). In my view Freud’s stance doesn’t offer a valuable contribution to the development of the understanding of trauma. It is best seen in the context of the greater middle European⁴³ mindset after the first world war, which suggested that posttraumatic disorders could be reduced to “wish complexes” and a “will to sickness”.

Nevertheless, Freud’s theory brings to light an interesting aspect encountered in many attempts to understand trauma. While proposing that traumatic neurosis is purely psychological, Freud portrays it as based on a deliberate (albeit unconscious) *decision*—in other words, his theory suggests that there is an intentional element at work in the genesis of traumatic reactions. The goal of psychoanalysis would be to uncover this decision—to bring it to consciousness. However, in the memorandum Freud suggests that presenting a more urgent problem (finding a way to escape from pain) can *undo* the decision altogether—the new intention (escaping from pain) *replaces* the intention that led to the neurotic reaction.

This observation leads me to the following one. In the development of trauma-models as discussed here, and when comparing different models with each other, two polarities become visible (see Figure 9). In fact, these polarities can be traced throughout trauma-

⁴² “But with the end of the war the war neurotics, too, disappeared—a final but impressive proof of the psychical causation of their illnesses” (Freud, 1955, p. 215).

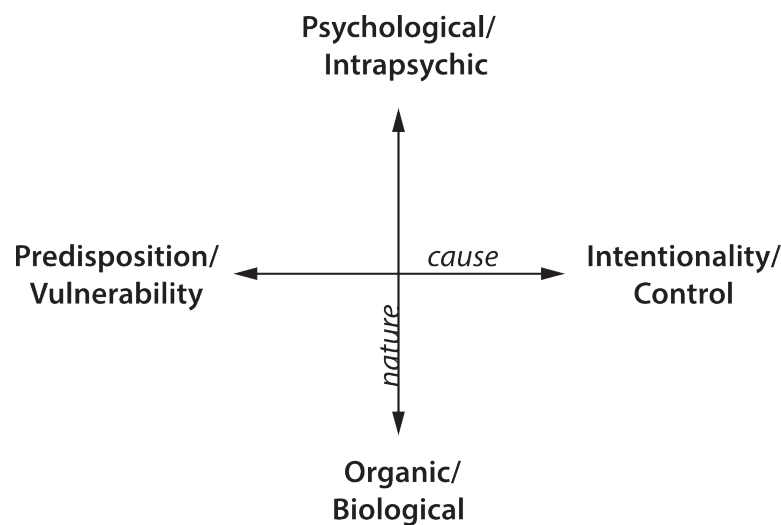
⁴³ With middle European I here mean the main German-speaking parts of middle Europe: Germany and Austria.

related theories from the mid-nineteenth to the late twentieth century (see also van der Kolk, Weisaeth, et al., 2007). These polarities are:

- 1) a polarity concerning the **nature** of trauma: theories consider the nature of trauma to be either *psychological/intrapsychic* or *organic/biological* (the vertical polarity in Figure 9);
- 2) the polarity concerning the **cause** of traumatization (within the person, disregarding the traumatizing event): many theories seek to locate the cause of traumatization in a preceding *disposition/vulnerability*, while others also take (conscious or unconscious) *intentionality/control* into account (the horizontal polarity in Figure 9)

Figure 9

Two polarities in trauma-related theories and models



Note: When comparing the trauma theories developed in the nineteenth and the twentieth century, they can be positioned on the two polarities that concern the cause and the nature of trauma.

The earliest theories about the railway spine saw human beings more or less equally vulnerable to the mechanical stress of railway travel and considered the nature of the symptoms completely biological. With the introduction of psychological elements the polarity between predisposition and intentionality came more to the foreground. In Freud's purely psychological "model" the polarity between predisposition (in Freud's view: the particular manner in which the patient dealt with emotional disturbances in early childhood) and intentionality (unconscious motives) loses its polar nature, because unconscious malingerers cannot be held responsible for their "solution". In the case of war neurosis they must be "shocked" out of it, in the case of psychoanalytic patients their unconscious motives, as well as the emotional disturbances from early childhood must be brought to consciousness

in the lengthy interaction with the therapist, and as the patient catches up on his emotional development he is expected to make his decisions consciously. The other models discussed in this part can be positioned onto the four quadrants that are formed by the two perpendicular lines depicting the polarities. Janet's psychodynamic model spreads most evenly over the quadrants.

Developments from the aftermath of WWI to the second half of the 20th century

In this intermediate part between the early trauma models presented above and the contemporary trauma models presented afterwards, I want to present some of the main developments in the understanding of stress and emotion—particularly the emotion of fear—and the way in which physiological processes on the one hand and cognitive appraisal on the other are involved in the outcome as well as in the experience of stress and emotion. This development is particularly interesting, because it resonates strongly with a cognitive model that was presented and discussed in Study 1. I am referring to the model of “bottom-up”/“top-down” processing, that in cognitive psychology is used to explain *perception*.

Physiological processes and tonic immobility

Walter Bradford Cannon. In 1915 the physiologist Walter Bradford Cannon (1871-1945) was the first to describe the physiological reactions involved in what has come to be known as the *flight and fight response* (Cannon, 1915). Later, in 1942, Cannon published an article in which he tried to explain the phenomenon of *Voodoo death* (Cannon, 1957). This sudden form of death, apparently induced by the strong emotional response of fear to a suggested or “magical” outside force, had until then been unexplained and had not been taken very seriously by scientists.

In his article Cannon proceeded to explain this form of death by describing the physiological reactions he believed were the underlying cause of death. His physiological explanation—based on activation of what he calls the sympathico-adrenal division of the nervous system—was not only able to explain the phenomenon of voodoo death, but could also be used to explain other instances of sudden death related to strong emotional responses. Using examples from his work with injured soldiers during the first world war and several examples of others, Cannon explained that when this state of sympathico-adrenal activation is maintained for a longer time *without leading to action*, the adrenaline-induced contraction of the blood vessels gradually leads to a state in which the blood pressure falls and a number of peripheral organs are less efficiently supplied with blood. The capillaries in those organs then become permeable to blood plasma which eventually leads to a loss in blood volume and results in a state that is comparable to *physiological shock* with related symptoms of a very

rapid pulse and respiration, and a clammy, cold and pale skin. This state of shock then leads to deterioration of the vital organs and finally to death.

Vagus death. In 1957, a group of researchers lead by Curt Richter made a curious discovery, which suggested that Cannon's explanation of sudden death as an over-activation of the sympathetic nervous system had not been correct (Richter, 1957). The group investigated the resilience of different groups of rats to drowning. The rats were put into a glass jar of water and were prevented from floating (by a jet of water that caused sufficient turbulence). One group of rats would swim for more than 60 hours before drowning due to exhaustion. However, rats that had been restrained prior to being placed into the water, and had suffered a reaction of tonic immobility would drown within minutes. Some wild rats even died *during* the restraint, before being put into the water. During these experiments immobility was actually an unintended secondary effect. The cause for the rats' immobility was that they had to be restrained in order to shave off their *whiskers* (called vibrissae in rodents) prior to being placed into the water vats. These experiments were carried out with domesticated as well as with wild Norwegian rats. Of the domesticated rats only a few went into a state of tonic immobility due to the restraint, but unlike the domesticated rats the wild rats were so fierce that they had to be picked up and restrained by using a black bag, to be able to shave off their vibrissae or to be dropped into the jars. All of these rats went into tonic immobility while being restrained and—as mentioned above—some of them died while being restrained.

The researchers became very curious as to the cause of death of those rats and decided to perform repeat experiments in which they monitored the heart rates prior to death and performed autopsies on the rats after they had died. They discovered that the heart-rates of those rats would *slow down* prior to drowning, while at the moment of death the hearts were *engorged* with blood, meaning that they had stopped beating during *diastole* (relaxation of the heart muscle).

In the article in which he published the results of the experiments, Richter challenged Cannon's findings. Richter suggested a different explanation for sudden death induced by threat. If over-activation of the *sympathetic nervous system* would have caused the sudden death of the rats in the experiments—so he argued—their heart rates would have been high and they would have died with the heart in a state of *systole* (contraction). However, since the rats died after their heart rates decreased and while their hearts were in diastole, Richter concluded that the rats did not die from overstimulation by the sympathetic nervous system but from over-activation of the *parasympathetic* nervous system. In his article Richter called

this type of death a *vagus death*—since it is the unmyelinated part of the vagus nerve that is thought to be responsible for these physiological reactions.

What is even more remarkable than the findings reported by Richter, is the way in which he explains the sudden deaths. He doesn't stop at the physiological explanation, but includes an emotional element and hints at some form of intentionality:

The situation of these rats scarcely seems one demanding fight or flight—it is rather one of hopelessness; whether they are restrained in the hand or confined in the swimming jar, the rats are in a situation against which they have no defense. This reaction of hopelessness is shown by some wild rats very soon after being grasped in the hand and prevented from moving; they seem literally to "give up."

...

A phenomenon of sudden death has been described that occurs in man, rats, and many other animals apparently as a result of hopelessness; this seems to involve overactivity primarily of the parasympathetic system. (Richter, 1957, pp. 196-197)⁴⁴

No doubt Richter felt he needed to include an emotional element in his explanation, because Cannon had centered his explanation of Voodoo death around the emotion of fear.

Stress

In their attempts to explain sudden death by pointing at the effect on the organism of the underlying *physiological processes* first Cannon and later Richter set an example for other scientists to follow. Over the past decades scientific research of defensive behaviors and trauma-related phenomena has focused more and more on the *physiological processes* involved. The insights into these processes have become very sophisticated and very compelling. Presently many researchers have come to a stage where the focus on these processes has become so intense that they often appear to suggest that the physiological processes themselves are the causative factors of behavior, emotions and trauma-related symptoms.

In this and the following section, I would like to turn to two areas of research in which researchers investigated the interaction between physical and psychological wellbeing and states of arousal related to activation of the autonomous nervous system, and between *cognitive appraisal* and states of arousal related to activation of the autonomous nervous system. Although these areas of research do not directly involve trauma or trauma models,

⁴⁴ See also Seligman, M. E. P. (1975). *Helplessness: On Depression, Development and Death*. W. H. Freeman. Seligman appears to have come to a similar sentiment as Richter (or to have fully adopted Richter's interpretation) and wrote a whole book about it.

the influence of cognitive appraisal and physiological activation on subjective experience and on action/behavior also concerns the experience of and the behavior related to traumatization.

The “discovery” of stress. Stress—not unlike *trauma*—turns out to be quite elusive to define and involves much more than a series of physiological reactions leading to certain physical and psychological states. Hans Selye (1907-1982), the Hungarian endocrinologist who spent most of his life researching stress and educating the public about it, was once told about a comment by a British physician who, based on Selye’s own citations, wrote “Stress, in addition to being itself, is also the cause of itself, and the result of itself” (Paul Rosch in his foreword to Humphrey, 2005). This circularity is in part due to semantics: what we generally call by the name of “stress” has at least three distinct aspects which we also tend to call just that: *stress*.

To create a little more clarity the following distinctions can be made. First of all, we perceive *sources* of stress. Selye helped distinguish this aspect of stress by coining the term “*stressor*” for it. Such stressors can be *external* or *internal*. Secondly, there is stress as an *inner subjective experience in itself*—our inner feeling-state when we are stressed or under stress. And thirdly there is the *stress-response of our body*: a series of specific physiological reactions that occur quite consistently regardless of the cause or source of stress.

Until the 1920s the term stress was mainly used in relation to *physical strain*—particularly in physics, where stress indicates the force exerted on material objects resulting in strain. Only in the 1920s did the word stress come into use as a term describing psychological or biological strain on human beings. Cannon used the term in 1926 referring to environmental factors that challenge homeostasis (Cannon, 1926). Hans Selye developed the concept of stress further and his discoveries and ideas, together with those developed by Richard Lazarus a few decades later, have had perhaps the greatest influence on our present-day concept of psychological and biological stress.

General Adaptation Syndrome. In a letter to the editor of *Nature* published in 1936, Selye reported on experiments he had performed on laboratory rats that led him to develop his theory on stress (Selye, 1936). He had injected rats with an ovarian extract which caused several profound physiological reactions. Being an endocrinologist he initially believed he had discovered a new hormone, but he soon found out that the *same* physiological reactions were caused by injections with *every* irritating substance he tried, as well as by a host of other harmful situations such as: exposure to cold, surgical injury, spinal shock and excessive muscular exercise. He gave the syndrome, which he inferred was behind the physiological reactions, the name *General Adaptation Syndrome* (GAS).

He divided the physiological reactions displayed by the rats into three distinct stages, which he referred to as the three stages of the general adaptation syndrome. He labeled the first stage, which in his experiments occurred 6 - 48 hours after the initial injury, "*general alarm reaction*". The physical symptoms of this stage included: rapid decrease in thymus, spleen, lymph glands and liver; edema formation; loss of muscular tone, fall of body temperature and loss of substance from the adrenal glands. During the *second* stage (starting after 48 hours when 'treatment' with the stressor *continued*) the adrenal glands became greatly enlarged while general body growth ceased (in immature rats) and milk secretion stopped (in lactating rats). However, with continuing treatment most of these symptoms *disappeared* during the second stage and the function of the organs returned more or less to normal. Selye called this stage the *resistance stage* because the animals were believed to build up *resistance* to the ongoing treatment and to start *adapting* to the new situation. The third stage, the stage of *exhaustion*, set in one to three months after the start of the treatment, depending on its severity. In this final stage the animals *lost* their resistance and succumbed to the stress-response. The symptoms displayed during the first stage returned and would eventually lead to the animal's death. Selye:

Since the syndrome as a whole seems to represent a generalized effort of the organism to adapt itself to new conditions, it might be termed the "general adaptation syndrome". (...) It seems to us that more or less pronounced forms of this three-stage reaction represent the usual response of the organism to stimuli such as temperature changes, drugs, muscular exercise, etc., to which habituation or inurement can occur. (Selye, 1936, p. 32)

Selye realized that his model applied equally to humans. In later years the third stage of Selye's general adaptation syndrome has often been used to explain the effects of *chronic stress*.

Eustress and distress. In 1975 Selye published an article in which he proceeds to differentiate two forms of the stress response, he labeled one *eustress* and the other *distress*. He considered eustress a positive stress response, in which a stressor appears to trigger and enhance physical and/or mental functioning, normally resulting in positive adaptation. Distress however, was seen as acute or persistent stress that was not resolved through coping or adaptation. Distress leads to anxiety or withdrawal, eventually resulting in depression and in severe cases in death. The most remarkable aspect of this distinction however, was Selye's conclusion that whether a stressor (either real or imagined, either external or internal and either negative or positive) resulted in eustress or in distress depended on *personal*

expectations as well as on available resources to cope with the experience. When the initial alarm-reaction mobilizes an individual's resources, a stressful experience may be met as a challenge and then, as eustress, eventually lead to adaptation; alternatively it may be considered unsurmountable, too difficult, or too much and lead to distress and its manifestations. Interestingly, both the physical stress-response and the general adaptation syndrome can be predicted very reliably and described very specifically in physiological terms. However, whether they will result in *eustress* or in *distress* is not determined by any objective, measurable property of the stressor or of the stressed individual; it is mainly determined by the individual weighing his subjective evaluation of the stressor against a subjective evaluation of his available resources. In Selye's words (published posthumously):

During both eustress and distress the body undergoes virtually the same nonspecific responses to the various positive or negative stimuli acting upon it. However, the fact that eustress causes much less damage than distress graphically demonstrates that it is "how you take it" that determines, ultimately, whether you can adapt successfully to change. (Selye, 2018)

Cognitive appraisal and coping

Cognitive appraisal and emotion. At the end of the nineteenth century William James had published an article in which he asserted that the subjective experience of an emotion follows its expression, and not vice versa (James, 1884). In 1885, independent of James, the Danish physician Carl G. Lange came to the same conclusion, additionally asserting that the main physiological cause for emotions are *vasomotor changes* (changes in the constriction/dilatation of the blood vessels, resulting in changes in blood pressure). Since then their combined view has come to be known as the *James-Lange theory of emotion*.

From as early as 1915, Walter Cannon published results of experiments he had conducted that challenged the James-Lange theory. Together with his doctoral student A. Philip Bard, Cannon developed an alternative to the James-Lange theory, which has come to be known as the *Cannon-Bard theory of emotion*. According to Cannon and Bard autonomic arousal (the bodily changes implied in the James-Lange theory) was a direct result of a thalamic discharge, traveling along *efferent* pathways to muscles and viscera, whereas the experience of emotion resulted from excitation by the thalamic discharge of *afferent* pathways to the cortex. Thus emotional expression and emotional experience were not dependent on one another but happened simultaneously as a result of the same thalamic discharge. According to Cannon and Bard's theory—and contrary to James and Lange's

theory—the experience of an emotion is not dependent on autonomic arousal (Cannon, 1927).

30-odd years later, the relatively new field of cognitive psychology added another perspective to existing theories of emotion. In 1962 two psychologists, Stanley Schachter and Jerome E. Singer, proposed a third theory of emotion, now known as the *Schachter-Singer theory*, or *two-factor theory of emotion*. The reason for the name two-factor theory is that they deduced from previous research that the experience of a particular emotion depends on two factors: physiological arousal and cognition. Schachter and Singer agreed with Cannon and Bard that the physiological distinctions between different emotional states were too non-specific to account for the full range of emotions. Unlike Cannon and Bard however, Schachter and Singer considered physiological arousal a *necessary condition* for the experience of emotion. But what, they asked themselves, could account for the variety in emotion if it was not explainable by physiological differences? Schachter and Singer asserted that, although physiological arousal was essential for the experience of emotion as such, it was subsequent *cognitive appraisal* that determined the exact nature of the resulting emotion. They argued that the context of a situation, expectations, previous experience and prior knowledge all informed such appraisal and thereby influenced the resulting emotion. In a rather ingenious experiment they obtained evidence that supported their theory (Schachter & Singer, 1962).

Starting in the 1960s, Richard S. Lazarus—another cognitive psychologist—conducted a series of experiments that were aimed at investigating the effects of appraisal on stress as well as emotions. In several of these experiments participants were shown films that provoked strong emotions. One film contained scenes showing a tribal circumcision-ritual and another showed shocking woodworking accidents in which someone was fatally impaled and another person lost fingers on a saw. Appraisal of these scenes was manipulated by giving different introductory orientations before the film. In one introduction (the so-called *denial* script) the participants were told that the people they would see in the film were actors, that the accidents were staged, or that the people weren't actually hurt or distressed by what happened. Other introductions *intellectualized* the films—they emphasized an anthropological perspective suggesting that the ritual was an interesting native custom, or that it concerned a safety film meant to prevent future accidents. These introductions were aimed at distancing the viewer from the raw emotional content. Another group of participants watched the films *without* an introduction and a fourth group heard a *trauma-script*, elaborating on the traumatic character of the scenes depicted in the movies. Starting shortly

before the introductory orientation and continuing throughout the film, the physiological reactions of the participants were monitored by measuring their galvanic skin response and heart-rate. In addition, the film was interrupted at short but regular intervals during which the participants were asked to observe and rate their emotional state. The outcome of these experiments suggested that the distancing and denial scripts led to significantly *reduced* levels of distress *and* arousal compared to watching the films without instructions. The trauma script led to *increased* levels of distress and arousal. Lazarus concluded that the instructions influenced the *cognitive appraisal* of the upsetting scenes and thereby changed the emotional reaction to them. In a publication in 1982 he used the results from these experiments to support his assertion that cognitive appraisal both *precedes* and *shapes* emotion (Lazarus, 1982). The results of these experiments suggest that cognitive appraisal not only has an effect on emotion, but that it can also have an effect on the level of *physiological arousal* associated with the emotion. This goes beyond the conclusions of Schachter and Singer, who took physiological arousal for granted as one of the factors giving rise to emotion. While for them cognitive appraisal was one factor giving rise to emotion and physiological arousal another, the experiments conducted by Lazarus show that the two factors are not independent.

Both the experiment of Schachter and Singer and the experiments of Lazarus involved cognitive manipulation of the participants. What is interesting in the experiment of Schachter and Singer is that providing participants with proper information about the expected physiological effects of an adrenaline injection resulted in a significantly reduced level of emotional *suggestibility*. Proper information about the expected physical symptoms appeared to prepare the participants to be aware of the physical effects when they arose and to enable them to distinguish these sensations from what was happening in the social field. Uninformed and misinformed participants were not consciously prepared and were far less able to properly distinguish what was happening in their body from what was happening in the social environment.

Cognitive appraisal and coping. Lazarus not only investigated the influence of cognitive appraisal on emotion, but also on the experience of stress. His findings were similar to those of Selye. In 1993, while looking back on his research he wrote: “We concluded that to understand what was happening we had to take into account individual differences in motivational and cognitive variables, which intervened between the stressor and the reaction.” (Lazarus, 1993, p. 4).

Many psychologists assumed such individual differences in the reaction to stressors were based on different *personality traits* and subsequently focused on mapping those. Lazarus and several other cognitive psychologists moved into a different direction. They put their attention to the cognitive process that according to them was mediating between stressor and reaction: *appraisal*. Lazarus defined appraisal as: “the process that (...) *actively negotiates* (...) between, on the one hand, the demands, constraints and resources of the environment and, on the other hand, the goal hierarchy and personal beliefs of the individual” (Lazarus, 1993, p. 6).

Later Lazarus proposed a theory of *coping* based on appraisal. His theory is closely reminiscent of Selye’s concepts of eustress and distress and they were both developed at approximately the same time. Lazarus saw coping as the psychological equivalent of Selye’s general adaptation syndrome: a response aimed at re-establishing psychological equilibrium by either successfully overcoming a stressor or by adapting to it. He distinguished two axes of cognitive appraisal that are at the basis of coping: *primary appraisal* in which the *impact* of a stressor is evaluated, and *secondary appraisal* in which one’s resources to deal with the stressor are evaluated. Both axes of appraisal occur at the same time and ultimately result in a personal decision as to whether the stressor is considered *harmful*, *threatening*, or *challenging*. Lazarus:

Harm refers to psychological damage that had already been done—e.g, an irrevocable loss. *Threat* is the anticipation of harm that has not yet taken place but maybe imminent. *Challenge* results from difficult demands that we feel confident about overcoming by effectively mobilizing and deploying our coping resources. (Lazarus, 1993, p. 5)

Coping, according to Lazarus, depends on the appraisal of whether one can *do* something about the situation caused by the stressor or *not*. Lazarus distinguished two possible ways of coping resulting from such appraisal: *Problem-focused* coping and *emotion-focused* coping: “If appraisal says something can be done, problem-focused coping predominates; if appraisal says nothing can be done, emotion-focused coping predominates.” (Lazarus, 1993, p. 10)

It is interesting to compare Selye’s, Lazarus’ and Schachter and Singer’s findings and theories with the late nineteenth century trauma models of Page, Charcot and Putnam and with Janet’s elaborate model of human psychological functioning. Although none of the twentieth century researchers were investigating trauma, the concepts of cognitive appraisal and coping, and the implied concept of emotional suggestibility shed a fresh light on the core

concepts contained in the nineteenth century trauma models, as well as those in Janet's theories about human psychological functioning.

Furthermore, the research related to the role of cognitive appraisal in the experience of emotions and in coping with stress suggests that the interplay of top-down and bottom-up processing referred to in Study 1 in relation to perception, extends to the experience of emotions and to the experience, the handling, and the effects of stress.

The neuroscience of fear conditioning—the work of Joseph LeDoux

After this excursion into the fields of *cognitive* psychology we return to the physical and physiological processes thought to be involved in emotion—this time particularly in the emotion of fear. Particularly since the beginning of the twenty-first century, neuroscience has progressed significantly. This has been attributed particularly to major improvements made in the field of brain-imaging technology. Yet, even before these technological advances were made, neuroscientists such as Joseph LeDoux started making discoveries that threw a new light on the relation between fear and neurological processes in the brain. Starting in the 1980s, LeDoux followed a line of approach similar to the one followed by Cannon and Bard 60 years earlier. Working mainly with rats, he combined brain surgery with fear-conditioning to determine as precisely as possible which areas and pathways in the brain are correlated with fear. The conditioning consisted in delivering an electric shock to rats while at the same time sounding a tone. Initially the rats would freeze when the shock was delivered, but not when they only heard the tone. After combining the tone with the shock several times, the rats would start to associate the tone with the shock and soon they would freeze on hearing the tone even if no shock was administered. They had been conditioned to respond with fear to the tone. Freezing—a brief form of immobility—was interpreted as a fear response. Once the rats had been conditioned to respond with fear to the tone, LeDoux proceeded as follows to determine the neural pathways associated with fear-conditioning:

I started from the outside. (...) I had the sound that produced the fear response. I wanted to know: How does that sound go through the brain and create the response? (...) Because the auditory pathways are fairly well worked out in mammals, I could use that as a starting point. I started with the top of the auditory pathway, which is the auditory cortex. I took that out, and the animals learned fine. Then I went down one station to the auditory thalamus, took that out, and they couldn't learn at all. So that meant that the sound had to go through the system to the level of the thalamus but didn't go through the cortex. So where was it going? (Johnson, 2003, para. 11-12)

The processing of auditory information is thought to happen in several different areas

in the brain, not only in the cortex. As LeDoux stated, taking out the auditory cortex didn't prevent the animals from learning the conditioned fear-response. Next he took out the auditory *thalamus*. Cannon and Bard considered the thalamus the source of emotional expression and experience, but, although emotion-related learning stopped after he took out the thalamus, LeDoux didn't share their conclusion. Nowadays the thalamus is considered a *relay center* of sensory input to the cortex (and motor output from the cortex). Taking out the relay center meant that the auditory stimuli were not relayed to the cortex—however, LeDoux had already determined that the cortex was not involved in the conditioning process, so, as he says, *where* was the thalamus relaying the auditory signal to? By using a tracer dye (and cutting up more rat brains) he discovered a neural pathway connecting the auditory output of the thalamus to the *amygdala*. Subsequently, removing the amygdala but *leaving* the thalamus, confirmed that the amygdala did indeed play a part in the learning process, because this procedure resulted in failure to learn the conditioned fear-response. Having come this far, LeDoux set out to discover and map the presumed neural pathways of fear as precisely as possible.

Basically LeDoux discovered that the neural signals related to threat travel along *two distinct pathways* in the brain. One pathway leads from the sensory nerves, through the thalamus, *directly* to the amygdala and appears to be involved in an *immediate* response to the threat. The other pathway also travels from the sensory nerves to the thalamus, but is then relayed to the *cortex* before going to the amygdala. This second pathway, the one which includes the cortex, is thought to enable more elaborate (cognitive) processing of a threat-signal, while the first one, which leads directly to the amygdala and bypasses the cortex, is thought to be involved in fast automatic processing and responses. LeDoux has dubbed these two pathways the *low road* and the *high road* (Dębiec & LeDoux, 2009; LeDoux, 1996).

The low road is very quick, involving only a single synaptic connection, it doesn't involve input from the higher cognitive processes associated with the cortex—in popular terms: it will make you react before you even consciously realize what the threat is. For this reason LeDoux also calls it “quick and dirty” (LeDoux, 1996). It can be entirely wrong or inappropriate in its assessment of a potential threat. For instance, it can mistake a dark spot in the corner for a dangerous spider, or the dark shape of a tree at night for an enemy.

The high road relays the initial sensory information via a more complex route over the sensory cortex to the amygdala. This response to the fear stimulus is slower and more sophisticated, opening the door to a more appropriate and realistic appraisal of the threat. The initial response to the threat-stimulus by the amygdala is thought to be moderated by the

processing taking place in the cortex. Thus, upon encountering a potential threat, the low road initiates an *immediate* automatic response and, a fraction of a second later, as the more sophisticated cognitive processes of the high road become involved, this first rough response is modified to a more appropriate reaction. From a survival point of view this set-up makes perfect sense. When a threat is *acute* an immediate and automatic reaction as initiated by the low road may be life-saving, but then, once a possible first impact has been avoided, this rough response needs to be inhibited as more sophisticated reactions are needed to avoid further damage.

The potential for fear-conditioning suggests that the automatic reactions triggered during activation of the low road can be associated with situations and circumstances to which they were not previously associated. Animals and humans can be conditioned to react with a fear-response to circumstances to which they did not react with a fear-response before. Possibly, part of the high road is initially involved in such learning, when new associations are learned through involvement of neural pathways belonging to the thalamo-cortical-amygdala route. But, once associations *have* become established, cortical pathways no longer seem necessary to put them into action: they become automatic and only use the swift thalamo-amygdala route. Furthermore, once such associations have been established they turn out to be very persistent: it is difficult to undo them (Dębiec & LeDoux, 2009; LeDoux, 1996).

LeDoux touches upon such questions as *how* a momentary encounter with a threatening circumstance can have long lasting effects, and connects certain anxiety disorders such as PTSD to persistent fear-conditioning. In other words, with his work LeDoux has created a neuroscientific model that explains traumatic disorders as a form of fear-conditioning.⁴⁵

Contemporary trauma models

The defense cascade

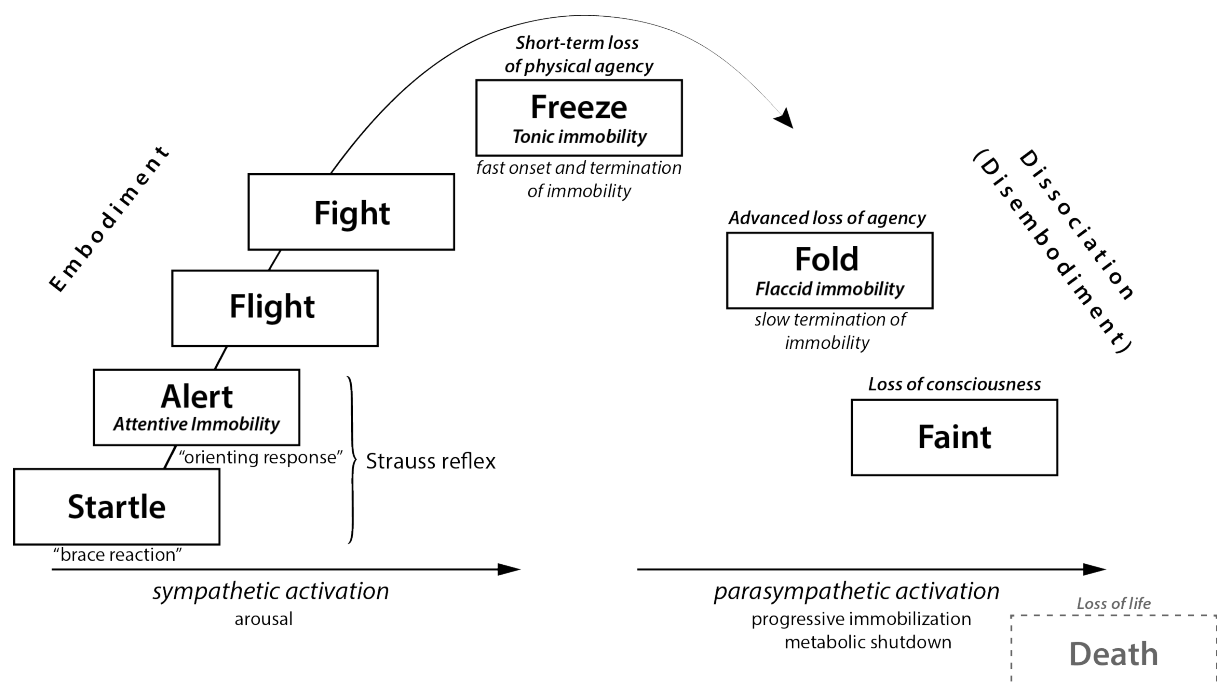
Observing the reactions of animals to threat and restraint, ethologists have established a natural sequence of behavioral reactions to the imminent threat (see e.g. Gallup, 1974; Marks, 1987; Volchan et al., 2017). This sequence of behavioral reactions is also referred to as the *defense cascade*: “It seems that the defense process is a chain-linking sequence of steps

⁴⁵ Apart from Dębiec & LeDoux (2009), the sources used in this subsection are mostly popular scientific. For a more thorough scientifically-grounded account see: LeDoux, J. (2014). Rethinking the Emotional Brain. In J. Dębiec, M. Heller, B. Brożek, & J. LeDoux (Eds.), *The Emotional Brain Revisited* (pp. 13-83). Copernicus Center Press. (2012) .

that build on each other like a cascade” (Schauer & Elbert, 2010, p. 110). Peter Levine (2010) describes the different stages of this cascade with the acronym “the A and four Fs” . They stand for: (1) Alert, (2) Flight, (3) Fight, (4) Freeze and (5) Fold. The second and third stage, usually referred to as the *fight-or-flight response*, have become quite well-known since they were first described physiologically by Walter Cannon (Cannon, 1915). The other stages are less well-known. There are presently several different models describing the specific stages in this sequence. Most confusingly the first stage, which Levine has labeled *Alert* is referred to as *Freeze* by most other researchers. Maggie Schauer and Thomas Elbert, part of whose model will be described further below, describe the defense cascade as consisting of six stages. The acronym for the stages of their model consists of 6 *F*s, which stand for: (1) Freeze, (2) Flight, (3) Fight, (4) Fright, (5) Flag and (6) Faint.

Figure 10

The defense-dissociation sequence



Note. The complete human defense-dissociation sequence. Enhanced from P. de Wit. *Learning to breathe from the breath itself: An introduction to Rebirthing-Breathwork and a phenomenological exploration of breathing.* Author/KDP; 2016, p.73.

Particularly with regards to human threat-induced behavior, I have renamed this cascade the *defence-dissociation sequence* (de Wit, 2016; de Wit et al., 2018). The initial reaction to a threat usually consists of a brace reaction (startle-response) followed by attentive immobility, which is also referred to as the *orienting response* (de Wit & Cruz, 2019). Together they are known as the *Strauss reflex*, which, during early infancy replaces

the *Moro reflex* (Goddard Blythe, 2014). Because a *cascade* implies movement in a single direction (with the exception of salmon) I prefer to use the term sequence, since some of the stages can be followed in reverse (e.g. from freeze to flight or fight). See Figure 10 for a schematic representation of the defense-dissociation sequence. The models of the defense cascade as used by Levine, Schauer and Elbert, and others are comparable to the sequence depicted here, but sometimes use different terms and leave out certain stages.

In the next two subsections, I will describe two contemporary trauma models that are closely related to the *defense cascade*. They are Peter Levine's model of fear-potentiated immobility, and Schauer and Elbert's model of defense cascade mechanisms.

Fear-potentiated immobility

In several of his writings Peter A. Levine tells the story of his first encounter with a traumatized client and how he was able to help her. This encounter took place in July 1969 and coincided with another historic event: astronaut Neil Armstrong's first steps on the moon. The encounter marked Peter Levine's first steps into a new career. Twenty-seven years old, he had just started working as a therapist. His interest lay in what he calls: "the fledgling fields of stress and mind-body healing" (Levine, 2010, p. 20). The client, "Nancy" (not her real name), was referred to him by a psychiatrist who knew of Levine's interest and who thought she might benefit from the relaxation and stress-reduction techniques he was developing.

Levine tells us that Nancy, a 24-year old woman, was suffering from severe panic-attacks and agoraphobia that made it difficult for her to go out on her own. She had also developed a host of other debilitating conditions such as fatigue, hyperthyroidism, frequent migraines, chronic pain and premenstrual syndrome. When she entered his office, clinging to her husband for support, Levine noticed the tenseness of her neck and shoulders, the way she pulled her neck in and the wide eyes that gave her the startled appearance of a "deer in the headlights". He also noticed her fast heart-rate and her extremely shallow breathing.

Following his first observations Peter Levine started working with Nancy's tense neck and shoulders. He guided her to bring her awareness to her neck and shoulders, to feel into the sensation of the tightness of her muscles and to gradually release it. Nancy appeared to respond well to this: she started to relax deeply, her heart-rate slowed down and her breathing deepened. But suddenly she became acutely agitated. Her heart-rate shot up, as did her breathing-rhythm and her breathing became shallow and erratic. Then (in Levine's words):

as I watched helplessly she abruptly froze in terror. Her face turned deadly white. She appeared paralyzed and barely able to breathe. Her heart seemed to almost stop,

dropping precipitately to about 50 beats per minute (...). Fighting my own impending panic, I was at a loss as to what to do. “I’m dying. Don’t let me die,” she pleaded in a small taut voice. “Help me, help me! Please don’t let me die. (Levine, 2010, p. 20)

I became quite frightened. Had I paved the yellow brick road to hell? We entered together into her nightmarish attack.

Surrendering to my own intense fear, yet somehow managing to remain present, I had a fleeting vision of a tiger jumping toward us. Swept along with the experience, I exclaimed loudly, “You are being attacked by a large tiger. See the tiger as it comes at you. Run toward that tree; climb it and escape!” To my surprise, her legs started trembling in running movements. She let out a bloodcurdling scream (...). She began to tremble, shake and sob in full-bodied convulsive waves.

Nancy continued to shake for almost an hour. She recalled a terrifying memory from her childhood. When she was three years old she had been strapped to a table for a tonsillectomy. The anesthesia was ether. Unable to move, feeling suffocated (common reaction to ether), she had terrifying hallucinations. (Levine, 1997, p. 29)

By the end of the session Nancy reported a strong sense of peacefulness that “held her in warm tingling waves” (Levine, 2010, p. 21). After her cathartic release Nancy experienced no further panic attacks or agoraphobia. Over time her other symptoms improved dramatically, some disappearing altogether. And, writes Levine, she reported feeling “more alive and happier than [she could] remember” (Levine, 2010, p. 22).

At the time of the breakthrough with Nancy, Peter Levine was studying predator-prey behavior of animals. Apart from the fact that in hindsight he is “quite certain that these studies strongly influenced the fortuitous vision of the imaginary tiger” (Levine, 1997, p. 30), following the session he became greatly intrigued by the similarity between Nancy’s paralysis during her panic attack and the immobility displayed by prey animals when caught by a predator. Over the years, as his experience with traumatized people grew, he came to the realization that the debilitating effects of trauma were due to the fact that the traumatized person, to a certain extent, remains *stuck* in the frozen state of immobility. In addition he believes that the *raw survival energy* which was mobilized during the traumatic experience but remained unused, doesn’t just disappear. According to Levine the nervous system *remains* charged with it—it is like a compressed spring that keeps putting pressure on the traumatized individual from within.

According to Peter Levine the convulsive shaking and trembling displayed by Nancy after her imaginary escape from the tiger is of greatest significance. He points to the

observation that animals that are caught by predators but manage to escape display similar symptoms shortly after their escape. Levine sees the powerful shaking and trembling as the body's way to *complete truncated survival movements* and thereby to *discharge unused survival energy*—he believes that this release *resets* the nervous system. Elsewhere he writes:

How do wild animals successfully return to their normal state?

The answer lies in the particular type of spontaneous shaking, trembling, and breathing that I described earlier. I remember that when I shared my observations about animal behavior with Andrew Bwanali, chief park biologist of the Mzuzu Environmental Center in Malawi, Central Africa, he nodded excitedly, then burst out:

“Yes ... yes ... yes! That is true. Before we release captured animals back into the wild, we make absolutely sure that they have done just what you have described.”

He looked down at the ground, then added softly, “If they have not trembled and breathed that way before they are released, they will not survive. They will die.”⁴⁶

Although humans rarely die from trauma, if we do not resolve it, our lives can be severely diminished by its effects. (Levine, 2008, para. 11-14)

Levine understands trauma as the result of the specific interplay of two principle elements: *fear* and *immobility*. The opposing tendencies of the urge to *suppress* the undischarged energy and its inherent *drive for completion* potentially create a *vicious circle*. The unused and undischarged survival energy wants to emerge, powerful as it is, perhaps in the form of rage or terror, perhaps as physical sensations or movements (e.g. shaking/trembling). When a subject senses its imminent emergence they may become *afraid* (or at the very least thoroughly *uncomfortable*) and repress it. Such repression may occur means use of will-power or by means of drugs or medication. They effectively *immobilize* themselves as soon as they sense the dreaded imminent eruption. Although they may succeed in temporarily numbing themselves and although the impulse may be temporarily suppressed, the unfinished action is still there and will be reactivated by a relevant trigger. For instance, surrendering to deep relaxation, inadvertently also relaxes suppressive control. Not used to remain fully vigilant while relaxing, the emerging energy catches the subject unawares and

⁴⁶ The importance of spontaneous recovery from a freeze response has been emphasized by others too. Seligman mentions an (unpublished) experiment with baby chicks carried out by Ginsburg. The researcher induced the immobility response in two groups of chicks by restraining them. One group was allowed to recover spontaneously from the induced immobility, while the other group was forced out of it by repeatedly prodding their chest with a finger. Subsequently the researcher measured the resilience against drowning of both groups, and of a third (control) group of chicks which hadn't been immobilized. The group which was forced out of their immobility drowned quickest, the control group ended second and the group that was allowed to recover spontaneously survived longest. Seligman, M. E. P. (1975). *Helplessness: On Depression, Development and Death*. W. H. Freeman. (p. 173)

threatens to overwhelm them. Perhaps this time the only available resource to control it is by reacting purely instinctively and suppressing the emerging energy with an involuntary, full blown *freeze-response*. This intense, reflex-like freeze-response and its associated state of helplessness gives rise to another wave of fear. This is what happened to Nancy during her session with Levine. When there is no-one to coach the subject into a safe reactivation and a contained and complete discharge of the energy, the freeze-response moves inward. It becomes an instinctive contraction in the deeper layers of being, a protective armor around the feared survival energy. This protective armor is effectively a form of self-induced immobility.

Ultimately the subject's reactions to the undischarged energy turns into a vicious cycle of *fear* and *immobility*. When the impulse inherent in the truncated survival action surfaces they panic and *freeze*. The subject *immobilizes* the surfacing impulse by immobilizing themselves. This fear/freeze/fear-cycle is reinforced every time it is invoked. Thus, as a result of an individual's unresolved reactions to a threatening situation (or situations), fear and immobility develop into each other's *conditioned responses*—they become entangled: one leading to (or, as Levine puts it: *begetting*) the other. Levine calls this mechanism: *fear-potentiated immobility* (Levine, 2010). According to him this is the mechanism behind long-term traumatization .

Like other trauma researchers Peter Levine points at two poles between which the manifestations of trauma move. One pole is characterized by a dominance of symptoms related to *hyperarousal*; the other by a dominance of *hypoarousal* or *withdrawal*-related symptoms. *Hyper*-arousal indicates activation of the sympathetic nervous system. As it attempts to surface, the undischarged survival energy brings forth the fight- and/or flight responses associated to it, thus leading to an activation of the sympathetic nervous system. This is the state in which volatile emotions such as rage and terror are lurking just below the surface and in which the vicious cycle of fear-potentiated immobility becomes most prominent. Levine associates this pole of trauma with the stage of *tonic immobility*. *Suppression* has the same *contracting, protective* quality, only in this case it doesn't protect against a threat coming from *outside*, but prevents a threat coming from *within* to the surface. *Hypo*-arousal and withdrawal, on the other hand, are manifestations of a *deeper* state of trauma. Peter Levine associates this form of trauma with *flaccid immobility*. Flaccid immobility is accompanied by local or general *muscle-collapse* and by numbing and withdrawal of consciousness into dissociation. In established trauma it manifests as a similar state of collapse and withdrawal and as a strong tendency towards dissociation. Levine:

In two sentences: trauma occurs when we are intensely frightened and are either physically restrained or perceive that we are trapped. We freeze in paralysis and/or collapse in overwhelming helplessness. (...) In freezing, your muscles stiffen against a mortal blow and you are “scared stiff”. On the other hand, when you feel death as unequivocally imminent (as when bared fangs are ready to annihilate you), your muscles collapse as though they have lost all their energy. In this default reaction (when it has become chronic, as it does in trauma), you feel that you are in a state of helpless resignation and lack the energy to fuel your life and move forward. This collapse, defeat and the loss of the will to live are at the very core of deep trauma.

When comparing Levine’s trauma model with other contemporary trauma models with regards to the two polarities mentioned earlier and depicted in Figure 9, it stands out in several ways. First of all, at the heart of the concept of fear-potentiated immobility lies an element of intention / control. Animals appear to liberate themselves from the effects of a traumatic encounter by allowing their bodies to shake and tremble. This liberation through shaking and trembling is what Levine considers a natural *disposition* that humans share. By not allowing their bodies to tremble and shake, humans effectively *suppress* this natural disposition. Although, according to Levine, this suppression is motivated and fueled by fear, it is *intentional* (i.e. it has as its goal *not* to experience the trembling, shaking, rage and other experiences related to discharging the traumatic experience). Although the nature of the behavior that seeks to express itself is seen as *biological* (undischarged energy related to truncated survival actions), its suppression is intentional and has a psychological component.

Schauer & Elbert

Schauer and Elbert (2010) approach the behaviors displayed during the defense cascade from the perspective of *evolutionary adaptation*. They particularly focus on how the specific behaviors of the cascade optimize survival and how they could therefore be explained as a result of natural selection during millennia of human and pre-human evolution. Here I will focus on their understanding of *dissociation*. In their attempt to understand it, they interpret three key phenomena that accompany dissociation and sum them up as: *functional sensory deafferentation*, *motor paralysis* and *loss of language functions* (Schauer & Elbert, 2010, p. 113). “Functional sensory deafferentation” refers to an interruption of the nerve impulses coming from the sense organs, in particular at the point where they are relayed through the thalamus. “Motor paralysis” refers to advanced stages of immobility. This is no longer the stage of tonic immobility—referred to earlier. Advanced stages of immobility can be referred to as *flaccid immobility* (“fold”) and loss of consciousness (“faint”)—see also

Figure 10. “Loss of language functions” refers to the inability to use speech. This “loss of language functions” is associated with dissociation and immobility—for example it is frequently reported as an experience during rape, when victims find themselves unable to cry out for help.

Schauer and Elbert see dissociation as going hand-in-hand with advanced stages of immobility. Both dissociation and immobility are interpreted as ultimate attempts at damage-control and physical survival. In the case fight and flight are too risky and could jeopardize survival, the “system” needs to shut down to such an extent that these actions are no longer possible. Tonic immobility has a fast onset and termination, which means that the subject can easily regain agency and flee (or fight) when an opportunity presents itself. Advanced stages of immobility do not have fast termination and involve a deeper state of paralysis. During tonic immobility the subject is still *acutely conscious*, although active behavior (including speech in humans) is impaired. During flaccid immobility consciousness is reduced and attention is turned away from the actual situation. In fainting consciousness is lost. According to Schauer and Elbert, advanced immobility prevents potentially damaging action, while dissociation counteracts the *felt necessity* for such action (because dissociation abolishes the experience of pain). Here is a summary of Schauer and Elbert’s hypothesis in their own words:

To summarize, we postulate that dissociation is adaptive and manifests itself behaviorally on three dominant levels as life-threat escalates: (1) rise of and finally complete functional sensory deafferentation, (2) decline of and finally absence of efferent motor commands, and (3) decline of and finally absence of speech perception and production. If motionlessness of a human organism is of crucial importance in such moments of life-threat, nature needs to take care of systems that might corrupt adaptive behavior – sensation, movement, and speech. As long as the victim can feel pain and anger and is able to act, he or she will attempt to move away from the aversive stimulus or fight it off. When the organism is about to be attacked, immobility tends to be combined with analgesia, which is functional in that perception of pain would divert attention of the prey from defensive concerns (...). Furthermore, tonic immobility is combined with numbing for anger affect, whilst at the same time fear emotions reach their maximum. In order to enable a maximal defensive and “dead” appearance (“as if dead,” “playing possum”), which provides survival advantage by complete giving in, and cessation of fighting, and moving, perceptions and later emotions need to be switched off or deactivated. To

guarantee motionlessness in these highly perilous situations, the organism should be unable and unwilling to use voluntary muscles and should feel neither anger nor pain, be finally emotionally numb, as if anesthetized. During this cascade numbing of sensations, analgesia and anger inhibition are followed, at a later stage, by numbing of fear as well. These effects inhibit reactions, which would compromise optimal protection in this stage of imminence. (Schauer & Elbert, 2010, p. 113)

I would like to stress that Schauer and Elbert's model hinges completely on the Darwinian concept that the stages of the defense cascade are evolution-based adaptations, developed purely to enhance *physical survival*. In the ultimate stages the defense process therefore *has* to be automatic and completely involuntary. To be fully *adaptive* it has to be able to withstand attempts by the victim to resist it—everything has to be subordinate to it. Dissociation, according to this interpretation, is necessarily completely involuntary.

Looked at from the point of view of the two polarities presented in Figure 9, Schauer and Elbert's model is firmly biological and predispositional. The predisposition is evolutionary and applies to most species. Particularly in the stages of advanced immobility, any individual intention is completely subordinate to this evolutionary disposition.

Limbic Kindling

In the late 1960s, while performing a series of experiments involving weak electrical stimulation of the amygdala in rats, neuroscientist Graham V. Goddard and his students observed that in a number of rats repeated stimulation of the amygdala led to manifestations of epileptic behavior (Goddard et al., 1969). What they discovered was that initially, shortly after delivering the electric impulse, the stimulated neurons would spontaneously fire with what is called an *after discharge* (AD). These ADs would subsequently spread and recruit other parts of the brain and also appeared to have a tendency to *oscillate* between different neural structures, as if being passed back and forth. Continued stimulation would lead to a lowering of the threshold for such neural activity and to an increase in its complexity. With this increase in complexity outer behavioral manifestations in the form of seizure activity would start to occur. Based on their observations they suggested a model for this activity which they called *kindling*. Similar to how a small flame introduced into a bundle of kindling sticks spreads and eventually generates a proper fire, the small ADs spreading and oscillating between different neural structures were believed to lead to the more intense neural activity supposedly underlying the epileptic seizures. Continuing regular stimulation in the rats would gradually lead from mere facial twitching to full tonic-clonic seizures and eventually to spontaneous, *unstimulated* manifestations of epilepsy. It was concluded that kindling had to

involve permanent or at least long-term changes in the brain, establishing *self-perpetuating* neural circuits. The areas most susceptible to kindling were found to lie in the *limbic* part of the brain, which includes hippocampus, amygdalae, thalamus, fornix, limbic cortex and septum.

Over the years kindling has served as an important model to explain the mechanisms behind *temporal lobe epilepsy*—especially where it resulted from earlier trauma to the brain (Scaer, 2001). Here the initial trauma, caused by a head injury for example, was believed to lead to neuronal propagation accompanied by spontaneous electric discharges. These discharges would gradually spread and kindle more complex neural activity, ultimately resulting in epileptic seizures. Apart from epilepsy, in more recent years the model has also been adopted to explain specific forms of bipolar disorder and certain types of previously unexplainable violent criminal behavior (Scaer, 2001).

Robert C. Scaer suggests that clinical disorders related to trauma such as PTSD, can also be explained by the model of kindling (Scaer, 2001). Scaer proposes that during an “acute arousal stimulus” (a traumatic experience), the amygdala may be exposed to “overwhelming internal and external arousal cues” (Scaer, 2001, p. 78). His hypothesis is that these overwhelming arousal cues have a similar effect on the amygdala as the continued electric stimulation in Goddard’s original experiments or as certain head injuries that lead to temporal lobe epilepsy. Scaer suggests that in the case of trauma the resulting changes in the neural circuits don’t lead to epilepsy, but to trauma-related disorders. Scaer: “[these] overwhelming (...) arousal cues [could promote] the kindled development of pathways producing the clinical syndrome of PTSD” (Scaer, 2001, p. 78).

Referring to research that relates the occurrence of *dissociation* to the likelihood of developing PTSD (van der Hart & van der Kolk, 1989), Scaer proposes that dissociation may play an active role in the genesis of these proposed kindling processes in the brain. He suggests that the neural processes thought to underlie dissociation could *potentiate* the kindling processes between the neural centers for memory and arousal and thereby lead to the symptoms associated with PTSD:

The potential for dissociation to occur will predictably be greatly enhanced by a prior history of trauma and dissociation. This state of altered memory, perception and autonomic function may potentiate kindling between centers for memory and arousal (amygdala, hippocampus, locus ceruleus) that we have described above. The resulting self generated and maintained kindled loop will then serve as the substrate for development of clinical PTSD. (Scaer, 2001, p. 79)

Scaer explains how these kindled processes could lead to PTSD-related syndromes by comparing the long-term exposure to such self-generated neural processes to the long-term exposure to stressors during chronic stress:

Selye (1936) has generally been credited with the concept that prolonged or excessive exposure to stress could contribute to the development of a group of specific diseases. ... Many of these effects are now well described in the medical and lay literature as “diseases of stress”.

The relationship of the long-term effects of trauma (as opposed to stress) and disease are less well documented. Whereas ongoing stress is easily identified, the past experience of traumatization is masked by the evolution of the resulting syndrome into experiences, symptoms and behaviors that ultimately are attributed to characterological and psychological causes that is, that are due to internal rather than external events. This perception is basically correct in that the internal events in trauma are self-driven and capable of changing somatic physiology in the absence of external influences. This concept is also in keeping with the physiologic effects of somatic dissociation, which are driven by internal brain-based mechanisms that are self-perpetuating. (Scaer, 2001, pp. 84-85)

Scaer’s article is based on a keynote address he gave at an annual meeting of the *Association for Applied Psychophysiology and Biofeedback* in 2000 in Denver and it is well worth reading. Scaer eloquently presents the main trauma-related research and theories of the last century and integrates them into his hypothesis.

But read carefully and note where his hypothesis leads him. First, by introducing the idea of limbic kindling into trauma-theory Scaer doesn’t merely suggest that the body gets stuck in the trauma-response: through kindling it *actively reproduces the trauma-response in a self-perpetuating loop*. Scaer then draws an analogy between these internal, self-perpetuating physiological processes and the lasting persistence of stressors during chronic stress, both leading to long-term exposure. This could potentially answer questions such as why, even when the traumatic event itself is gone, the body keeps reacting as if it were still there. However, not only the body keeps reacting as if the traumatic event was still there, the mind seems to do so as well. How does Scaer explain that? Initially he infers that (brain-based) memories of sense impressions and bodily responses during the traumatic event are incorporated into the kindled trauma-response, thereby explaining phenomena such as intrusive memories: flashbacks, nightmares etc. (The memories are incorporated in the kindling-loop; they become activated during the kindling and thereby give rise to flashbacks

etc.). In two masterfully constructed sentences in the final paragraph of the last quote above, Scaer subtly suggests that *psychologically internal* events equal *self-driven physiologically internal* events. If we compare his suggestion with the two polarities presented in Figure 9, the vertical polarity collapses completely as psychological *becomes* biological. The other polarity doesn't feature in Scaer's model. The kindling is obviously not intentional, and Scaer doesn't refer to any dispositional aspects. In fact, such kindling, if it were the cause of traumatic disorders, would be nothing more than a fluke of nature.

Scaer sees the specific subjective experiences of long-term traumatization as an unfortunate byproduct of the actual traumatization; and *traumatization itself* is defined as a series of *self-perpetuated processes* in the brain resulting from exposure of the amygdala to overwhelming arousal cues. In this definition trauma doesn't turn out to be a (psychological) *wound* at all, but rather a series of self-perpetuated physiological processes in the brain. The concept is not unlike that of a series of self-generating inner *echoes* of a sound, continuing long after the original sound has fallen silent, while the hearer keeps on reacting to the echoes as if they *were* the original sound.

In his article Scaer introduces at least two other, trauma-related ideas: he links the *whiplash syndrome* to the same mechanism of kindling and redefines it as a *psychosomatic* reaction to trauma; secondly he discusses the phenomenon of *conversion* in depth, defining it as a form of *somatic dissociation*. (Conversion, which can follow a traumatic experience, involves the manifestation of physical deficits that defy physiological explanation by examination, laboratory tests or imaging studies. It featured in the early trauma and trauma-related models of Page, Charcot, Oppenheim, Putnam and Janet).

Scaer also integrates Stephen Porges's polyvagal theory into his hypothesis. Polyvagal theory, which is briefly introduced in Appendix 7, provides an explanation for most of the behaviors symptomatic of trauma-related disorders such as PTSD. Scaer suggests that the kindled processes in the brain continue to engage the body in reactions related to the defense cascade—they keep activating the physiological responses to potentially traumatic experiences. On the one hand then, these kindled processes may lead to a disabling of the *ventral vagal complex* (VVC—see Appendix 7), resulting in disinhibition of the *sympathetic nervous system* (SNS), leading to states of *hyperarousal*, *inability to engage socially* and ultimately to a state of *exhaustion* reminiscent of the third phase of the *stress-response*; or, on the other hand, they may lead to a disabling of *both* the VVC *and* the SNS, resulting in dominance of the primitive *dorsal vagal complex* (DVC—see Appendix 7), leading to states of *hypoarousal*, *withdrawal* and ultimately to depression or *dissociative disorders*.

Alternations between these two opposite physiological (and psychological) reactions are also possible, when the body oscillates from one trauma-response to the other.

The model presented by Robert Scaer, integrating many other proposed theories and research findings, offers probably the best scientific hypothesis presently available of how trauma *could* work if it were merely a series of physiological processes in the body—if it were merely a mechanical *hardware* problem, so to speak. His model remains purely theoretical however, no empirical evidence has been found that links limbic kindling to traumatic disorders.

Adaptive Information Processing

Eye movement desensitization and reprocessing (EMDR) is a therapeutic approach that has been shown to be relatively effective in treating symptoms related to traumatic stress disorders (e.g. Foa et al., 2009; van der Kolk, Spinazzola, et al., 2007; Wilson et al., 1997). The theory at the heart of EMDR concerns the processing of experiences (“incoming sensory perceptions” and associated emotions—see second quote and footnote below). Francine Shapiro, who discovered EMDR, has called this theory *adaptive information processing* (AIP) (Shapiro, 2001). AIP is essentially a learning theory. It is grounded in the idea that memories are stored in *neurological networks* in the brain. Solomon and Shapiro (2008) state: “the AIP model posits the existence of an information processing system that assimilates new experiences into already existing memory networks. These memory networks are the basis of perception, attitudes, and behavior.” (Solomon & Shapiro, 2008, p. 316).⁴⁷

And:

When working appropriately, the innate information processing system “metabolizes” or “digests” new experiences. Incoming sensory perceptions are integrated and connected to related information that is already stored in memory networks, allowing us to make sense of our experience. What is useful is learned, stored in memory networks with appropriate emotions, and made available to guide the person in the future. (Solomon & Shapiro, 2008, p. 316)

⁴⁷ In the next sentence Solomon and Shapiro state: “Perceptions of current situations are automatically linked with associated networks” and they refer to an article about the retrieval of emotional memories by Tony Buchanan (Buchanan, T. W. (2007). Retrieval of Emotional Memories. *Psychological Bulletin*, 133(5), 761-779. <https://doi.org/10.1037/0033-2909.133.5.761>). This sentence implies more than what Buchanan’s article states. The association which Buchanan’s article refers to is primarily linked to the *emotion* experienced during a perception. This perception triggers the retrieval of a memory with a similar emotion. Solomon and Shapiro imply much more, they imply that the perception is linked to a memory network that informs “attitudes and behavior” and that the perception enhances what is already “learned” in the network with regards to the appropriate attitudes and behavior (see the next quote).

AIP essentially refers to a *healthy* system that processes the information contained in new experiences by assimilating it into what has been learned from previous experiences. The processed information from new experiences is believed to be “assimilated” into existing neurological networks and thereby *enhances* the information previously stored in these networks. Thus it is believed to improve the “basis of perception, attitudes, and behavior” (Solomon & Shapiro, 2008, p. 316). Solomon and Shapiro imply that this is what constitutes learning.

Stickgold (2002) describes the presumed (“putative”) neurobiological *mechanisms* underlying the AIP model. Building on the synthesis provided by Schacter and Tulving (1994), Stickgold describes three so-called *memory systems* and how they are thought to interact in the processing of new experiences. These three systems are the *perceptual representation system*, the *semantic memory system*, and the *episodic memory system*. Referring in particular to McClelland et al. (1995), Stickgold roughly relates the perceptual representation system with *unimodal sensory cortices*, the semantic memory system with the *neocortex* and the formation of long-term memories—predominantly related to the episodic memory system—with the *hippocampus*. The *association cortex* is thought responsible for the connecting pathways—particularly between the unimodal sensory cortices and the neocortex (semantic memory system) and between the hippocampus (episodic memory system) and the neocortex (semantic memory system).

According to Stickgold, the “perception of an event” (an experience) results from the processing, in higher cortical regions, of “separate internal representations of a stimulus in each sensory modality” (Stickgold, 2002, p. 63). These separate representations are formed in the sensory cortices.

From the unimodal sensory cortices information pathways lead to the association cortex, which also passes the information to the areas in the neocortex associated with the semantic memory system. These pathways enable the ascribing of *meaning* to the perception. The meaning is retrieved from the semantic memory system. However, this is not a unilateral process, because every activation of a network that is part of the semantic memory system is believed to also modify the network itself—however so slightly.

Formation of *long-term* memories requires the involvement of the hippocampus. The hippocampus is thought to facilitate the *simultaneous reactivation* of—what Stickgold refers to as—“weak cortical traces” in the perceptual representation system and the semantic memory system (Stickgold, 2002, p. 65). It may also activate the amygdala, which is believed to facilitate access to emotions associated with the perceptual and semantic memory traces.

This simultaneous reactivation of perceptual traces, and associated meaning and affect through the hippocampus is what is thought to enable conscious recollection of an event.

The consolidation of meaning in the semantic memory system is thought to involve the repetitive replay of episodic memories from the hippocampus to the neocortex. In this way, it is inferred, specific information contained in episodic memories is “incorporated into ... general semantic knowledge” (Stickgold, 2002, p. 66). The simpler aspects of this semantic consolidation process could occur in what Stickgold refers to as “real time”, while the more complex processing is thought to occur “off-line”, when we are reminiscing, or during sleep. As the relevant information from an episodic memory is abstracted and consolidated into the semantic memory system, the episodic memory becomes obsolete and fades away.

Stickgold distinguishes two forms of information processing during sleep. They coincide with REM sleep and non-REM sleep. During non-REM sleep the neural pathways from the hippocampus to the neocortex are active and it is during this activation that the relay of relevant information from episodic memories, and its consolidation into semantic knowledge is thought to occur. During REM sleep the sensory cortices, the neocortex and the amygdala are active, while there is no information flow from hippocampus to neocortex. Stickgold infers that during this stage *weak connections* (“weak associations”) between the perceptual representation system and the semantic memory system are activated. Stickgold:

The preferential activation of weak associative links with the neocortex enhances the testing of semantic associations most likely to result in the “discovery” of valuable new relationships between older memories. In addition, while hippocampal outflow to the cortex during non-REM sleep may serve to reinforce old memories, blocking hippocampal outflow during REM will help prevent semantic associations from falling back into more predictable, over-learned patterns and will favor the formation of new associative links necessary for understanding the meaning of events in our lives. (Stickgold, 2002, p. 69)

Disrupted information processing during traumatic disorders. Ideally, the process described above is how human beings process new experiences, according to Stickgold. New experiences are integrated into existing neural networks. One aspect of this integration is that the association cortex establishes connections between perceptual representations and the semantic memory system. Through this process perceptions are connected with already

established concepts and given meaning.⁴⁸ In addition perceptual representations can (subtly) modify the network in the semantic memory system, which means that the concepts themselves can be modified in this process. The other aspect of the integration is that through the connection of the hippocampus with the neocortex and repetitive replay of episodic memories, meaningful information is extracted from these memories and consolidated in the semantic memory system. This can also result in modification of the semantic memory system and thereby constitute learning.

Stickgold infers that in the case of *posttraumatic stress disorder* the consolidation process fails. The episodic memories remain strong and relevant semantic information is not abstracted and integrated into existing networks via the semantic memory system. Stickgold: “The breakdown of this normal process of memory transfer and integration leads to the continued maintenance of the episodic memory and its affect in an inappropriately strong and affect-laden form” (Stickgold, 2002, p. 67). This appears to be connected to a disturbance of the processes that normally take place during sleep:

When traumatic episodic memories are repetitively replayed in sleep, it is an indication that this system has broken down. Outside of PTSD, episodic memories are almost never replayed veridically in dreams (Stickgold et al., 2001). Although dreams contain “day residue,” this is usually in the form of factoids, not contextually accurate images or stories. Day residue enters our dreams as a character or phrase from the day, as an emotion or similar situation. But it does not appear as a replay of an actual event. For such a replay to occur would require the breakdown of the normal blockade of hippocampal outflow to the cortex, which, we propose, prevents the normal integration and subsequent weakening of the episodic memory. It is this sequence of events that we believe leads to PTSD. (Stickgold, 2002, p. 69)

PTSD is an indication that AIP is disrupted. Stickgold infers that the mechanism behind this disruption is biochemical in nature. He describes the mechanism, but gives no possible cause for the biochemical disturbance. Enhanced levels of adrenaline lead to hyperarousal and hypervigilance and a disturbed REM/non-REM cycle. During REM sleep, adrenaline release is normally inhibited in the brain. Continued release of adrenaline could lead to a disrupted REM cycle, in which the neocortex keeps receiving information from the hippocampus, permitting the repetitive replay of traumatic memories. As it keeps receiving

⁴⁸ This should remind the reader of the idea of cognition (the synthesis of percept and concept) described by Steiner, as well as the bottom-up/top-down model of perception proposed by cognitive psychologists—both described extensively in Study 1 of this thesis.

information from the hippocampus, the cortex can't establish weak associations and integration of the episodic memories fails. The episodic memories do not become obsolete and continue as they are. Stickgold concludes: "the consequence of this chain of events would be the self-sustaining condition of PTSD" (Stickgold, 2002, p. 70).

Returning to Solomon and Shapiro (2008), Shapiro refers to the neurological networks into which relevant information from episodic memories is integrated as *adaptive networks*. She posits that:

a particularly distressing incident may become stored in *state-specific form*, meaning frozen in time in its own neural network, unable to connect with other memory networks that hold adaptive information. She hypothesizes that when a memory is encoded in excitatory, distressing, state-specific form, the original perceptions can continue to be triggered by a variety of internal and external stimuli, resulting in inappropriate emotional, cognitive, and behavioral reactions, as well as overt symptoms (e.g., high anxiety, nightmares, intrusive thoughts). (Solomon & Shapiro, 2008, p. 316; emphasis added)

A trauma model based on human development

A comprehensive trauma model

Apart from Freud's psychological explanation that traumatic neurosis is based on a conflict of motives that remains unconscious, and that the patient "solves" this conflict by "escaping" into neurotic symptoms (Freud, 1955), all trauma models since Erichsen's model of the railway spine (Erichsen, 1866, 1882) rely on physiological explanations to illuminate the phenomena associated with (post)traumatic disorders. Some models are purely physiological in nature, while others also take psychological and cognitive factors into account without trying to reduce them to human biology. Since the turn of the twenty-first century there is an increasing tendency to try to base even models that are not mainly neurological in nature on neurophysiological processes. A salient example of this tendency is Peter Levine's attempt to relate his model of fear-potentiated immobility to neurophysiological processes (Levine, 2015). In essence then, all trauma models that want be accepted by contemporary science reduce the hypothesized processes involved to physiological processes occurring in neural networks (Levine's model of fear-potentiated immobility, Shapiro's model based on AIP, Scaer's model of limbic kindling, and Porges' Polyvagal theory⁴⁹) or at least to processes that can be explained from an evolutionary

⁴⁹ Strictly speaking Porges' Polyvagal Theory is not a trauma model. It does *imply* a trauma model however, and it is widely used by trauma therapists and their clients to understand trauma. See Appendix 7 for a brief

perspective (Schauer & Elbert's model and Porges' Polyvagal theory).

In Study 1 of the master part of this project I argued against the prevalent paradigm of materialist reductionism because it is only able to explain purely physical phenomena, not those related to living, conscious, and/or self-conscious beings. I argued that understanding the core phenomena associated with life, consciousness and self-consciousness requires the principle of *agency*, which overrides the principles of chance and thermodynamic equilibrium that are thought to govern the purely physical domain and also underly evolution-based theories. I furthermore argued that the principle of agency can be hierarchically subdivided into three levels, which correspond to the respective domains of *embodied life*, *embodied consciousness*, and *embodied self-consciousness* (de Wit, 2019). In de Wit et al. (2019) and in Study 1 of this thesis I argued against the contemporary tendency to equate cognitive processing of traumatic experiences and cognition in general (respectively) with physiological processes occurring in neural networks.

A preliminary trauma model based on blocked somatic and cognitive processing

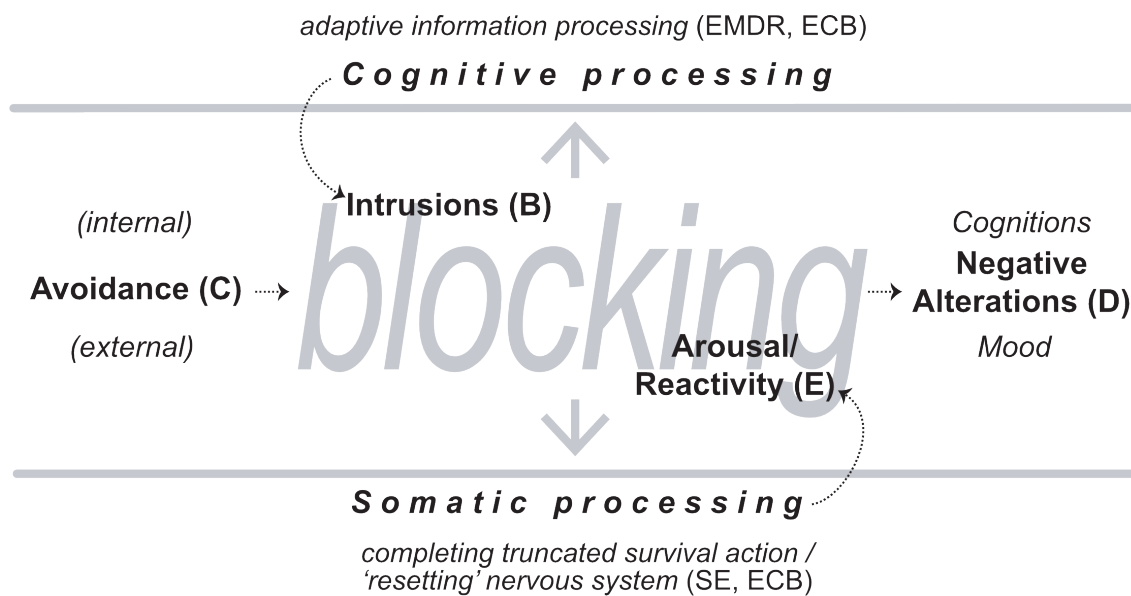
The preliminary trauma model presented in the introductions of the master project and this doctoral project (as well as in de Wit & Cruz, 2020, de Wit et al., 2019, and de Wit et al., 2018) proposed that trauma is the result of blocked processes. Based on clinical observations, these blocked processes were divided into the *somatic processing* of traumatic experiences and the *cognitive processing* of traumatic experiences (see Figure 11, which is identical to Figure 1 in the Introduction and is reproduced here for convenience of reading).

Somatic processing of traumatic experiences refers to a form of processing that appears to be directly linked to the body. It manifests primarily as shaking and trembling, and can be readily observed in prey animals that have survived a predator attack (Levine, 2010, 1997). Humans that have just survived a life threatening situation also tend to manifest this phenomenon (Berceci, 2008; Levine, 2010, 1997). However, it appears that humans are able to successfully suppress the shaking and trembling, presumably due to fear or social conditioning (an episode of strong shaking and trembling is interpreted as weakness and therefore considered undesirable or unacceptable and repressed), or due to the administration of sedatives or other medical interventions that immobilize the reaction (Levine, 2010). Following initial suppression, any resurgence of the phenomenon tends to be met with renewed fear- and/or medication-induced suppression. As discussed above, Levine (2010) proposes that this suppression is based on physiological reactions related to the immobility

response and can result in a vicious cycle of *fear-potentiated immobility*. A similar phenomenon of physiological suppression of somatic processing and long-term immobilization has been observed in animals under certain conditions (Ginsburg, 1975; Hofer, 1970).

Figure 11

The Preliminary Trauma Model: Trauma Symptoms are a result of Blocked Processes



Note. Schematic representation of trauma symptoms resulting from blocked natural processes (cognitive and/or somatic processing), using the four main symptom clusters for PTSD in DSM-5 as a reference. Adaptive information processing is the term given by Shapiro to the cognitive processing during EMDR; completing truncated survival actions and resetting the nervous system are concepts used by Levine to explain somatic processing. (Abbreviations: EMDR—Eye Movement Desensitization and Reprocessing; SE—Somatic Experiencing; ECB—Extended Connected Breathing). Copyright 2019 by P. A. J. M. de Wit.

Allowing somatic processing to occur means that the trembling and shaking are no longer suppressed. When allowed to occur, somatic processing results in the completion of truncated survival actions—often in the form of so-called “micromovements” (Levine, 2010), but see also de Wit (2019); de Wit and Cruz (2021); de Wit et al. (2018).

The result of *cognitive processing* of a traumatic memory is that the memory loses its oppressive charge. A cognitive shift appears to occur after which the memory is no longer experienced as unwanted and/or unbearable, and no longer invades consciousness unbidden. When accompanied consciously, this shift tends to occur rather suddenly and is often accompanied by a sense of great relief, and by a pronounced positive shift in self-perception/-appreciation (de Wit, 2016; de Wit, 2019; de Wit & Cruz, 2021; de Wit et al., 2019; Servan-

Schreiber, 2004; Shapiro, 2001, 2002; van der Kolk, 2014). A similar shift tends to mark the end of somatic processing (de Wit, 2016; Levine, 2010), which could imply that somatic and cognitive processing are closely related. Following this cognitive shift the traumatic experience takes its place among other biographical memories. It can now be recalled *voluntarily*. And, although it may still possess a substantial emotional charge, it is no longer experienced as unbearable or overwhelming—see also Study 2.

Shapiro and others have explained cognitive processing of traumatic memories as a process in which the memories are no longer isolated in maladaptive networks, but are assimilated in larger adaptive neural networks. This is referred to as *adaptive information processing* (AIP) (Shapiro, 2001, 2002; Solomon & Shapiro, 2008; and above in this study). Recently Levine has also connected somatic processing with cognitive processes, using similar neurophysiological models (Levine, 2015).

Based on first-person experiences during ECB, we rejected Solomon and Shapiro's neurophysiological, network-based explanation and proposed that cognitive processing occurs on a nonphysical level (de Wit et al., 2019). We proposed that cognitive processing consists of the reevaluation of personal cognitions associated with the trauma experience.

Cognitive processing as experienced during ECB can be conceptualized as a process consisting of three more-or-less distinct phases (de Wit et al., 2019). Initially, once the activated memory is no longer avoided or resisted⁵⁰ and is allowed to “invade” consciousness, one becomes immersed in reexperiencing salient parts of the memory (the immersion phase, Phase 3—see Figure 5 in Study 2 and Appendix 1). This is a spontaneous process, similar to the phenomenon of cognitive intrusions common after traumatic events (e.g. in the form of flashbacks). To enter fully in the immersion phase one has to allow oneself to experience the intruding memory. This may also include no longer resisting physical reactions. During the immersion phase the traumatic event may be reexperienced quite intensely and identification with the past experience is at its highest level. Although one is aware that the event is not really happening in the moment, salient parts of the past experience are accessed on a deep personal level that is quite different from ordinary waking experience. The past experience “opens up”, and thoughts and emotions associated with the event can be accessed at a level that does not occur during ordinary waking life. One can immerse oneself deeply in these thoughts and emotions, and explore them intimately. Gradually, consciousness tends to become more dreamlike and memories meaningfully

⁵⁰ Avoidance and resistance belong to an earlier phase—the defense phase—which may precede the processing phases.

associated with the traumatic event start to emerge (association phase—Phase 5—see Figure 5 in Study 2 and Appendix 1). These memories may be accessed in more detail, in a similar manner as the initial event is accessed. Thus, consciousness may oscillate between the dreamlike associative state and the deeply intimate experience of immersion. Finally, a dramatic shift may occur, the dreamlike state ends and one is fully conscious again as one suddenly becomes able to perceive cognitions related to the traumatic event *objectively*. These cognitions are deeply personal beliefs and (moral) judgements about oneself. One realizes more or less clearly that one has held these beliefs on a mostly preconscious level. The events that are being processed play a key role in the genesis and the consolidation of these beliefs. Once the beliefs are objectified they can be reevaluated (insight/epiphany phase—Phase 6—see Figure 5 in Study 2 and Appendix 1).

It should be noted that the objectivation and reevaluation as described here do not always happen consciously during an ECB session. They still may occur during the session, but while one has drifted out of consciousness. They then emerge into consciousness as sudden insights upon awakening, or shortly after the session. Alternatively, they may require more time—possibly more time spend *asleep*—and they may only gradually dawn on the conscious mind in the days or weeks after the session.

Therapeutic approaches based on *cognitive behavior therapy* (CBT) attempt to achieve such cognitive reevaluations through therapist-induced processes by focusing on conscious beliefs, emotions and related cognitions. This approach is based on the model of cognitive appraisal discussed earlier in this study. During CBT the therapist tries to induce cognitive reevaluation by means of cognitive “exercises” or therapeutic questioning (see e.g. Bufka et al., 2020; Hofmann, 2012). During ECB objectivation and reevaluation occur more or less spontaneously.⁵¹ The reevaluation phase *can* occur consciously and involve a conscious decision, but it can also occur mostly unconsciously and manifest only gradually.

The observation that the key element of cognitive processing (the objectivation and reevaluation of cognitions) can occur unconsciously may be interpreted as evidence for neurophysiological (network) models. After all, a process that has not been observed but that

⁵¹ In fact, during ECB the complete process occurs spontaneously. The traumatic memory that presents itself at the start of the process is usually not deliberately induced, it tends to emerge spontaneously during the session. The immersion and association phases are not intentionally induced either, they also occur spontaneously. However as indicated, the process only occurs when the client lets go of resistance and *allows* the process to unfold. For a detailed description of helpful strategies to deal with resistance see: de Wit, P. A. J. M., Menezes, C. B., Dias de Oliveira, C. A., Costa, R. V. d. L., & Cruz, R. M. (2018). Rebirthing-Breathwork, activation of the autonomic nervous system, and psychophysiological defenses. *Revista Brasileira de Psicoterapia*, 20(2), 29-42. <https://doi.org/10.5935/2318-0404.20180017>

is evidenced by manifest results (changed cognitions), can be explained with *any* fitting theory; and a theory such as Solomon and Shapiro's (Solomon & Shapiro, 2008) explains it quite elegantly based on contemporary cognitive/neurophysiological network theories. However, I believe that the fact that at least part of the process *has* been observed, but *can* also occur *unconsciously* calls for a different interpretation.

I assert that conscious observation of the objectivation and reevaluation of cognitions needs to be taken into account when developing a satisfactory explanation of the cognitive shift. However, before turning to such conscious observations I want to highlight an implication of the observation that the shift can also occur unconsciously. The fact that the process can occur unconsciously and that even when it is observed consciously parts of the process are still difficult to accompany, indicates that it is not an entirely *voluntary* process—at least not from the point of view of normal waking consciousness. It is not voluntary in the sense that using an arm to take a book out of a bookshelf is experienced as voluntary.

It is quite possible to change one's thoughts about certain issues, and changing one's thoughts appears to be a voluntary process. However, closer examination reveals that changing one's thoughts entails more than discarding one set of thoughts and adopting another set, it crucially depends on what one considers to be *true*—in other words, it depends on one's convictions or *beliefs*. For example, when I believe (am convinced of the truth) that the Earth is a globe, I can't simply "voluntarily" adopt another set of thoughts and from now on believe that the Earth is flat.⁵² To accept the proposition that the Earth is flat on a long-term basis, something *beyond* the idea (the thought) itself needs to convince me of its truth. The same is true for beliefs or convictions about oneself.

Generally *evidence I trust*, or an *authority I trust* are able to convince me of an idea I did not believe to be true before. The ease with which I allow evidence or an authority to sway my beliefs depends on the level of critical thinking I am able (and willing) to involve in the issue. It furthermore depends on the value I have invested in the beliefs that are being

⁵² The words "from now on" are crucial in this sentence, because—as Gilbert (1991) and Farnell (2013) have shown—the mere *consideration* of the idea that the Earth is flat requires me to *believe* it for an instant. Only after believing it can I reject it as untrue (because it is out of accord with what I consider to be true on a more consistent, long-term level—my long-term conviction being that the Earth is a globe). The *thinking* of an idea requires us to temporarily believe it to be true, otherwise it cannot be properly thought and remains incomprehensible. We can only reject an idea as false if we comprehend it first. Only when we comprehend an idea can we critically investigate it and compare it with other ideas we comprehend. Thus, when I am confronted with the idea "the Earth is flat", I must believe it for an instant in order to understand its meaning, and only once I understand its meaning can I compare it to what I believe to be true about the shape of the Earth (that it is a globe). See: Gilbert, D. T. (1991). How Mental Systems Believe. *American Psychologist*, 46(2), 107-119, and Farnell, D. (2013). How Belief Works. *Think*, 35(12), 39-60. <https://doi.org/10.1017/S1477175613000171> .

challenged and the value I attribute to the new beliefs.

Once an idea or hypothesis is considered true, it is no longer treated as a thought or hypothesis which can be questioned, it becomes a conviction, a belief. It becomes *the truth*. A belief is not considered an idea, it is considered *reality*. Reality—the truth—by definition *cannot* be erroneous. This is the nature of a belief, *we* feel literally threatened when our beliefs are questioned. They are our truth, our reality. They are (or have become) part of our identity. To question them means to question our identity, our self. And this is even more true for beliefs about ourself. An idea can only be judged erroneous when it is not—or once it is no longer—equated with the truth; that is, when it is not—or no longer—*believed*.

The negative cognitions associated with traumatic experiences are beliefs about the self. Traumatized individuals consider them true/real. These beliefs have become an integral part of their identity and of their reality. During the traumatizing experience (or shortly thereafter) the individual judges themselves according to their experience: “I am unable”, “I can’t do it”, “I am unworthy”, “I have failed”, “I am bad”, etc. These judgements are directly related to real and very powerful experiences during the traumatic event and also relate directly to the individual’s experience of themselves. They are thus perceived as reality and, since they are self-referring they are perceived as part of the individual’s own identity.

Due to the impact of the traumatic experience compared to previous, non-traumatic experiences, these judgements may be strong enough to replace previous, more positive self-appraisals. Alternatively, they may confirm and consolidate previous negative self-appraisals. Questioning such negative beliefs requires more than reasoning. Questioning them requires directly understanding their *nature* (that they are judgements, i.e. thoughts/concepts, *not* reality) and their *origin* (the traumatic event during which they presented the truth/the reality of the situation).

Directly understanding the nature of a trauma-related belief, means that the *thought* (the idea) inherent in the belief is recognized *as* a thought and no longer (completely) identified with and considered *reality* (true). This is exactly what happens in the insight/epiphany phase of processing during an ECB session. Experience is flipped around as it were—inverted—and the self-judging belief is suddenly experienced *objectively*, as from the outside. The negative thought is recognized as a *thought* and its origin is linked to the traumatic experience (which has been deeply reexperienced in the previous phases). Recognizing the belief as a thought empowers the client to question it and allow a more positive self-appraisal to take its place.

This is a valid way of interpreting the experiences during Phase 6 of an ECB session,

but it is not complete. It is not complete, because it makes it appear as if the final part of reevaluation—replacing the negative self-belief with a positive cognition—is a voluntary act. When the process occurs fully conscious, as assumed in the description above, the *decision* to replace the objectified negative belief does appear to be voluntary—at least *formally*. However, the *choice* of the positive cognition that replaces the negative belief is *not* voluntary. The positive cognition that takes the place of the negative belief emerges from within as an intuition. It is not a deliberate choice made by the individual undergoing the ECB session—they do not choose to replace the negative idea with *any* (arbitrary) better, more positive idea. As soon as the individual becomes conscious of the positive cognition replacing the negative one, they realize this positive cognition is *true*. In other words, they don't “surgically” cut out a negative cognition and replace it with a positive one and then try to convince themselves the positive cognition is “truer” than the negative one they believed before. They *know* the positive cognition to be true as soon as they become conscious of it.⁵³

Another way of explaining this final part of the reevaluation is that the objectivation of the negative belief exposes the belief as *untrue*, as *false* and not reflective of one's real self. The decision to replace it is therefore not really a voluntary act, it is *implicit* in the unmasking of the negative belief. It can perhaps be better described as a letting go of a lie (or falsehood) and an allowing of the truth to reveal itself. In other words, the positive cognition that replaces the false belief was already there. It was obscured by the false negative belief. It is now *re-cognized*, remembered as something which was known all along. This is why the moment of insight or epiphany is often accompanied by such an overwhelming sense of relief. One's memory of one's deeper self (re-)emerges.

This interpretation of the final stage of the reevaluation process can also account for *unconscious* processing during and after ECB sessions. Unconscious processing can be inferred from cognitive shifts for which there is no memory of the underlying process. They can simply be interpreted as follows: the negative belief has been released, and the positive cognition has re-emerged to take its place. Conscious objectivation and evaluation of the negative belief are not required. This can also serve as a valid interpretation of cognitive shifts resulting from EMDR. As mentioned in de Wit et al. (2019), reports from EMDR sessions mostly refer to experiences reminiscent of Phases 3 and 5 (as well as Phase 1, which is not considered here). Reported experiences reminiscent of Phase 6 mention the cognitive shift, but generally don't provide details of the process itself (see e.g. Servan-Schreiber,

⁵³ Note however: even though they know the positive cognition to be true, they may *resist* it!

2004; van der Kolk, 2014)—this was also confirmed in Study 2.

The repercussion of this interpretation of the reevaluation stage is that not only trustworthy evidence or trustworthy authority can convince me of the falsehood or veracity of an idea. Particularly when it concerns *self*-cognition I am able to know the truth or falsehood of an idea *directly*. Direct knowing is the essence of an *insight* or an *epiphany*, hence the choice to label Phase 6 as “insight/epiphany phase”.

Based on these interpretations I propose that when, during or after a traumatic experience, previous self-appraisals are overridden by powerful negative judgements, self-knowledge can become permanently hijacked by such judgements. Self-knowledge will remain hostage to these judgements until they have been reevaluated in the light of a deeper knowledge of oneself. Before the traumatic event this deeper knowledge is generally not accessed at a conscious level. However, since previous, perhaps more naive self-appraisals have been permanently overridden by the negative judgements resulting from the trauma, only this subconscious self-knowledge is now able to overthrow these powerful negative beliefs. In order to access this deeper knowledge, the negative beliefs associated with the traumatic experience first have to be acknowledged and objectified. These judgements can only be recognized for what they are when their genesis during the traumatic experience is recognized and accepted. The process described here is identical to the process described by Steiner as the act of cognition, described in Study 1. The negative belief is a *given* as long as it is *believed*. Once it is being *perceived*, it becomes an object of observation and, as such, it poses a *question*. Thinking first brings forth the understanding that this idea is a *belief* about the self. And since the self *itself* has now become a question it also brings forth the *idea* of the self. Like all other ideas that belong to reality, the idea of the self is no mental construct. Thinking directly accesses (intuits) the *reality* of the self, which surpasses any *presentation*⁵⁴ of the self. It directly accesses the reality of the self and, in answer to the question, it brings it forth as an *experience* of the reality (communion).

Cognitive intrusions can be interpreted as attempts to access the traumatic experience, in order to *understand* it.⁵⁵ The most important part to be understood is the impact the experience has had on self-knowledge. The genesis of self-judgements that strongly deviate from deeper self-knowledge is the most important impact to be understood. Once this impact

⁵⁴ See Study 1, where I justify the use of the term “presentation” instead of “representation”.

⁵⁵ This is one interpretation—the interpretation forwarded at the start of this research. In Study 2 I have also proposed that cognitive intrusions can be interpreted as impressions that are stronger than, or overwhelm the self. Processing of these impressions requires the self to engage with them so that they can be observed, questioned, and understood (in an act of cognition).

and the nature of the judgements is adequately acknowledged and thereby objectified, the deeper self-knowledge can emerge to correct cognition.

This deeper self-knowledge intuited by thinking is the intelligent healing faculty mentioned in the introduction of this thesis. I propose therefore that thinking (as understood by Steiner—see Study 1) is the driver of the self-regulatory capacity that allows human beings to overcome traumatic experiences. The cognitive processing of traumatic experiences can significantly increase an individual's consciousness of this deeper self-knowledge. During ECB sessions (as well as during other types of breathwork, or for example during the use of ayahuasca (Grof, 1988; Grof & Grof, 2010; Harris, 2017; Nielson & Megler, 2014; Shanon, 2014; van der Kolk et al., 2023)) this deeper knowledge is more consciously accessed during Phase 7, the transliminal phase. During other forms of trauma treatment this Phase is usually not experienced consciously.

Diagnostic criteria and the phenomenological exploration of psychological trauma

With the acceptance in 1980 of *Posttraumatic Stress Disorder* (PTSD) as a diagnosis in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) (American Psychiatric Association, 1980), a pragmatic shift occurred in the conceptualization of psychological trauma: the DSM does not theorize or model mental disorders, it merely provides clinical criteria on how a disorder (a group of clinical phenomena) can be *diagnosed*. The DSM endeavors to list the present consensus on which symptoms and symptom groups represent evidence for a specific mental disorder.

Once again, it does so without engaging in theories about how or why these symptoms arise. The symptoms and symptom groups listed in the DSM result from thorough consultations and lengthy discussions with clinicians and other experts in the field. In other words, they are primarily distilled from clinical evidence. During the past decades, much effort has gone into establishing, validating and refining diagnostic constructs for disorders related to psychological trauma. In the latest edition of the manual (DSM-5), five disorders explicitly list exposure to a traumatic or stressful event as a diagnostic criterion. These five disorders are: reactive attachment disorder, disinhibited social engagement disorder, posttraumatic stress disorder (PTSD), acute stress disorder (ASD), and adjustment disorder. Because of their trauma/stress-related etiology they are grouped in a larger category of disorders: *trauma- and stressor-related disorders*. The first two disorders occur during infancy and early childhood, after (severe) social neglect (the traumatic event). PTSD, ASD and adjustment disorder have similar symptom groups, but for a PTSD diagnosis the symptoms require a duration of more than one month, while in ASD they are restricted to a

duration of 3 days to 1 month, immediately following the traumatic event. Adjustment disorder differs from PTSD (and ASD) in that *either* it does not meet the symptom threshold for one or more of the symptom groups, *or* it occurs after an identified stressful event which does not qualify as a traumatic event for PTSD (or ASD) (American Psychiatric Association, 2013).

For a PTSD diagnosis, only exposure to actual or threatened death, serious injury, or sexual violence counts as a traumatic event (such exposure fulfills diagnostic criterion A). The exposure may have been in the form of: 1) directly experiencing it; 2) directly witnessing it occurring to others; 3) learning that it occurred to close others (in case of actual or threatened death, it must have been violent or accidental); 4) repeated or extreme exposure to aversive details of traumatic events (e.g. work-related) (American Psychiatric Association, 2013).

Apart from exposure to a traumatic event (diagnostic criterion A), DSM-5 lists four symptom groups for PTSD (diagnostic criteria B–E). These are (see also Figure 1 & 23):

1. *Intrusions* in the form of: memories, dreams, or flashbacks directly related to the traumatic event, or psychological distress or physiological reactions to internal or external reminders of the event (diagnostic criterion B);
2. *Avoidance* (or attempted avoidance) of: memories, thoughts, or feelings related to the traumatic event, or of external reminders that arouse such memories, thoughts, or feelings (diagnostic criterion C);
3. *Negative alterations in cognitions and mood* associated with the traumatic event (i.e. beginning or worsening after the event): the inability to remember important aspects of the event, persistent negative beliefs, persistent distorted cognitions about the event (its cause/consequences) resulting in blame, persistent negative emotional states, diminished interest/participation in significant activities, detachment/estrangement from others, a persistent inability to experience positive emotions (diagnostic criterion D);
4. *Marked alterations in arousal and reactivity* associated with the traumatic event: irritable behavior/angry outbursts, reckless/self-destructive behavior, hypervigilance, an enhanced startle response, problems to concentrate, disturbance of sleep (diagnostic criterion E).

For a positive PTSD diagnosis an individual is required to experience at least 1 intrusion symptom, 1 avoidance symptom, 2 symptoms from criterion D, and 2 symptoms from criterion E—all with a duration of more than 1 month (which is diagnostic criterion F).

Furthermore, the symptoms must cause clinically significant distress, or impairment in social or occupational (or other important) functioning (diagnostic criterion G), and must not be attributable to the physiological effects of the use of a substance or of another medical condition (diagnostic criterion H). In addition the individual may suffer from dissociative symptoms (depersonalization, derealization) and the symptoms may occur with delayed expression (i.e. the full symptoms do not occur until at least 6 months after the traumatic event) (American Psychiatric Association, 2013).

Since the emergence of the first trauma models in the nineteenth century, being diagnosed with a traumatic disorder has been crucial for being rewarded monetary compensations (e.g. in court claims against railway companies) and receiving treatment. This is still the case, and this is one of the main functions of the diagnostic criteria for PTSD in DSM-5 and ICD-11. However, the symptom listings may also be used in a different way. Although the DSM does not refer to underlying models or theories, the symptoms listed for trauma- and stress-related disorders may serve as a guide for the phenomenological exploration of psychological trauma. If an (adult) individual fulfills the diagnostic criteria of either PTSD, ASD, or adjustment disorder we may assume that they suffer from psychological trauma and may explore the exact nature of these symptoms in order to conduct a phenomenological exploration of psychological trauma. And this exploration may use qualitative as well as quantitative evidence (data). In other words, the careful process of reaching a clinical consensus of which symptoms constitute a diagnosis of psychological trauma such as those listed in DSM-5 allows us to use these criteria as a benchmark, or a baseline from which to conduct further research.

The challenge of finding a unified explanation for the full range of psychological trauma

Psychological trauma can be triggered by a wide variety of traumatic and stress-related circumstances. Surviving a life-threatening accident, listening to the horrifying details of a clients' account of their traumatic experiences, having been sexually abused as a child, losing a spouse, witnessing extreme violence, killing another human being—even remotely, by means of an unmanned aerial vehicle (UAV, commonly better known as a drone), these are just a few examples of experiences that can lead to symptoms that justify a diagnosis of PTSD, ASD, or adjustment disorder, but they indicate the range of experiences that need to be taken into account when developing a comprehensive trauma model.

Levine's model of fear-potentiated immobility, based on ethological observations of prey animals surviving a predator attack (Levine, 2010, 1997), can explain trauma resulting

from *direct* involvement in life-threatening or violent situations, but becomes seriously stretched when trying to explain secondary trauma or moral injury.

Cognitive trauma models based on physiological processes occurring in neural networks such as the one proposed by Solomon and Shapiro (2008) and Stickgold (2002) are less successful in explaining somatic symptoms, are ontologically challenged (de Wit, 2019), and do not take account of detailed reports of conscious processing during ECB (de Wit et al., 2019; and the penultimate section).

The preliminary model presented in de Wit (2019); de Wit and Cruz (2021); de Wit et al. (2019); de Wit et al. (2018); as well as in the general introduction to this thesis and in this study has served as a working model. It is now time to present and elaborate the final model that can explain the full range of traumatic disorders resulting both from direct and secondary experiences. Does psychological trauma result from the blocking or suppression of somatic and cognitive processing? What are somatic and cognitive processing? Traumatic disorders involve the experience of both somatic *and* cognitive symptoms. They both need to be present at some level to lead to a positive PTSD diagnosis. What do somatic and cognitive processing have in common, seeing that, when they don't occur, they lead to a similar range of symptoms?

Before answering these questions and presenting my theoretical trauma model I need to cover one more subject. To be able to properly explain what I think happens during traumatization I need to describe human development with respect to *embodiment* and *cognitive development*.

Human development

I will start here with describing a very general, and at the same time a rather intimate observation. Looking back at how I relate to the world I perceive and of which I experience myself being a part after completing 60 years of life, and comparing the overall quality of the way I experienced myself in the world at the beginning of my life with the overall quality of the way I now experience myself in the world, a striking difference comes to light. At the beginning of my life, I experienced myself living mostly *directly* in my *perceptions* of the world. Now, at 60, I experience myself living in a world which I almost completely *understand*. In the light of Steiner's idea of cognition—described in Study 1 of this thesis—at the beginning of my life my immediate experience was predominated by *percepts*. I experienced the world as a given in which I was fully immersed, I simply surrendered to this immersion in a given world, and gradually tried to make sense of it. Now, my immediate experience is one of *understanding* the world—everything makes sense. To be sure, I do not

live in a world of concepts, I live in a *cognized* world where percepts are married with concepts and the overall context is transparent and known. Thus, tracing the metamorphosis of my experience of myself in the world over the past 60 years reveals a process which is consistent with Steiner's idea of cognition.

When investigating this metamorphosis in more detail, another, more or less parallel development reveals itself. As I have increasingly come to experience myself in this world of understanding, of thinking, it has gradually replaced the experience of primarily being fully at home in the world *in* my body. My relation to the world has shifted from being primarily an *embodied experience*, to one where I feel more alive in *thinking experience*. In addition, the body has begun to be experienced as less fluidly penetrable as before. Being embodied in the world has become less effortless.

This parallel metamorphosis in the way I experience myself in the world reveals two themes. The first theme is that of *cognition*, and the second theme is *embodiment*. Looking at human development from a broad phenomenological perspective reveals a certain correspondence between these two themes. It also shows that developmentally, embodiment precedes cognition. The trauma model which I have developed and will describe here, is grounded in these two themes in human development. In order to describe the model, I will first have to describe the parallel metamorphosis that can be observed in human embodiment and in the development of cognition from the broad phenomenological perspective I just alluded to.

In addition to this phenomenological perspective I will use some of Rudolf Steiner's ideas about human development as a key to make sense of the observations. Before looking at embodiment and cognition, I want to start with an excerpt from a lecture by Steiner given in the first Goetheanum in Dornach (Switzerland) on May 26, 1922. In this lecture Steiner stressed how much child development initially relies on *mimicking*. This concept of mimicking is central to understanding early human development—particularly with regards to cognition, but, to a lesser degree also with regards to early embodiment. I will present it here first in Steiner's words, so that I can refer to it in what follows:

It has been explained here more than once how the first stage of our life relates to our overall development. Many years ago I already pointed out that, approximately until the time when the human child changes its teeth, it behaves very much like an mimicking being. Although humans are not consciously aware of this process, the child intensely takes part—to a certain extent instinctively—in everything which

happens in its environment; it does so in a similar manner in which, later in life, it takes part in what happens in the outer world through its sense organs.

We have indeed, for example in our eye, a process that, to a certain extent, mimics what happens outwardly—just like a photographic camera mimics what takes place in front of its lens. The human being experiences that what is mimicked in his eyes and thereby obtains knowledge of the outer world. It works in a similar way in the other senses. That this principle of imitation is, to an extent, limited to the periphery of the human being only occurs later. In the little child, the whole body takes part in this mimicking (albeit to a lesser degree than in the senses). The whole body stands in a similar relationship to the environment as later only the senses do. The human prefers to be a mimicking being. It aligns itself inwardly to how the outer world works inside it as it mimics its environment. ...

With the change of teeth the child acquires the ability to take in conceptual information and it no longer behaves only like a sense organ. The child begins to take that what it is being told as its guideline and gradually develops this ability further. Earlier it took that what was being done in its environment as its guideline, now it becomes able to understand what it is being told. This is the reason why authority becomes so important in the period between the changing of teeth and puberty, it becomes normative. The child has to be able to naturally follow or comply with what it is being told. Language itself is still learned through imitation; that what can be expressed in language, that what the adult communicates to the child through words only becomes normative after the change of teeth. And the actual ability to form judgements, where the child—or rather the young man or the young lady—starts to put forward his or her own judgements, starts only with puberty. Only then can we expect the young person to begin to form his own inner judgements. (Steiner, 1998, pp. 11-112; my translation, PdW)

Embodiment

Infancy. Elsewhere I have described in detail what happens when infants take their first breath (de Wit, 2016). For a few minutes the infant still receives oxygen from its mother through the umbilical cord (provided the cord is not immediately clamped and cut), but very soon after birth it needs to breathe on its own. There is however, another big change that occurs soon after birth, perhaps not as immediately obvious as the need to breathe, but equally dramatic: the infant needs to start *digesting* what it ingests. Its lungs weren't used until birth and neither was its digestive system. Having to breathe and digest on our own can

be viewed as the first major steps we make in becoming embodied beings. Although the digestive system starts to work much more gradually than the lungs, the effects are profound. A sensitive person easily notices that during the first day or two following birth “something” shines brightly in and around the new-born. If the birth hasn’t been too traumatic and didn’t involve anesthesia, when the infant is awake during this period, they often appear intensely present and aware. This changes quite dramatically when the digestive system—particularly the bowels—start to work. The bright presence disappears as the infant appears to become immersed (or “dives under”) in the processes related to digestion. Compared to breathing, the digestive process unfolds very gradually. Initially the infant is only able to digest its mother’s milk, or a synthetic equivalent of it. It takes months before the infant becomes able to eat and digest solid foods. The full development of taking hold of the processes of digestion takes years.

Digestion is a very destructive process: everything that is taken in is broken down as far as possible. But digestion is much more complicated, it is much more than the breaking down of food. On a deeper level digestion can also be seen as a *perceptive* and *mimicking* process. And although Steiner doesn’t mention it as such in the extract quoted earlier, the digestive process fits his observations very well. Elsewhere, Steiner as well as scientists that continued his research have described that in the process of breaking down our food the deepest parts of our being *perceive* the higher essence of the food and through this perception we learn how to *form*—or to *create*—the physical form and substance of our own body (see e.g. Hauschka, 2008). If we track our relationship to the food we eat from the moment we first lay eyes on it to the stage when we excrete the broken-down substance, we get a glimpse of the importance of *perception*. The digestive process begins when we *look* at and *smell* the food we are about to eat. When we put the food in our mouth and start to chew and mix it with saliva, we also *taste* the food. The *perception* of the food we consume deepens as it enters our body further. Although we quickly lose awareness of it, the process of breaking down goes hand in hand with perception, and this continues deep inside us, until the food has disclosed *all* its secrets. Through the processes involved in digestion we not only take the food apart, but we literally *take part* in the food we eat (Hauschka, 2008).

Apart from learning to take hold of the processes taking place in digestion, in the first year of its life the infant also learns to take hold of the rest of its body. The infant is born with what are called the *primary reflexes*. These reflexes are general and purely instinctual—they serve the infant’s initial survival. To give an example: two of these primary reflexes are the *rooting reflex* and the *sucking reflex*. These reflexes make the new-born infant “root for” and

suck the milk from its mother's breast. The rooting reflex causes the new-born to move towards its mother's nipples, while the sucking reflex causes it to suck as soon as it takes hold of the nipple. There are several other primary reflexes. Many of them serve to initiate and direct the infant's initial movements. In its first years the infant gradually learns to *inhibit* these reflexes and to use its body more in accordance with its *own* will-impulses (Goddard Blythe, 2014).

Standing upright, walking and moving. Around the end of their first year, most children learn to stand and to walk *independently*. When one observes how a child first stands up, one can perceive that it first needs to keep its head upright and then gradually appears to lift its head upwards, stretching itself into an erect human being. Then, when it has mastered standing upright, it can gradually learn to start moving around on two legs. First with the help of support, and gradually without support. When one, open-mindedly, observes the way in which an infant initially walks, one gets the impression that it almost behaves as if it were a puppet. It is almost as if a puppeteer handles its movements. The "puppeteer" appears to be working from above the child, or from the periphery. The movements do not yet seem to be directed from *within* the child. When a child starts to walk, initially the center from where the young child's movement-impulse appear to originate seems to lie at the level of its head or above it, or even further away, in the periphery. The center doesn't appear to lie near the *center of balance* between the heart and the lower body as it does in adults. As the child develops further, this center gradually seems to descend, as the child grows into and masters its body. In fact, a more accurate description of this metamorphosis would be that the center from which the movement appears to originate moves inwards from the periphery, towards the center of balance, while at the same time the head gradually grows upwards—out of the sphere it appeared to share with the rest of the body. We can start to distinguish a *movement* center (which coincides more or less with the center of digestive processes) and the *head*, and these two gradually grow apart. Thus, as the child develops, the process of embodiment and particularly the process of individualizing its movements can be followed spatially in the way the developing child *carries* and *leads* its body. Initially its movements appear to be directed from the periphery, but gradually they appear as directed from within. Purely by observing the way a child carries and leads its body, it appears that the center from which its movement originates moves from the periphery to the center of the movement pole, while at the same time the head pole moves up and becomes more clearly separated from the movement pole.

Learning skills. Observing the early development of infants and young children attentively—without immediately connecting learned concepts to what one is observing—

one may awaken to the dynamic image of how the human being—as an individualized agent—gradually appears and expresses itself through the body of the child. This appearance goes through specific stages. During the first day or two after birth it is as if the presence of the child expresses itself in the way the child peacefully and attentively *is*. At the same time this presence appears to fill the entire room (and beyond). This changes dramatically after a day or two. The presence disappears, as if it dives under *in* the child. From the manner in which the infant gradually masters movements and ceases to express the primary reflexes, one gets the impression that the initial presence has indeed entered and immersed itself completely into the body, gradually taking hold of it and making it its own.

The process by which we appear to learn new skills can perhaps cast some light on what happens during this initial process of becoming an *embodied agent*. The model which intuitively appears to describe the process of learning new skills quite adequately is the *four stages of competence learning model*, originally developed in the 1970s by Noel Burch for *Gordon Training International* (Adams, 2021). The model describes four stages. With regards to a skill we haven't mastered we are initially *unconsciously incompetent* (we haven't mastered the skill, but we are not aware of our inability to perform the skill). From this first stage we move to being *consciously incompetent*. We realize that we are unable to perform the skill—this means that we are attempting to perform the skill but are unable to do so. We start to practice the skill and eventually become *consciously competent* in performing it—we can perform the skill, but need to pay attention to be able to perform it correctly. Finally, after having performed the skill numerous times, we may awaken to the realization that we are performing the skill without having to pay conscious attention to it—we have become *unconsciously competent*. I have applied this model previously to analyze the process of learning to drive a car (Cruz et al., 2020; de Wit, 2016).

The stages that concern us here are the second and the third stage, the conscious stages. Apart from our intention to perform a new skill, conscious attention is crucial for learning to perform it. *Grounded* in our intention (our intention *is* the performance of the skill—or part of it, if we divide learning the skill in parts), we focus our attention on our performance as we practice performing the skill (or part of it). We use our attention to guide our body into performing the skill, and also to experience (and through this experience to evaluate) the *quality* of our performance. During the stage of conscious incompetence we experience exactly *where* we fail to perform the skill to the required standard. We *perceive* our performance and judge its quality. Our attention provides us with instant feedback. And we keep practicing. We go through this procedure again and again, until we have mastered

it—until we perceive that the quality of our performance of the skill coincides with our intention. Then we *know* that we can perform the skill—we *know* that we “know how”.

Sometimes while observing an infant trying a movement, we may catch a glimpse of the process described here. The infant is looking attentively at an object. The arms flail as they attempt to grasp the object. Initially they fail again and again. Yet the infant remains deeply devoted to the object and to the task it appears to have set itself. After many trials the arms become more steady and appear to move with more intention. Finally the infant grasps the object. The infant may repeat grasping the object many times, every time becoming better at it.⁵⁶

Observing infants practicing intentional movements has led me to the idea that the deeply devoted attention they appear to demonstrate is *essential* in stilling and overcoming unwanted movements and primary reflexes (de Wit & Cruz, 2019; Goddard Blythe, 2014). And I wonder, is there a deep correspondence between Rudolf Steiner’s idea of cognition and the manner in which we learn to use our body intentionally? In learning a new skill, *perceiving* our performance and weighing it against the intended goal appears essential. When we perform the skill as intended, the *perception of the performance* and the *intention* fall together, they are one. In the act of cognition percept and concept find each other and light up as cognition. Is an intention a concept, an idea, but one which wants to be *realized* in an act? In Study 1 I wrote about rare instances in which a percept doesn’t meet the right concept—in such moments we can recognize that the act of cognition *is* an act we perform. Such moments feel very much like *conscious incompetence*. The difference is that cognition *starts* with the percept, to which thinking adds the concept. The performance of a skill or another embodied act, *starts* with the intention and ends in the percept of the realized act. It is almost inverted.

Cognition

Learning to speak. After the child has mastered standing upright and walking, the next milestone in its development is learning to speak. As indicated by Steiner in the excerpt quoted earlier, the child initially masters language through imitation. It *mimics* the language it perceives in its environment. It perceives language—words and sentence constructions—and it tries to *imitate* them.

⁵⁶ A parody of sorts of this process is humorously dramatized in the film *Kill Bill: Volume 1* by Quentin Tarantino when the protagonist (the Bride) has awakened from years of coma and has to relearn to use her legs. She lies in the back of a pickup truck and starts by focuses her full attention at her (right) big toe, commanding herself to “wiggle your big toe”. Tarantino, Q. (2003) *Kill Bill: Volume 1* [Film]. Miramax Films.

A healthy young infant produces sounds soon after it is born. Initially these sounds are mostly related to emotions: when the infant is upset it cries, when it is content it coos, etc. Gradually the repertoire of sounds increases, but the emotional undertone prevails. Soon the child also learns to use the sounds to *communicate* what it wants. Then, around its first birthday the child starts to speak its first few words. It starts to copy the salient words it hears spoken in its environment. At this stage the child sometimes also develops a sub-language; a language which doesn't have real words, but which has melodies and intonations. Again, this sub-language has a clear emotional undertone, but now the emotions are not coming from the child itself, they are mimicked from the environment. A contemporary example is a child mimicking its parents talking and gesturing on their cellphones. The child doesn't mimic the actual *words*, but its gestures and intonations perfectly imitate the gestures and intonations used by its parents and by others in its environment (sometimes to their great embarrassment). Then—first gradually, but soon very rapidly—the child starts to expand its vocabulary of real existing words by imitating them from its environment. Thus, layer upon layer, language is build up by mimicking intonations and by mimicking actual words. Initially most words are related to objects and are mimicked quite consciously. Sometimes one can observe the child studying the mouth of the one it is mimicking and trying to 'mouth' the word that is being spoken.

Gradually the child starts to build simple sentences and to use verbs. When the child starts to use language creatively, i.e. when the child starts to formulate sentences that go beyond mere imitation and when it starts to use language to communicate, it has taken hold of the use of language and speech and can now use them independently as an individual. However, the child first needs to acquire a certain vocabulary and it needs to learn the relationship between intonation and the emotional content of language. Both of these it learns through imitation.

Yet, learning a language is not just based on imitating or mimicking the environment, it is also influenced by something that is not present in the outer environment. Evidence of this impulse can be found in the work of the cognitive scientist and experimental psychologist Steven Pinker (although Pinker himself considers this impulse to be related to processes taking place in the brain). In his book *The Language Instinct* (1995), Pinker argues that language is *not* just learned through mimicking from the environment, but that its acquisition is also governed by a native *instinct*. Pinker builds his claim on several observations and I will briefly present two of the observations he uses in his book—they concern phenomena that show that language is not just learned through mimicking. Pinker's

first observation draws on the work of the linguist Derek Bickerton, who studied the development of *pidgins* and *creoles*. Pidgins are *non-grammatical* forms of language, developed when adult speakers who share no common language learn to communicate with each other. This occurred for instance amongst many first-generation slaves. It was first studied amongst migrant workers in Hawaii at the beginning of the twentieth century. Migrant workers from many parts of the world converged to work in Hawaii's blooming sugar plantations and, to be able to communicate, these migrants developed a pidgin: a non-grammatical common language. Their children however, who grew up amidst this pidgin-speaking community, *spontaneously* developed a full *creole*. A creole is a *fully grammatical* language (developed from a pidgin) that has all the structures and constructions of a proper human language. According to Pinker these children had not been exposed to a proper human language, but nevertheless they developed a fully grammatical language from the pidgin they imitated from their parents (and from the rest of the community). A similar phenomenon has been observed in certain *deaf* children, that is, in deaf children either of hearing parents, or of deaf parents who learned sign-language only later in life. The sign-language these deaf children were initially exposed to and imitated was like a pidgin (it was relatively ungrammatical and it was poorly structured), nevertheless these children themselves spontaneously developed a sign-language that possessed all the grammatical and structural properties of any other proper human language. Obviously these two observations can't be explained by stating that language is learned *only* through imitation. They indicate that there is *another* element involved in language development. Pinker argued that this element reflects a commonly shared structure in the parts of the brain that are involved in language. An alternative explanation would be that the developing young child is in communion with the formative *source* of language—which is not of a physical nature, but lives at the level of ideas—and directly accesses the normative rules inherent in language through this communion (this is, in very generalized terms, more or less what Steiner claims). Once these rules have been intuitively woven into the language the child is learning, this direct connection is lost. Therefore these rules are no longer intuitively accessible to adults, they need to learn to apply them through conscious effort.

Thinking. According to Rudolf Steiner, only once the child has acquired a certain level of language does it become able to *think* (e.g. Gilbert, 2005; Glöckler, 2019; Weber, 2019; Wiehl & Auer, 2020). Just like the creative use of language requires a certain vocabulary and is build on the more basic layer of emotional 'speech' (intonation), learning

to think requires a certain level of language. Thus, contemporary human thinking is build upon language: it uses language as its *vehicle*.

A brief summary of what has been observed and discussed up to this point. In its first year the infant needs to come to terms with the forces at work in its body (especially in its digestion and with regards to the instinctive reflexes it is born with) as well as with the force of gravity. It learns to inhibit the innate primary reflexes and gradually gains control over its body, it learns to use its body in its own individual way. This leads to learning to stand up and to walk—first as if being moved from the periphery, but gradually the center from which movement appears to originate moves to within its body. Next the young child starts to acquire language and learns to speak—it first mimics the language in its environment and then individualizes it. And finally it learns to think. Only when these three developmental goals are achieved does the child acquire *self-consciousness*.

Self-consciousness. Initially, after learning to speak, the child still refers to itself in the *third* person—it still has no clear concept of *subject*, but refers to itself more objectively. Its *cognitive* world appears to be largely a mirror of what it perceives in its environment. As the infant starts to become able to express its first individual intentions, the reactions it receives from its environment start to *interfere* with the way it manifests its intentions. As a result the infant learns to *modify* the way in which it expresses its intentions—based on the reactions from the environment. Not only do its own intentions meet resistance or encouragement from the environment, but the encounter with its environment also generates *new* intentions and has a strong influence on the child's *desires*.

By the time the child learns to use language it has become more conscious in its interaction with its environment and when it starts to think, its *inner* sense of consciousness is becoming stronger. Then, during its third year the child suddenly starts to refer to itself as “I”. It no longer speaks of itself in the third person. From the perspective developed by Steiner, this indicates that the child's I starts to light up its *inner* world. The I is the *source* of the child's unfolding agency. Until then, it has worked invisibly in the child in the developing child. Steiner sees it as the force that takes hold of and shapes digestion, that transforms the primary reflexes into intentional movements, and that drives the body's uprightness, as well as language development and thinking (Weber, 2019). As it starts to refer to itself as “I”, the child becomes self-conscious and begins to experience itself as a subject. From this moment on the child is able to form what we call autobiographical memories: it acquires a sense of *continuity of self*. The child starts to identify itself with these memories.

The development of thinking: believing precedes critical thinking. After the child can refer to itself as “I”, its inner world starts to blossom. The child now gradually develops a very rich and active *imagination*. Then, with the change of teeth, the child starts to become able to use its thinking in a more *conceptual* way (e.g. Gilbert, 2005; Mitchell, 2015; Weber, 2019). It can now start to learn to read and write and it can learn the basics of algebra. But—as for instance also Piaget has pointed out—until puberty learning is still very closely tied up with concepts related to *concrete experiences*. In Waldorf education (developed on the basis of Steiner’s indications) conceptual content is only gradually consolidated and developed by using the child’s imaginative thinking and embodiment. For example, the letters are developed from images. The “K” is first a king in a story and only gradually becomes abstracted into a letter. Numbers are developed by recognizing amounts in the world. And mathematical manipulations are developed from manipulating amounts of objects in the world. They are also embodied in the form of rhythms, as clapping, stamping etc. before they gradually become abstract number manipulations (Gilbert, 2005; Wiehl & Auer, 2020). As we saw in the excerpt from Steiner’s lecture, at this stage the child can grasp the *content* communicated to it in language, but *only* when the content relates to *concrete* experiences and *practical concepts*. The child is not yet able to grasp completely *abstract* thoughts. Before the change of teeth, the child lives much more in the *images* contained in language (a good example are the images contained in fairy tales), with the change of teeth it becomes more focused on the practical concepts conveyed through language (Mitchell, 2015). Between the changing of teeth and puberty the child is drawn to what is *true* in the world (Glöckler, 2019), however, it greatly depends on the loving authority of the adults in its environment to point it in the direction of what is true. It believes what it is told, and has not yet developed the capacity to investigate the veracity of these concepts critically.

Until the change of teeth the child *implicitly believes* what it experiences and perceives. Actually the word “believing” is too weak to express the right relationship of the child with its environment: the child literally *mimics* and *builds itself up* out of its perceptions of its environment and only once it has acquired this mimicked ‘substance’ can it start to “work” on and with it in a more individualized manner. After the change of teeth the child believes what it is told by those it regards as authorities. Only around the time when the young person reaches puberty does he or she *truly* become capable of *abstract* thinking and—as we saw above in Steiner’s words—of forming their own *judgements*. Until then the child accepts the thoughts it is given on authority.

Thus, a brief exploration of childhood development confirms what psychological experiments (Gilbert, 1991, 1992; Gilbert et al., 1993) and logical analysis (Farnell, 2013) appear to indicate: critical thinking is built on and preceded by the ability to *mimic* and to *believe*. The ability to think critically reflects fully individualized thinking. The self has now fully entered into the act of cognition. Thinking goes through the same individualizing development as speech, movement and digestion.

As indicated, *self-consciousness* only begins to manifest when we are two or three years old. *Before* we become fully self-conscious we are merely *conscious*—although there may be a vague sense of self. In the earliest stages of our embodied life we do not have a clear experience of our *own subject*, we are immersed in our experiences with a dreamy kind of awareness—this applies to inner as well as to outer experiences (and there is no clear distinction). We are immersed in the *experience* of impulses, feelings, perceptions, thoughts, but *without* a clear inner center of our own, without a clear sense of *self*. We are not yet *awake* to our self. This experience is very much like the experience of the *immediately given* that Steiner arrived at when he suspended all cognition in order to be able to identify the starting point of cognition. It is also reflected in Donna Williams’ writings about “the sensory”—see Study 1.

In these first two to three years of our lives we develop faster than in any other period of our lives, but this development is largely *unconscious* and rests on the perception and imitation of what is around us. Consciousness and especially *self-consciousness* require a foundation. Before we become self-conscious, we deeply mimic aspects of the material, the emotional and the social field of our environment, and in particular we mimic the language in which we are immersed. Later our individuality transmutes the inner “substance” it has acquired through mimicking and uses it to *express* itself and for a part also to become conscious of itself.

Initially our *thinking* is equal to believing. Our thoughts mimic or mirror our environment, including our *mental* environment. More individualized levels of thinking depend on the ability to step back from this *mirrored* world of thoughts, to observe it and to investigate it critically. Only when we are able to make this mirrored world of thoughts truly our own, do we become able to think as individuals. This process of taking a step back from the thoughts we have mimicked and to critically judge them before we decide to accept or reject them resembles the process of breaking down our food and the inhibition of primary reflexes that we have encountered in different aspects of our embodiment.

Thus in all these aspects of human development we can recognize a strong intentional force. A force that strives to *individualize* the “substance” it has acquired or taken hold of. A force that strives to make this substance its own and use it to express itself. This substance can be nutrition, the body and its movement reflexes, words and the emotional undertones of speech, or concepts and ideas received during formal or informal learning, (or, ideas formed to make sense of personal experiences—i.e. self-referring concepts or self-beliefs). As indicated above, Steiner refers to this force as the human “I”. In the master’s dissertation that preceded this thesis I approached this force through the concept of *agency* (de Wit, 2019). When the I has successfully transmuted the different “substances” discussed here and can express itself through them *at will*, it has become an autonomous embodied and cognizing agent.

Somatic processing and cognitive processing of traumatic experiences

When looking at somatic and cognitive processing of traumatic experiences from the perspective of human embodiment and cognitive development described in the previous sections, everything suddenly falls into place. Both forms of trauma processing can be understood by looking at the development of human embodiment and cognition.

Somatic processing: re-embodiment facilitated by perception. Peter Levine developed the model of fear-potentiated immobility in an attempt to understand how trauma arises. He gradually developed this model as he was involved in the treatment of clients with traumatic disorder. He developed a method of treating trauma-related symptoms, which is known as *Somatic Experiencing* (SE). In his description of SE Levine stresses the importance of developing and guiding the client’s capacity for *interoception*—their ability to perceive what is happening in their body—and *proprioception*—their ability to perceive their movements from within (Levine, 2010, 1997; Payne et al., 2015). From a basis of perceiving how it feels to be safe in their body, the client is gradually guided to get in touch with unresolved feeling states and movement-impulses related to their traumatic experience. Earlier in this study I have described that Levine understands these movement-impulses as remnants of mobilized survival energy and truncated survival movements that want to be expressed, and the feeling states (fear, helplessness and hopelessness) as a reaction to these impulses. The unresolved movement impulses are comparable to the primary reflexes and the flailing movements of the body of a young infant, and, to a lesser degree also to the untrained body, unable to perform a skill. To the self they are foreign impulses, not *intentional* impulses. They are unwanted. Just like—in a way—the flailing movements and the untrained movements are not what is wanted. Yet, if the child (or adult learning a skill) is to master

their movements these movements need to be engaged with and perceived from within. Only then can the child (or the adult) attune the performance of their body to the intended performance and thereby make the movements their own. Likewise, the interoceptive approach used in SE teaches the client to *enter* into the unresolved trauma-related impulses (to *allow* them—see also de Wit et al., 2018). Only by thus entering in these unwanted impulses and allowing them to be released, does the client make their body their own again. The interoceptive approach helps the client to regain embodied agency. The reason why it is important to first establish a safe basis—to find a space in the body that feels safe interoceptively—is that the impulses are not just unwanted, they are resisted. The client doesn't *want* to enter into them. Moving from a safe basis helps the client to trust their capacity for embodiment. They know where they are already embodied, and from there learn to gradually “embody” the unwanted parts.

Thus, just like in the original process of embodiment, SE helps the client to regain embodied agency by perceiving (interoception and proprioception) the internal state of their body. This perception is the door for the I to gain (or regain) full access to the body and its movements (embodiment) and to use it to express itself (embodied agency).

Cognitive processing. Stickgold (2002) proposes that the symptom of cognitive intrusions can be understood as episodic memories that are not consolidated into the *semantic memory system* and that continue to be replayed (see above). To me the quality of the *experience* of these intrusions reveals something else. Their experiential quality is similar to what Steiner referred to as the *immediately given*, and what Donna Williams called *the sensory*. In fact, it was while reading Williams' accounts of her experience of “the sensory” that I was struck by the similarity of her descriptions with descriptions of the intrusions experienced by those suffering from so-called traumatic disorders. It is not just the brutal *directness* of the experience—which is beautifully described by Williams, but doesn't appear in Steiner's descriptions—it is especially the almost complete lack of conceptual content in the descriptions that made me realize that intrusions are pure sense experiences, devoid of concepts. Intrusions reveal an almost complete *absence* of the act of cognition as described by Steiner. Therefore, the first step in cognitive *processing* of traumatic memories is almost identical to what has been described about somatic processing in the previous subsection. It entails a process of (cognitively) engaging with the experience. This means allowing the experience to arise and to *perceive* it consciously. It means allowing *thinking* to engage with it and placing it within the context of previous experiences and previously acquired knowledge. It means *understanding* the experience as explained in Study 1. Understanding

not in the superficial sense, but relating it to all aspects of one's being—I have called the core of this act *communion* in Study 1.

This process engenders secondary acts of cognition that I have described in reasonable detail above in the section “A preliminary trauma model based on blocked somatic and cognitive processing”. These secondary acts of cognition are acts of cognition unfolding upon previous cognitions. Above I have described these previous cognitions as self-beliefs that have been formed or reinforced due to the traumatic experience. As the understanding of the traumatic experience deepens, these beliefs are *perceived* (and recognized *as* beliefs). Once such self-beliefs are perceived for what they are, thinking engages and—in response to the perceptions—it brings up deep intuitions that appear to come directly from the spiritual essence of the I. These intuitions challenge the limiting self-beliefs that were brought forth because of, or reinforced by the trauma (see also de Wit, 2019; de Wit & Cruz, 2021; de Wit et al., 2019; and Study 2 of this thesis).

Basically then, the cognitive processing of traumatic experiences and memories results in restoring and often enhancing cognitive agency, in a similar way in which somatic processing results in restoring (and often improving) embodied agency.

Trauma: the loss of embodied and cognitive agency

Understanding somatic and cognitive processing of traumatic experiences as restoring embodied and cognitive *agency*, paves the way to understanding what happens when a person becomes traumatized. The occurrence experienced as traumatic affects their embodied agency, their cognitive agency, or both.

Building on Levine's ideas about truncated survival reactions, I assert that a person's embodied agency becomes affected when the traumatic event triggers a survival reaction (flight or fight) which can't be completed due to tonic immobility, or when it triggers an advanced stage of immobility (flaccid immobility or loss of consciousness). This may also occur as a consequence of anesthesia, or may be enhanced by it.

When an *embodiment* stage of the defense-dissociation sequence is activated (particularly flight or fight—see Figure 10), and is not blocked from execution, embodied agency is usually not affected. When the action is blocked, its intention is not fulfilled. Such an intention doesn't dissipate easily, especially since it was very powerful and motivated by survival. Even though the person survived, this unfulfilled intention is perceived as a failed attempt. In order to affirm full embodied agency the intention needs fulfillment. This is similar to the experience inherent in conscious incompetence, either the person accepts incompetence, or they practice until able to perform a skill in the intended way. In the case of

an uncompleted survival action, accepting incompetence leaves the person with a “hole” in their existential experience of agency. This “hole” leads to disabling self-beliefs (“I am unable”, “I can’t do it”, etc.). Such beliefs are the result of perceiving the inability to complete the survival action. The disabling self-concept belongs to the perceived inability. Thinking will intuit the disabling self-concept as the conceptual content of the perception of the inability to complete the survival action, or of the inability to act at all as in the experience of tonic immobility. The feeling state described as “helplessness” belongs to this perception of the inability to perform a survival action.

In my opinion, symptoms belonging to the symptom cluster of *marked alterations in arousal and reactivity*—diagnostic criterion E for PTSD in DSM-5 (American Psychiatric Association, 2013)—can be (at least partly) interpreted as the blocked and unfulfilled intention seeking completion. When such symptoms are engaged in they tend to lead to restoration of embodied agency and also to a restoration of cognitive agency related to the negative self-cognitions associated with the unfulfilled intention—an example of this was given in the clinical study for my master’s project (de Wit, 2019; de Wit & Cruz, 2021).

When a *dissociation* stage of the defense-dissociation sequence was activated, the resulting “hole” in embodied agency tends to be more substantial and more difficult to repair. The person may have been confronted with immanent death, but survived. This may lead to negative self-beliefs at an existential level (“I shouldn’t live”, “I don’t deserve to live”). The feeling state of “hopelessness” belongs to this perception, as does the associated state of (clinical) depression. When the person lost consciousness during the dissociation this may lead to a difficulty to “stay with something” and can impair conscious cognitive functioning. As indicated in de Wit et al. (2018), in this case the required therapeutic approach is one that stimulates embodiment. Only when the tendency to dissociate is reduced is progress possible.

Intrusions (the symptom cluster belonging to diagnostic criterion B for PTSD in DSM-5) are predominantly “impressions” that have not undergone, or that have not completed cognitive processing (the act of cognition). Either thinking (in the sense discussed in Study 1) has not yet engaged with these impressions, or thinking has not completed the process of bringing forth the adequate conceptual content to make sense of them. This process of bringing forth the adequate conceptual content can have many different levels. The “impressions” can be *sense impressions* and related feelings associated with a traumatic event—either one that the person was subjected to themselves, or one they witnessed somebody else being subjected to. The associated feelings are always their own. The “impressions” can also be of another nature. They can consist of graphic images, feelings, or thoughts conjured

up by the person themselves, while hearing others talk about traumatic experiences. They may also involve images from movies, particularly when the person fully empathized with what happened in the movie, or hasn't matured to the stage where they can sufficiently distance themselves mentally from such images.⁵⁷ In addition, particularly more contemporary movies can invoke psychophysiological reactions similar to those belonging to the defense-dissociation sequence. Experiencing such scenes while sitting passively in a chair is comparable to a mild form of (hypnotic⁵⁸) immobility.

All intrusions also contain high levels of emotion, but especially in traumatic grief the feeling of devastating loss itself is the core of the "impressions".

The "impressions" can also be of a conceptual nature. Child sexual abusers for instance, are known to manipulate their victim's perception of the abuse by carefully constructing a conceptual context which makes it appear as if the abuse is not abusive, and which makes the victim believe that they want what is happening. Mathias Wais and Ingrid Gallé have written an excellent book about this subject (Wais & Gallé, 2008). The carefully constructed web of lies the perpetrator of the abuse has spread around the victim (and often also around the extended social environment of the victim), results in a general cognitive context in which it is very hard for the victim to discern what is real and what is a lie as they grow up. As the victim was at an early age—an age in which their cognitive development had not yet reached the stage in which they could separate themselves from what they were made to believe and engage critically with it—they generally accepted the web of lies. In later years these concepts rise up as a "given" and need to be carefully engaged in, in order to discern truth from lie and in order to be able to perceive more "objectively" what they have experienced. Thus, in such situations the "impressions" are often a mix of conceptual contexts and lived experiences.

In moral injury (perpetrator trauma) the "impressions" consist of the client's own deeds (killing someone, raping someone etc.). In addition, the perpetrator's own moral judgements also rise up as impressions that need to be engaged in in order to restore cognitive agency. This requires perhaps the deepest level of cognitive processing a human being is capable of: facing and engaging with one's own moral judgments about one's own

⁵⁷ I vividly remember watching a movie based on a famous Dutch book in which German soldiers befriended and then raped a teenage girl during the occupation of the Netherlands in WWII. I was approximately 13 years old at the time and it took days until the images and emotional upheaval I experienced gradually receded after I allowed the scene to replay time and time again in my mind. All the while I was trying to "wrap my thinking around" what was happening in the scene.

⁵⁸ At the early stages of the scientific research of immobility in animals such immobility was referred to as "animal hypnosis".

deeds. In this case, cognitive agency can only be restored when the person reaches a sufficiently deep level of genuine (self-)forgiveness.

In all these cases the trauma-related symptoms can be understood from the perspective of a *loss* of agency. The concept of *blocking*, which was central to the preliminary trauma model, can thus be dropped—and with it the conundrum of *intentionality* that has plagued trauma models since the late 19th century (see the polarity concerning the cause of trauma, discussed in the subsection “Freud’s purely psychological explanation of trauma” above; as well as van der Kolk et al., 2007; and Study 3 of my master’s dissertation, de Wit, 2019). Disturbing events lead to trauma-related symptoms when they negatively affect the embodied and/or cognitive agency of the person subjected to them. The human agent, the I, cannot penetrate what is experienced as traumatic. It is temporarily overwhelmed by the magnitude and the quality of the experience. Either because the experience involves reflex-like survival reactions that override its embodied agency (embodied agency is effectively disabled), or because the experience involves impressions it cannot immediately *comprehend*. As a consequence, embodiment and/or cognitive agency are compromised. The survival reflex (particularly when it inhibits embodying reflexes) and the impressions can be compared to foreign bodies that are not taken hold of by the I—they leave a “hole” in embodied and cognitive agency. As long as the I cannot fully access, penetrate and transform the traumatic experience, trauma symptoms will remain.

For a third person, the reaction to trauma-related impressions of not wanting them (to use a neutral term), and not wanting to *engage* with them can appear to be fully or partly intentional. The traumatized subject mostly doesn’t experience this reaction as intentional. Peter Levine has emphasized the role that fear can play in the relation of the subject with trauma-related impressions. His explanation of trauma as a vicious cycle, based on fear-potentiated immobility, revolves around the idea that trauma-related impressions engender fear and are met with a immobilizing response—either instinctively or more consciously (he does not elaborate on this). In my observation the traumatized subject tends to experience themselves as *unable* to engage with the impulse. The impulse carries a similarly overwhelming load as the original traumatic experience and the subject needs to be supported in such a way that they attain the confidence that they *have* the ability to engage with the impulse. This perceived inability appears to be of the nature of a negative self-belief.

In the case of systematic childhood abuse the cognitive impressions—the web of lies woven around the subject by the perpetrator—have become part of the overall cognitive landscape of the subject. Here the source of intentionality is the perpetrator, and their

intentions appear to work on in the subject (their victim). These cognitions need to be carefully identified before the subject can start to separate themselves from them and can learn to build up a cognitive world that reflects a reality beyond the abuse, free from the foreign intentions of the abuser.

Our innate capacity for self-regulation—the human I

A conclusion

Intrusions and states of high arousal and reactivity indicate areas in our cognitive and embodied life that the I has not accessed, where its agency does not reach. It does not live in these areas, they are estranged from it and lead a life of their own. They are areas that require the I's engagement. They are unresolved issues that keep emerging until the I has appropriately engaged with them. Self-regulation entails accessing, engaging with and penetrating these areas. The impressions or impulses are immediately given, and first they need to be properly *perceived*. Perceiving them is the *door* for the I to access them. When adequately perceived, the estranged *impulses* are gradually released and give way to the I. When properly perceived, the “impressions” lead to the act of cognition. Thinking will bring forth the conceptual content and the I will be able to access the synthesis of percept and concept in understanding. This cognitive processing can have many levels. Previous cognitions (cognitions-as-product—see Study 1) themselves become a given that can be perceived. When observed, previous cognitions become percepts that are brought to the act of cognition. This cognitive processing—the act of cognition turning on previous cognitions—may induce deeper and deeper levels of understanding.

In *Wahrheit und Wissenschaft*, only after he has established the *idea of cognition*—formulated as the synthesis of the immediately given with its conceptual content—Steiner introduces the concepts of the “I” and “consciousness”. As described in Study 1, to know (and thus, to become conscious of) the idea of cognition as it is immediately given in the act of cognition, Steiner initially carried out the phenomenological reduction leading to a description of the starting point of cognition. From there the idea of cognition took shape. After the idea of cognition has been brought to light, Steiner states that the *idea of cognition itself* is immediately given in human consciousness (when human consciousness engages in cognition). He then elaborates on this statement by introducing the concept of the “I”. He first observes that to the center of human consciousness—which he refers to as the “I”—external

and internal perceptions, as well as the I's own existence, are immediately given.⁵⁹ Steiner continues as follows, describing the place of the "I" in the act of cognition: "the I experiences an urge to find more in this given than what is directly given" (Steiner, 1980, p. 71). As a response to this urge: "opposite the given world, a second world arises for the I; that of thinking. And it [the I] unites the two [worlds] by realizing [in the meaning of making real, or bringing into reality], through its own agency, what we have established as the idea of knowing" (Steiner, 1980, p. 71). In other words, the I makes the idea of cognition—the synthesis of percept and concept—a *reality*, and it does this through an *act of free will*.

Thus, in addition to the steps involved in the idea of cognition itself—the lifting out of and the focusing on specific aspects of the immediately given, the bringing forth of the corresponding conceptual content, and the synthesis of the perceptual and the conceptual content—Steiner introduces the I (the center of human consciousness), which experiences external and internal perceptions, as well as itself as immediately given. Apart from the immediately given, the I also experiences thinking, and it turns to thinking because of an urge to find more in the immediately given than *is* immediately given. The I *realizes* the idea of cognition as it unites the immediately given perceptual content with the conceptual content brought forth by thinking. It realizes the idea of cognition through its own agency.⁶⁰

Only by understanding cognition itself—by becoming conscious of it, and therefore of themselves—human beings become able to fathom cognition's importance. In the final remarks of *Wahrheit und Wissenschaft*, Rudolf Steiner speaks of cognition of the *world-content*. He summarizes and concludes his observations in the following rather poetic words:⁶¹

We have seen that the innermost core of the world comes to full expression in our knowing. The lawful harmony that rules the universe becomes evident in human cognition. It is therefore our task as human beings to bring to manifest reality the

⁵⁹ Note that this is again a description of the observation of a direct experience (to which the concepts of the "I" and "consciousness" are added): to the I, perceptions (either of phenomena experienced as outside the body, or perceptions of mental content—again a further differentiation), as well as the experience of itself, are immediately given—directly experienced. Note also, that to be able to describe cognition from this perspective, thinking will have to take a step back and observe and reflect on what is happening when it, the (thinking) I, is engaged in cognition.

⁶⁰ However, at this stage the I is not aware of the idea of cognition *itself*. In other words it is not aware of the *conceptual counterpart* of the idea-of-cognition-in-action, or as-it-happens. Cognition (the idea of cognition in action) is established, but this is cognition of an *aspect of the immediately given*, not cognition of cognition *itself*. This is the reason why in human consciousness the *idea of cognition* is immediately given. It is experienced directly, but the idea is not yet known *as* an idea.

⁶¹ In these words one can sense a glimmer of a deeper intention inherent in his epistemological investigation; in them the first stirrings of Anthroposophy—still unborn at that time—can be felt.

fundamental laws that—even though they govern all of existence—would not otherwise reveal themselves. This is the essential nature of knowing, that in it the world-foundation, which can never be found in objective reality, manifests.

Figuratively speaking, our cognition is the steady, living penetration of the foundation of the world. (Steiner, 1980, p. 90)

In cognition, the “innermost core of the world” is accessed by the I, mediated by thinking. This “innermost core of the world comes to full expression in our knowing”. The I, is itself also part of the world-content—of the “innermost core of the world”. The acts of cognition that are at the heart of the cognitive processing of traumatic experience allow the I to access *itself* in its aspect of being part of the core of the world. This is no *constructing* of the self in the sense generally understood in contemporary psychology. It is *realizing*—in the sense of making reality—the I. In other words it is bringing the I in its aspect of being part of the core of the world into full(er) expression. The I is not only brought to full expression in *knowing* itself in its aspect of being part of the core of the world. Seen in the light of human development in general, the processing of traumatic experiences also enables the I to bring itself to fuller expression *in the world*.

The I, *is* the human agent. The I, *is* our innate capacity for self-regulation. Once it is able to *perceive* the areas to which it does not have (complete) access—be they of a cognitive or of a somatic nature—the “I experiences an urge” to penetrate them. The answer to the questions thrown up by some of the perceptions may come in dreams, in lucid states of altered consciousness or otherwise. But it is always the human I that initiates the act of cognition. Together with thinking *it* is the intelligent, creative, healing faculty alluded to by artists, scholars and others throughout the ages, (...and by me in the introduction of this thesis).

Overall Summary and Conclusion

Approached in an unbiased way, cognition reveals itself as an act that is purely a first-person experience. The primary goal of Study 1 was to understand the act of cognition. In other words, to *understand* understanding, to *grasp* grasping, to *know* knowing, to turn the act of cognition upon itself. Stripping away the results of all previous cognition, allowed Rudolf Steiner to arrive at the point where the act of cognition revealed itself as the coming together of what is perceived in the immediately given (the percept) and the conceptual content brought forward by thinking in response to this perception (the concept). Steiner realized that understanding can be understood as the coming together of percept and concept. As a first-person experience, understanding is the inner communion with the meaning (the concept) which is brought forward by thinking in response to the observation of the immediately given. As it occurs, this act of cognition cannot be proven, shared or observed. It can only be experienced. Understanding cognition means to penetrate this act.

The act of cognition can be understood by experiencing it and allowing thinking to reveal its essence. In other words, by allowing the act of cognition to unfold upon *itself*. All other theorizing about cognition remains on the outside of this act and brings ideas about what cognition *might* be. Contemporary cognitive psychologists and neuroscientists consider cognition primarily from a mechanistic perspective. They study cognition as a series of mechanisms that processes information and try to connect these information-processing mechanisms with neurophysiological mechanisms in the brain.

Study 1 proposed the introduction of the Goethean phenomenological approach in psychological research. This approach follows the act of cognition in that it observes given phenomena while withholding theorizing. It allows thinking to bring forth the conceptual content in response to the observation of the phenomena.

This approach was then applied to research the processing of trauma in Study 2. The inner experience of trauma processing was investigated in order to understand what happens as traumatic memories are processed. The observations of three traumatized participants undergoing therapy provided the observational data for this research. The participants observed and recorded their experiences while processing traumatic memories. Analyzing the data revealed three stages in processing. The first two stages are directly related to the act of cognition as revealed in Study 1. In the pre-processing stage impressions related to the traumatic experience intrude upon the first-person experience of the traumatized individual. The individual does not engage with or apprehend these impressions, they are foreign to them. During the processing stage the individual immerses themselves in the experience of

these impressions and now the act of cognition can unfold. The impressions are apprehended and perception of what is given leads to understanding and insight. In the third stage the individual's autonomous agency that was impeded by the traumatic impressions is restored or established. Self-worth and empowerment are notably increased.

Study 3 traced the development of thinking about psychological trauma from the mid-nineteenth century until the present moment. What are now considered symptoms related to trauma-related disorders were initially understood to be symptoms of biological damage (e.g. lesions in the spine). By the end of the nineteenth century thinking about trauma had started to take factors of a more psychological nature into account (e.g. the involvement of “self-hypnosis”). From the mid-nineteenth century until at least the first quarter of the twentieth century litigation and politics involving traumatized groups and individuals had a big influence on thinking about trauma. From the start the concept of malingering (conscious or unconscious) played an important part in litigation. Theoretically this gradually evolved to a polarity between *intentionality* and *disposition* as the cause of traumatization. Thus two polarities emerged and can be identified as a common thread in the thinking about what are now considered trauma-related disorders. A polarity concerning the *nature* of trauma (is it predominantly biological or psychological), and a polarity concerning why traumatic experiences lead to traumatization (is this caused predominantly by disposition or is intentionality involved).

In the second half of the twentieth century cognitive psychologists discovered the influence of cognitive appraisal on how (potentially stressful) events are experienced and coped with. Since then cognitive appraisal and coping have also found their way into thinking about trauma. The concept of cognitive appraisal has rendered the two polarities mentioned in the previous paragraph *dynamic*. I.e. although disposition and biology may have an role in the development of a traumatic disorder, psychological factors and intention can have a real influence on whether potentially traumatizing events lead to traumatization. Furthermore, when such events do lead to traumatization, psychological factors and intention can be recruited to help resolve it.

Since the turn of the millennium there is a rapidly increasing tendency to explain *all* factors involved in the development of traumatic disorders on a (neuro)-physiological level—even those that were previously categorized as psychological. This is beginning to come very close to a reduction of traumatized disorders to (neuro)-physiological dysregulations (effected by traumatizing experiences).

As an alternative to this development, in the second part of Study 3, the Goethean

phenomenological approach was used to observe and understand the phenomena manifesting through trauma-related symptomology. The diagnostic criteria of DSM-5 categorize trauma-related symptoms in four main groups. Based on clinical experience and related theories, two of these symptom groups were brought in relation with two clinical ways to approach traumatic memories/experiences: the symptom group of intrusions was considered related to *cognitive processing* of traumatic memories/experiences and the symptom group of arousal/reactivity was considered related to *somatic processing* of traumatic memories/experiences.

Inspired by the developmental theories of Rudolf Steiner and his successors, human development was described from the parallel perspective of embodiment and cognitive development. From both these perspectives a developing individual agent is seen as engaging with the world in which it is born and developing an intimate relationship with it. Embodiment concerns the developing individual's taking hold of (i.e. individualizing) and learning to use the body, in order to express itself in the world. The self makes its home *in* the body and acts *through* it. Cognitive development concerns the taking hold of what is immediately given as perceptions, and of understanding these perceptions by bringing forth the corresponding conceptual content (meaning). These processes were described as the transmutation of primary reflexes and of the individualization of mimicked aspects from the environment. The self was described as increasingly able to express itself in and through body, speech and thought. Through these developmental processes the human being becomes an autonomous, embodied and cognizing agent.

Traumatization was conceptualized as a dysregulation of embodiment and/or of cognitive development. The self loses its autonomous agency, or is impeded from developing (part of) it. The traumatizing experience overwhelms the individuality in its taking hold of the body and in perceiving and understanding its experiences. Immobility and truncated survival actions are reactions that are not taken hold of by the self and they lead to unwanted arousal and reactivity. Furthermore, cognitively these bodily reactions may lead to negative (self)-cognitions. Experienced traumatic impressions are not cognitively engaged with by the self. Unless the self allows itself to immerse itself in them and engage with them, the act of cognition (properly perceiving and understanding these impressions) cannot occur and the impressions remain foreign to the self—they will keep intruding upon it.

Thus, intrusions on the one hand, and arousal and reactivity on the other can be seen as invitations to the self to engage with them so that cognitive and somatic processing (i.e. taking hold of the perceptions and the bodily reactions) can commence.

In this model trauma is conceptualized as an impediment of embodiment and cognitive development. Trauma-related impulses and impressions are foreign elements that need to be actively engaged with by the self. Only once the self engages with trauma-related impulses and impressions can it regain its status of autonomous embodied and cognizing agent (or—in the case of childhood traumatization—develop into an autonomous agent).

Trauma processing follows the same routes that are followed during general human development. In essence these routes are self-regulated. However, in the case of traumatization the self-regulative capacity may need to be nudged into motion by a therapeutic approach. I consider the main goal of trauma therapy the overcoming of the victim's reluctance to start engaging with the trauma-related impulses and impressions. In my experience, once a client has overcome this reluctance the processing proceeds on its own. Meaning that the self, the individuality drives the process from within. In this sense, trauma processing is not only self-regulated in the sense in which self-regulatory processes are presently understood, it is literally *self*-regulated: regulated by the self.

The main goal of trauma therapy formulated above (overcoming a client's reluctance to engage with the traumatic material) may sound as an undervaluation of the role of therapy in resolving trauma. However, overcoming this reluctance can have many levels, and in the case of prolonged childhood traumatization it may involve rebuilding the entire cognitive basis of the traumatized individual. In the case of straightforward traumatization from a single traumatic event for which the victim does not blame themselves, overcoming reluctance may be reasonably simple and straightforward. Traumatization that has led to an extensive network of negative self-cognitions will require much more time and engagement. In moral injury the reluctance to process the trauma is probably at its highest because of the apparently justified self-condemnation that will need to be overcome before processing can properly proceed. Furthermore, when a client perceives themselves as dependent on financial (or other) support awarded to them due to their traumatization, they may not *want* to address the trauma for fear of losing the support. In such cases the reluctance to engage with the trauma may be entrenched and make processing impossible.

As stated, the human I *is* our innate capacity for self-regulation. Once it is *allowed* to perceive the areas to which it does not have (complete) access, the I will experience an urge to penetrate them. However, the human I has different levels. To most of us it is mainly known as the autonomous embodied and cognizing agent as which we know ourselves. The human I has become this autonomous embodied and cognizing agent as a result of the parallel processes of embodiment and cognitive development indicated above and described

in Study 3. Yet, as implied in the description of these parallel developments in Study 3, the driving force behind these developments is *also* the human I. *This* aspect of the human I is less well-known to most of us. This aspect of the human I is the actual intelligent, creative, healing faculty alluded to in the introduction of this thesis. Its workings can be perceived in events of synchronicity, in moments of inspiration and insight, in questions that are answered in dreams, or through the lips of others. Its workings can also be perceived in the magnificent design and workings of the human body. As such it also speaks through the aspects of our self-regulative capacity as they manifest in our physiology. Of these contemporary science starts to understand a little more. Understanding human physiology as an expression of the human I shines a new light on such processes and perhaps lifts up a tip of the veil that makes it appear as if such processes are all we are.

This almost forgotten aspect of the human I is the Self with a capital “S” that is perhaps eternal and an integral part of “innermost the core of the world” (Steiner, 1980, p. 90). This is the Self against which, ultimately, our cognitions about ourself are evaluated, whether they are trauma-related or not. Ultimately this is the Self towards which the adage “O Man, Know Thyself”—heard in the mystery places of old—points. The old mysteries have long since faded away. Presently, life events such as trauma can become a door to this Self with a capital “S”. Cognition, rightfully understood, opens up this door.

References

- Adams, L. (2021). *Learning New Skills is Easier Said Than Done*. Retrieved January 22, 2023 from <https://www.gordontraining.com/free-workplace-articles/learning-a-new-skill-is-easier-said-than-done/>
- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3 ed.). American Psychiatric Association.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4 ed.). American Psychiatric Association.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5 ed.). American Psychiatric Association. <https://doi.org/10.1176/appi.books.9780890425596>
- Anderson, J. R. (2015). *Cognitive Psychology and Its Implications* (8th ed.). Worth Publishers.
- Armour, C. (2015). The underlying dimensionality of PTSD in the diagnostic and statistical manual of mental disorders: Where are we going? *European journal of Psychotraumatology*, 6, Article 28074. <https://doi.org/10.3402/ejpt.v6.28074>
- Armour, C., Elhai, J. D., Richardson, D., Ractliffe, K., Wang, L., & Elklit, A. (2012). Assessing a five factor model of PTSD: Is dysphoric arousal a unique PTSD construct showing differential relationships with anxiety and depression? *Journal of Anxiety Disorders*, 26, 368-376. <https://doi.org/10.1016/j.janxdis.2011.12.002>
- Armour, C., Müllerová, J., & Elhai, J. D. (2016). A systematic literature review of PTSD's latent structure in the diagnostic and statistical manual of mental disorders: DSM-IV to DSM-5. *Clinical Psychology Review*, 44, 60-74. <https://doi.org/doi:10.1016/j.cpr.2015.12.003>
- Armour, C., Tsai, J., Durham, T. A., Charak, R., Biehn, T. L., Elhai, J. D., & Pietrzak, R. H. (2015). Dimensional structure of DSM-5 posttraumatic stress symptoms: Support for a hybrid anhedonia and externalizing behaviors model. *Journal of Psychiatric Research*, 61, 106-113. <https://doi.org/10.1016/j.jpsychires.2014.10.012>
- Armstrong, D. M. (1968). *A Materialist Theory of the Mind*. Routledge & Kegan Paul.
- Ayuso-Mateos, J. L. (2006). *Global Burden of post-traumatic stress disorder in the year 2000: Version 1 estimates* [Draft for Global Burden of Disease 2000]. WHO-GPE.
- Barboi, A. (2013). Sympathy, Sympathetic. Evolution of a Concept and Relevance to Current Understanding of Autonomic Disorders (S57.005). *Neurology*, 80(7 Supplement), S57.005. http://n.neurology.org/content/80/7_Supplement/S57.005.abstract
- Barrett, D. (2015). *The Committee of Sleep: How Artists, Scientists and Athletes Use Dreams for Creative Problem-Solving and How You Can Too*. Random House. (2001)

- Bauer, M. W., & Aarts, B. (2007). Corpus Construction: a Principle for Qualitative Data Collection. In M. W. Bauer & G. Gaskell (Eds.), *Qualitative Researching with Text, Image and Sound. A Practical Handbook* (pp. 19-37). Sage Publications. (2000)
- Beaney, M., Penco, C., & Vignolo, M. (Eds.). (2007). *Explaining the Mental. Naturalist and Non-Naturalist Approaches to Mental Acts and Processes*. Cambridge Scholars Publishing.
- Bechtel, W. (2008). *Mental Mechanisms. Philosophical Perspectives on Cognitive Neuroscience*. Routledge.
- Berceli, D. (2008). *The Revolutionary Trauma Release Process: Transcend Your Toughest Times*. Namaste Publishing.
- Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and Initial Psychometric Evaluation. *Journal of Traumatic Stress, 28*, 489-498. <https://doi.org/10.1002/jts.22059>
- Boeschoten, M. A., Bakker, A., Jongedijk, R. A., & Olf, M. (2014). *PTSD Checklist for DSM-5 and Life Events Checklist for DSM-5 with extended A criterion—Nederlandstalige versie*. Stichting Centrum '45, Arq Psychotrauma Expert Groep, Diemen. https://www.psychotraumadiagnostics.centrum45.nl/sites/default/files/domain-38/documents/pcl-5_en lec-5_met_uitgebreide_a_criterium_nl_versie_1.1_ref-38-14932105481148603842.pdf
- Bortoft, H. (1996). *The Wholeness of Nature : Goethe's Way Toward a Science of Conscious Participation in Nature*. Lindisfarne Press.
- Bortoft, H. (2012). *Taking Appearance Seriously: The Dynamic Way of Seeing in Goethe and European Thought*. Floris Books.
- Brady, R. (2006). Direct Experience. In G. Maier, R. Brady, & S. Edelglass (Eds.), *Being on Earth: Practice in Tending the Appearances* (pp. 11-35). SNSRI / The Nature Institute.
- Brady, R. H. (posthumous). How We Make Sense of the World. A Study in Rudolf Steiner's Epistemological Work. <https://www.natureinstitute.org/ronald-h-brady/how-we-make-sense-of-the-world>
- Braun, V., & Clarke, V. (2006). Using Thematic Analysis in Psychology. *Qualitative Research in Psychology, 3*(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Brodie, B. C., Sir. (1837). Pathological and Surgical Observations Relating to Injuries of the Spinal Cord. *Medico-Chirurgical Transactions, 20*, 118-164.
- Brom, D., Stokar, Y., Lawi, C., Nuriel-Porat, V., Ziv, Y., & Lerner, K. (2017). Somatic Experiencing for Posttraumatic Stress Disorder: A Randomized Controlled Outcome Study. *Journal of Traumatic Stress, 30*, 304-312. <https://doi.org/10.1002/jts.22189>

- Brook, I. H. (2009). Dualism, Monism and the Wonder of Materiality as Revealed through Goethean Observation. *PAN: Philosophy Activism Nature*, 6, 31-39.
- Buchanan, T. W. (2007). Retrieval of Emotional Memories. *Psychological Bulletin*, 133(5), 761-779. <https://doi.org/10.1037/0033-2909.133.5.761>
- Bufka, L. F., Wright, C. V., & Halfond, R. W. (Eds.). (2020). *Casebook to the APA Clinical Practice Guideline for the Treatment of PTSD*. American Psychological Association. <https://doi.org/10.1037/0000196-000>.
- Cannon, W. B. (1915). *Bodily Changes in Pain, Hunger, Fear and Rage: An account of Recent Researches into the function of emotional excitement*. D. Appleton and Company.
- Cannon, W. B. (1926). *Physiological Regulation of Normal States: Some Tentative Postulates Concerning Biological Homeostatics*. Editions Medicales.
- Cannon, W. B. (1927). The James-Lange Theory of Emotions: A Critical Examination and an Alternative Theory. *The American Journal of Psychology*, 39, 106-124. <https://doi.org/10.2307/1415404>
- Cannon, W. B. (1957). Voodoo Death. *Psychosomatic Medicine*, 19(3), 182-190. (1942)
- Castleberry, A., & Nolan, A. (2018). Thematic analysis of qualitative research data: Is it as easy as it sounds? *Currents in Pharmacy Teaching and Learning*, 10, 807-815. <https://doi.org/10.1016/j.cptl.2018.03.019>
- Cavalcante, F. G., Morita, P. A., & Haddad, S. R. (2009). Sequelas invisíveis dos acidentes de trânsito: o transtorno de estresse pós-traumático como problema de saúde pública. *Ciência e Saude Coletiva*, 14(5), 1763-1772.
- Chalmers, D. J. (2004). The Representational Character of Experience. In B. Leiter (Ed.), *The Future of Philosophy* (pp. 153-181). Oxford University Press.
- Clapp, J. D., Kemp, J. J., & Tuerk, P. W. (2016). Patterns of Change in Response to Prolonged Exposure: Implications for Treatment Outcome. *Depression and Anxiety*, 33, 807-815. <https://doi.org/10.1002/da.22534>
- Cogan, J. (2021, 19 Sept.). The Phenomenological Reduction. *The Internet Encyclopedia of Philosophy*. <https://iep.utm.edu/phen-red/#SSSH5a.i.1>
- Cognition. In. (2015). *Oxford Dictionary of English*.
- Cognition. In. (n.d.). *Merriam-Webster Dictionary*. Retrieved August 10, 2020, from <https://www.merriam-webster.com/dictionary>
- Cognitive. In. (n.d.). *Merriam-Webster Dictionary*. Retrieved August 10, 2020, from <https://www.merriam-webster.com/dictionary>

- Conselho Nacional de Saúde. (2013). Resolução N°466, de 12 de Dezembro de 2012. *Diário Oficial da União*, 13 junho 2013(1), 59.
- Corbin, J., & Strauss, A. (2015). *Basics for Qualitative Research. Techniques and Procedures for Developing Grounded Theory* (4 th ed.). Sage.
- Cruz, R. M., Wit, P. A. J. M. d., & Carolina, Z. d. S. (Eds.). (2020). *Manual de Psicologia do Trânsito* (2nd ed.). Vetor Editora.
- de Wit, P. (2016). *Learning to breathe from the breath itself: An introduction to Rebirthing-Breathwork and a phenomenological exploration of breathing*. KDP/Author.
- de Wit, P. A. J. M. (2019). *Posttraumatic Stress Disorder: Theoretical Model and Evaluation of an Intervention with Firefighters in Santa Catarina* (Publication Number PSI0830-D) [Master dissertation, Universidade Federal de Santa Catarina].
<http://tede.ufsc.br/teses/PPSI0830-D.pdf>
- de Wit, P. A. J. M., & Cruz, R. M. (2019). Learning from AF447: Human-machine interaction. *Safety Science*, 112, 48-56. <https://doi.org/10.1016/j.ssci.2018.10.009>
- de Wit, P. A. J. M., & Cruz, R. M. (2021). Treating PTSD with Connected Breathing: A Clinical Case Study and Theoretical Implications. *European Journal of Trauma & Dissociation*, 5(3), Article 100152. <https://doi.org/10.1016/j.ejtd.2020.100152>
- de Wit, P. A. J. M., Dias de Oliviera, C. A., Costa, R. V. d. L., Cruz, R. M., & Menezes, C. B. (2019). An exploration of the processing of suppressed memories during Rebirthing-Breathwork. *Revista Brasileira de Psicoterapia*, 21(1), 71-84.
<https://doi.org/10.5935/2318-0404.20190005>
- de Wit, P. A. J. M., Menezes, C. B., Dias de Oliviera, C. A., Costa, R. V. d. L., & Cruz, R. M. (2018). Rebirthing-Breathwork, activation of the autonomic nervous system, and psychophysiological defenses. *Revista Brasileira de Psicoterapia*, 20(2), 29-42.
<https://doi.org/10.5935/2318-0404.20180017>
- Dębiec, J., & LeDoux, J. (2009). The Amygdala and the Neural Pathways of Fear. In P. J. Shiromani, T. M. Keane, & J. LeDoux (Eds.), *Post-Traumatic Stress Disorder: Basic Science and Clinical Practice* (pp. 23-38). Humana Press.
- Dewey, J. (1929). *Experience and Nature*. George Allen & Unwin, Ltd.
- Dudenredaktion. (2015). *Deutsches Universalwörterbuch*.
- Edelglass, S., Maier, G., Gebert, H., & Davy, J. (1997). *The Marriage of Sense and Thought: Imaginative Participation in Science*. Lindisfarne Books.
- Ellenberger, H. F. (1970). *The Discovery of the Unconscious: The History and Evolution of Dynamic Psychiatry*. Basic Books.
- Elman, J. L., Bates, E. A., Johnson, M. H., Karmiloff-Smith, A., Parisi, D., & Plunkett, K. (1996). *Rethinking Innateness: A Connectionist Perspective on Development*. MIT

Press.

- Erichsen, J. E. (1866). *On Railway and Other Injuries of the Nervous System*. Walton and Maberly.
- Erichsen, J. E. (1882). *On Concussion of the Spine, Nervous Shock, and Other Obscure Injuries of the Nervous System, in their Clinical and Medico-Legal Aspects*. Birmingham&Co. (1875)
- Experience. In. (n.d.). *Merriam-Webster Dictionary*. Retrieved December 1, 2022, from <https://www.merriam-webster.com/dictionary>
- Eysenck, M. W., & Keane, M. T. (2020). *Cognitive Psychology: A Student's Handbook* (8th ed.). Psychology Press.
- Farnell, D. (2013). How Belief Works. *Think*, 35(12), 39-60.
<https://doi.org/10.1017/S1477175613000171>
- Fechner, G. T. (1860). *Elemente der Psychophysik*. Breitkopf und Härtel.
- Foa, E. B., Keane, T. M., Friedman, M. J., & Cohen, J. A. (Eds.). (2009). *Effective Treatments for PTSD: Practice Guidelines from the International Society for Traumatic Stress Studies* (2nd ed.). Guilford Press.
- Freud, S. (1955). Appendix: Memorandum on the Electrical Treatment of War Neurotics. J. Starchey, Ed. & Trans. In *The Standard Edition of the Complete Psychological Works of Sigmund Freud* (Vol. XVII (1917-1919): An Infantile Neurosis and Other Works, pp. 211-215). The Hogarth Press and the Institute of Psychoanalysis.
- Furneaux Jordan, J. (1880). *Surgical Inquiries; Including the Hastings Essay on Shock, The Treatment of Surgical Inflammations, and Numerous Clinical Lectures* (2nd ed.). J. & A. Churchill.
- Gallup, G. G., Jr. (1974). Animal Hypnosis: Factual Status of a Fictional Concept. *Psychological Bulletin*, 81(11), 836-853.
- Gaskell, G. (2007). Individual and Group Interviewing. In M. W. Bauer & G. Gaskell (Eds.), *Qualitative Researching with Text, Image and Sound. A Practical Handbook* (pp. 38-56). Sage publications. (2000)
- Gerrig, R. J. (2013). *Psychology and Life* (20th ed.). Pearson.
- Gilbert, D. T. (1991). How Mental Systems Believe. *American Psychologist*, 46(2), 107-119.
- Gilbert, D. T. (1992). The Assent of Man: Mental Representation and the Control of Belief. In D. M. Wegner & J. W. Pennebaker (Eds.), *Handbook of Mental Control* (pp. 57-87). Prentice-Hall.
- Gilbert, D. T., Tafarodi, R. W., & Malone, P. S. (1993). You Can't Believe Everything You Read. *Journal of Personality and Social Psychology*, 65(2), 221-233.

- Gilbert, H. (2005). *At the Source: The Incarnation of the Child and the Development of a Modern Pedagogy*. The Association of Waldorf Schools of North America.
- Ginsburg, H. J. (1975). Defensive distance and immobility in young precocial birds (*Gallus gallus*). *Developmental Psychobiology*, 8, 281-285.
- Glaser, B. G., & Strauss, A. L. (2006). *Strategies for Qualitative Research*. Aldine Transaction. (1967)
- Glöckler, M. (2019). *Truth, Beauty and Goodness: The Future of Education, Healing Arts and Health Care* Waldorf Publications.
- Goddard Blythe, S. (2014). *Neuromotor Immaturity in Children and Adults: The INPP Screening Test for Clinicians and Health Practicioners*. Wiley Blackwell.
- Goddard, G. V., McIntyre, D. C., & Leech, C. K. (1969, Nov). A permanent change in brain function resulting from daily electrical stimulation. *Exp Neurol*, 25(3), 295-330. [https://doi.org/10.1016/0014-4886\(69\)90128-9](https://doi.org/10.1016/0014-4886(69)90128-9)
- Goethe, J. W. v. (1988). *Scientific Studies* (D. Miller, Ed. & Trans. Vol. 12). Suhrkamp Publishers.
- Goldstein, E. B. (2015). *Cognitive Psychology. Connecting Mind, Research, and Everyday Experience* (4th ed.). Cengage Learning.
- Gray, M., Litz, B., Hsu, J., & Lombardo, T. (2004). Psychometric properties of the Life Events Checklist. *Assessment*, 11, 330-341. <https://doi.org/10.1177/1073191104269954>
- Grof, S. (1985). *Beyond the Brain: Birth, death and transcendancy in psychotherapy* (Vol. State University of New York Press).
- Grof, S. (1988). *Adventures in self-discovery*. State University of New York Press.
- Grof, S., & Grof, C. (2010). *Holotropic Breathwork: A New Approach to Self-Exploration and Therapy*. State University of New York Press.
- Harrington, R. (2001). The Railway Accident: Trains, Trauma, and Technological Crises in Nineteenth-Century Britain. In M. S. Micale & P. Lerner (Eds.), *Traumatic Pasts: History, Psychiatry, and Trauma in the Modern Age, 1870-1930* (pp. 31-56). Cambridge University Press.
- Harris, R. (2017). *Listening to Ayahuasca: New Hope for Depression, Addiction, PTSD, and Anxiety*. New World Library.
- Hauschka, R. (2008). *Nutrition: A Holisitic Approach* (M. Spock & M. T. Richards, Trans.). Sophia Books. (1951)
- Held, C., Knauff, M., & Vosgerau, G. (Eds.). (2006). *Mental Models and the Mind. Current*

Developments in Cognitive Psychology, Neuroscience, and Philosophy of Mind.
Elsevier.

- Hofer, M. A. (1970). Cardiac and Respiratory Function During Sudden Prolonged Immobility in Wild Rodents. *Psychosomatic Medicine*, 32(6), 633-648.
- Hoffmann, N. (1998). The Unity of Science and Art: Goethean phenomenology as a new ecological discipline. In D. Seamon & A. Zajonc (Eds.), *Goethe's Way of Science: A phenomenology of nature* (pp. 129-175). State University of New York Press.
- Hofmann, S. G. (2012). *An Introduction to Modern CBT: Psychological Solutions to Mental Health Problems*. Wiley-Blackwell.
- Hoge, C. W., Yehuda, R., Castro, C. A., McFarlane, A. C., Vermetten, E., Jetly, R., Koenen, K. C., Greenberg, N., Shalev, A. Y., Rauch, S. M., Marmar, C. R., & Rothbaum, B. O. (2016). Unintended Consequences of Changing the Definition of Posttraumatic Stress Disorder in DSM-5: Critique and Call for Action [Special Communication]. *JAMA Psychiatry*, 73(7), 750-752.
<http://jamanetwork.com/pdfaccess.ashx?url=/data/journals/psych/935409/>
- Humphrey, J. H. (2005). *Anthology of Stress Revisited: Selected Works of James H. Humphrey*. Novinka Books.
- Husserl, E. (1990). *The Idea of Phenomenology* [Die Idee der Phänomenologie. Fünf Vorlesungen] (W. P. Alston & G. Nakhnikian, Trans.). Kluwer Academic Publishers. (1950)
- Jacobson, N. S., & Truax, P. (1991). Clinical Significance: A Statistical Approach to Defining Meaningful Change in Psychotherapy Research. *Journal of Consulting and Clinical Psychology*, 59, 12-19.
- James, W. (1884). What is an Emotion? *Mind*, 9(34), 188-205.
<https://www.jstor.org/stable/2246769>
- Jaworski, J. (1996). *Synchronicity: The inner path of leadership*. Berrett-Koehler.
- Johnson, S. (2003). Fear in the Brain. *Discover Magazine*, (March 2003).
<https://www.discovermagazine.com/mind/fear-in-the-brain>
- Johnson-Laird, P. N. (1983). *Mental Models. Towards a Cognitive Science of Language, Inference, and Consciousness*. Harvard University Press.
- Jung, C. G. (2014). *The Collected Works of C. G. Jung: Complete Digital Edition*. Princeton University Press.
- Kant, I. (2004). *Prolegomena to Any Future Metaphysics, That Will Be Able to Come Forward as Science: with Selections from the Critique of Pure Reason* (G. Hatfield, Trans.; Revised ed.). Cambridge University Press.
- Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., Üstün, B., &

- Wang, P. S. (2009). The global burden of mental disorders: An update from the WHO World Mental Health (WMH) Surveys. *Epidemiologia e Psichiatria Sociale*, 18(1), 23-33.
- Kharitidi, O. (1997). *Entering the Circle. Ancient Secrets of Siberian Wisdom Discovered by a Russian Psychiatrist*. HarperCollins. (1996)
- Kharitidi, O. (2001). *Master of Lucid Dreams. In the Heart of Asia A Russian Psychiatrist Learns How to Heal the Spirit of Trauma*. Hampton Roads Publishing Company.
- Koenen, K. C., Ratanatharathorn, A., Ng, L., McLaughlin, K. A., Bromet, E. J., Stein, D. J., Karam, E. G., Meron Ruscio, A., Benjet, C., Scott, K., Atwoli, L., Petukhova, M., Lim, C. C. W., Aguilar-Gaxiola, S., Al-Hamzawi, A., Alonso, J., Bunting, B., Ciutan, M., de Girolamo, G., Degenhardt, L., Gureje, O., Haro, J. M., Huang, Y., Kawakami, N., Lee, S., Navarro-Mateu, F., Pennell, B. E., Piazza, M., Sampson, N., Ten Have, M., Torres, Y., Viana, M. C., Williams, D., Xavier, M., & Kessler, R. C. (2017, Oct). Posttraumatic stress disorder in the World Mental Health Surveys. *Psychological Medicine*, 47(13), 2260-2274. <https://doi.org/10.1017/S0033291717000708>
- Krippner, S. C. (2011). Dreams and Creativity. In M. A. Runco & S. R. Pritzker (Eds.), *Encyclopedia of Creativity* (2 ed., Vol. 1, pp. 409-414). Academic Press.
- Langdridge, D. (2007). *Phenomenological Psychology. Theory, Research and Method*. Pearson Education Limited.
- Lazarus, R. S. (1982). Thoughts on the Relations Between Emotion and Cognition. *American Psychologist*, 37(9), 1019-1024.
- Lazarus, R. S. (1993). From Psychological Stress to the Emotions: A History of Changing Outlooks. *Annual Review of Psychology*, 44(1), 1-22. <https://doi.org/10.1146/annurev.ps.44.020193.000245>
- Le Gros Clarke, F. (1870). *Lectures on the Principles of Surgical Diagnosis: Especially in Relation to Shock and Visceral Lesions*. John Churchill and Sons.
- LeDoux, J. (1996). *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*. Simon & Schuster.
- LeDoux, J. (2014). Rethinking the Emotional Brain. In J. Dębiec, M. Heller, B. Brożek, & J. LeDoux (Eds.), *The Emotional Brain Revisited* (pp. 13-83). Copernicus Center Press. (2012)
- LeDoux, J. E. (2000). Emotion Circuits in the Brain. *Annual Review of Neuroscience*, 23(1), 155-184.
- Lehrs, E. (1951). *Man or Matter: Introduction to a Spiritual Understanding of Nature on the Basis of Goethe's Method of Training Observation and Thought*. Faber and Faber Ltd. <https://archive.org/download/manormatter05641gut/elmom10p.pdf>
- Lerner, P. (2001). From Traumatic Neurosis to Male Hysteria: The Decline and Fall of

- Hermann Oppenheim, 1889-1919. In M. S. Micale & P. Lerner (Eds.), *Traumatic Pasts: History, Psychiatry, and Trauma in the Modern Age, 1870-1930* (pp. 140-171). Cambridge University Press.
- Levine, P. A. (2008). *Healing Trauma: A Pioneering Program for Restoring the Wisdom of Your Body*. Sounds True. (2005)
- Levine, P. A. (2010). *In an Unspoken Voice: How the Body Releases Trauma and Restores Goodness*. North Atlantic Books.
- Levine, P. A. (2015). *Trauma and Memory: Brain and Body in a Search of the Living Past*. North Atlantic Books.
- Levine, P. A., (with Frederick, A.). (1997). *Waking the Tiger: Healing Trauma*. North Atlantic Books.
- Lindenberg, C. (2012). *Rudolf Steiner: A biography* (J. McAlice, Trans.). Steinerbooks.
- List of rail accidents (before 1880). (2018, March 14). In *Wikipedia*.
[https://en.wikipedia.org/w/index.php?title=List_of_rail_accidents_\(before_1880\)&oldid=830301044](https://en.wikipedia.org/w/index.php?title=List_of_rail_accidents_(before_1880)&oldid=830301044)
- Liu, P., Wang, L., Cao, C., Wang, R., Zhang, J., Zhang, B., Wu, Q., Zhang, H., Zhao, Z., Fan, G., & Elhai, J. D. (2014). The underlying dimensions of DSM-5 posttraumatic stress disorder symptoms in an epidemiological sample of Chinese earthquake survivors. *Journal of Anxiety Disorders, 28*, 345-351.
<https://doi.org/10.1016/j.janxdis.2014.03.008>
- Lorkowski, C. M. (12 November 2021). David Hume: Causation. *Internet Encyclopedia of Philosophy. A Peer-Reviewed Academic Resource*. <https://iep.utm.edu/hume-cau/>
- Maguire, M., & Delahunt, B. (2017). Doing a Thematic Analysis: A Practical, Step-by-Step Guide for Learning and Teaching Scholars. *AISHE-J, 8*(3), Article 335.
<http://ojs.aishe.org/index.php/aishe-j/article/view/335>
- Maier, G., Brady, R., & Edelglass, S. (2006). *Being on Earth: Practice in Tending the Appearances*. SNSRI / The Nature Institute.
- Marks, I. M. (1987). *Fears, Phobias, and Rituals: Panic, Anxiety, and Their Disorders*. Oxford University Press.
- Marmar, C. R., McCaslin, S. E., Metzler, T. J., Best, S., Weiss, D. S., Fagan, J., Liberman, A., Pole, N., Otte, C., Yehuda, R., Mohr, D., & Neylan, T. (2006). Predictors of Posttraumatic Stress in Police and Other First Responders. *Annals of the New York Academy of Sciences, 1071*, 1-18. <https://doi.org/10.1196/annals.1364.004>
- Matlin, M. W., & Farmer, T. A. (2016). *Cognition* (9th ed.). John Wiley & Sons, Inc.
- Maul, A., Irribarra, D. T., & Wilson, M. (2016). On the Philosophical Foundations of Psychological Measurement. *Measurement, 76*, 311-320.

<https://doi.org/10.106/j.measurment.2015.11.001>

- Maxwell, H., Sir. (Ed.). (1904). *The Creevey Papers: A Selection from the Correspondence & Diaries of the Late Thomas Creevey, M.P. Born 1768 – died 1838*. John Murray.
- McClelland, J. L., McNaughton, B. L., & O'Reilly, R. C. (1995). Why there are complementary learning systems in the hippocampus and neocortex: insights from the successes and failures of connectionist models of learning and memory. *Psychological Review*, *102*(3), 419-457. <https://doi.org/10.1037/0033-295x.102.3.419>
- McCraty, R., & Shaffer, F. (2015). Heart Rate Variability: New Perspectives on Physiological Mechanisms, Assessment of Self-regulatory Capacity, and Health Risk. *Global Advances in Health and Medicine*, *4*(1), 46-61. <https://doi.org/10.7453/gahmj.2014.073>
- McGilchrist, I. (2019). *The Master and His Emissary. The Divided Brain and the Making of the Western World. New Expanded Edition* (2nd ed.). Yale University Press.
- Merleau-Ponty, M. (2005). *Phenomenology of Perception* [Phénoménologie de la perception] (C. Smith, Trans.). Routledge. (1945)
- Merleau-Ponty, M. (2012). *Phenomenology of Perception* (D. A. Landes, Trans.). Routledge. (1945)
- Micale, M. S. (2001). Jean-Martin Charcot and “les névroses traumatiques”: From Medicine to Culture in French Trauma Theory of the Late Nineteenth Century. In M. S. Micale & P. Lerner (Eds.), *Traumatic Pasts: History, Psychiatry, and Trauma in the Modern Age, 1870-1930* (pp. 115-139). Cambridge: Cambridge University Press.
- Micale, M. S. (2008). *Hysterical Men: The Hidden History of Male Nervous Illness*. Harvard University Press.
- Michell, J. (2000). Normal Science, Pathological Science and Psychometrics. *Theory & Psychology*, *10*(5), 639-667.
- Mitchell, D. (Ed.). (2015). *From Images to Thinking* (Vol. 17). Waldorf Publications. (2011).
- Monson, C. M., Gradus, J. L., Young-Xu, Y., Schnurr, P. P., Price, J. L., & Schumm, J. A. (2008). Change in Posttraumatic Stress Disorder Symptoms: Do Clinicians and Patients Agree? *Psychological Assessment*, *20*(2), 131-138. <https://doi.org/10.1037/1040-3590.20.2.131>
- Moran, D. (2000). *Introduction to Phenomenology*. Routledge.
- National Center for PTSD. (2017a, April 11). *Life Events Checklist for DSM-5 (LEC-5)*. https://www.ptsd.va.gov/professional/assessment/te-measures/life_events_checklist.asp
- National Center for PTSD. (2017b, May 11). *PTSD Checklist for DSM-5 (PCL-5)*. <https://www.ptsd.va.gov/professional/assessment/adult-sr/ptsd-checklist.asp>

- National Center for PTSD. (n.d.). Using the PTSD Checklist for DSM-5 (PCL-5) [PDF document]. <https://www.ptsd.va.gov/professional/assessment/documents/using-PCL5.pdf>
- Newell, A. (1980). Physical Symbol Systems. *Cognitive Science*, 4, 135-183.
- Nielson, J. L., & Megler, J. D. (2014). Ayahuasca as a Candidate Therapy for PTSD. In B. C. Labate & C. Cavnar (Eds.), *The Therapeutic Use of Ayahuasca* (pp. C1-C1). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-40426-9_14
- Nolen-Hoeksema, S., Fredrickson, B. L., Loftus, G. R., & Wagenaar, W. A. (2009). *Atkinson & Hilgard's Introduction to Psychology* (15 ed.). Wadsworth Cengage Learning.
- Norris, F. N., & Slone, L. B. (2013). Understanding Research on the Epidemiology of Trauma and PTSD. *PTSD Research Quarterly*, 24(2/3), 1-13.
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Thrustworthiness Criteria. *International Journal of Qualitative Methods*, 16, 1-13. <https://doi.org/10.1177/1609406917733847>
- Objective. In. (2015). *New Oxford American Dictionary*.
- Oppenheim, H. (1889). *Die traumatischen Neurosen: nach den in der Nervenlinik der Charité in den letzten 5 Jahren gesammelten Beobachtungen*. August Hirschwald.
- Page, H. W. (1885). *Injuries of the Spine and Spinal Cord Without Apparent Mechanical Lesions, and Nervous Shock, in their Surgical and Medico-Legal Aspects* (2 ed.). J. & A. Churchill.
- Page, H. W. (1892). *Railway Injuries: with Special Reference to those of the Back and Nervous System, in their Medico-Legal and Clinical Aspects*. William Wood and Company.
- Page, H. W. (1897). On the Mental Aspect of Some Traumatic Neuroses. In H. W. Page. *Clinical Papers on Surgical Subjects* (pp. 11-33). Cassel and Company Ltd.
- Pasquali, L. (1996). Teoria da Medida. In L. Pasquali (Ed.), *Teoria e métodos de medida em ciências do comportamento* (pp. 21-41). Instituto Nacional de Estudos e Pesquisas Educacionais.
- Payne, P., Levine, P. A., & Crane-Godreau, M. A. (2015). Somatic experiencing: using interoception and proprioception as core elements of trauma therapy. *Frontiers in Psychology*, 6. <https://doi.org/10.3389/fpsyg.2015093>
- Perner, J. (1993). *Understanding the Representational Mind*. The MIT Press. (1991)
- Peterson, A. L., Foa, E. B., & Riggs, D. S. (2019). Prolonged exposure therapy. In *Treating PTSD in military personnel: A clinical handbook, 2nd ed.* (pp. 46-62). The Guilford Press.

- Phoenix, A., & Thomas, K. (2002). Psychology in the 21st century. In D. Miell, A. Phoenix, & K. Thomas (Eds.), *Mapping Psychology 1* (pp. 1-42). The Open University.
- Pinker, S. (1995). *The Language Instinct: How the Mind Creates Language*. Harper Perennial. (1994)
- Porges, S. (2001). The polyvagal theory: phylogenetic substrates of a social nervous system. *International Journal of Psychophysiology*, 42(2), 123-146.
- Porges, S. (2011). *The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation*. W. W. Norton & Company.
- Putnam, J. J. (1898). On the Etiology and Pathogenesis of the Post-traumatic Psychoses and Neuroses. *Journal of Nervous and Mental Disease*, 25(11), 769-799.
- Ramsey, W. M. (2007). *Representation Reconsidered*. Cambridge University Press.
- Richter, C. P. (1957). On the Phenomenon of Sudden Death in Animals and Man. *Psychosomatic Medicine*, 19(3), 191-198.
- Robb, A. (2018). *Why We Dream: The Transformative Power of Our Nightly Journey*. Houghton Mifflin Harcourt.
- Rothenberg, A. (1995). Creative Cognitive Processes in Kekulé's Discovery of the Structure of the Benzen Molecule. *The American Journal of Psychology*, 108(3), 419-438.
- Roudebush, M. (2001). A Battle of Nerves: Hysteria and Its Treatments in France During World War I. In M. S. Micale & P. Lerner (Eds.), *Traumatic Pasts: History, Psychiatry, and Trauma in the Modern Age, 1870-1930* (pp. 253-279). Cambridge University Press.
- Sassoon, S. (1917). Survivors. <https://englishverse.com/poems/survivors>
- Scaer, R. C. (2001). The Neurophysiology of Dissociation and Chronic Disease. *Applied Psychophysiology and Biofeedback*, 26(1), 73-91.
- Schachter, S., & Singer, J. E. (1962). Cognitive, Social and Physiological Determinants of Emotional State. *Physiological Review*, 69(5), 379-399.
- Schacter, D. L., & Tulving, E. (Eds.). (1994). *Memory Systems 1994*. MIT Press.
- Scharmer, C. O. (2016). *Theory U: Leading from the future as it emerges* (2 ed.). Berrett-Koehler.
- Scharmer, C. O., & Kaufer, K. (2013). *Leading from the emerging future: From ego-system to eco-system economies*. Berrett-Koehler.
- Schauer, M., & Elbert, T. (2010). Dissociation Following Traumatic Stress: Etiology and Treatment. *Zeitschrift für Psychologie / Journal of Psychology*, 218(2), 109-127.

<https://doi.org/10.1027/0044-3409/a000018>

- Schivelbusch, W. (2014). *The Railway Journey: The Industrialization of Time and Space in the Nineteenth Century*. University of California Press. (1977)
- Seamon, D., & Zajonc, A. (Eds.). (1998). *Goethe's Way of Science: A Phenomenology of Nature*. State University of New York Press.
- Searle, J. R. (1980). Minds, brains, and programs. *The Behavioral and Brain Sciences*, 3, 417-424. <https://doi.org/10.1017/S0140525X00005756>
- Seligman, M. E. P. (1975). *Helplessness: On Depression, Development and Death*. W. H. Freeman.
- Selye, H. (1936). A Syndrome Produced by Diverse Nocuous Agents. *Nature*, 138(July 4), 32. <https://doi.org/10.1038/138032a0>
- Selye, H. (2018). *The Nature of Stress* [posthumously published article]. <http://www.icnr.com/articles/the-nature-of-stress.html>
- Servan-Schreiber, D. (2004). *The Instinct to Heal: Curing Stress, Anxiety, and Depression Without Drugs and Without Talk Therapy*. Random House. (2003)
- Shanon, B. (2014). Moments of Insight, Healing, and Transformation: A Cognitive Phenomenological Analysis. In B. C. Labate & C. Cavnar (Eds.), *The Therapeutic Use of Ayahuasca* (pp. 59-75). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-40426-9_4
- Shapiro, F. (2001). *Eye Movement Desensitization and Reprocessing (EMDR): Basic Principles, Protocols, and Procedures*. The Guildford Press.
- Shapiro, F. (2002). Introduction: Paradigms, Processing, and Personality Development. In F. Shapiro (Ed.), *EMDR as an Integrative Psychotherapy Approach: Experts of Diverse Orientations Explore the Paradigm Prism*. (pp. 3-26). American Psychological Association.
- Shapiro, F., & Laliotis, D. (2011). EMDR and the Adaptive Information Processing Model: Integrative Treatment and Case Conceptualization. *Clinical Social Work Journal*, 39, 191-200. <https://doi.org/10.1007/s10615-010-0300-7>
- Solomon, R. M., & Shapiro, F. (2008). EMDR and the Adaptive Information Processing Model: Potential Mechanisms of Change. *Journal of EMDR practice and Research* 2(4), 315-325. <https://doi.org/10.1891/1933-3196.2.4.315>
- Steiner, R. (1980). *Wahrheit und Wissenschaft: Vorspiel einer "Philosophie der Freiheit"* [Truth and Knowledge: Prelude to a "Philosophy of Freedom"] (5 ed.). Rudolf Steiner Verlag. (1892)
- Steiner, R. (1981). *Truth and Knowledge* (R. Stebbing, Trans.; P. M. Allen, Ed.). Steinerbooks. (1892)

- Steiner, R. (1987). *Einleitungen zu Goethes Naturwissenschaftlichen Schriften. Zugleich eine Grundlegung der Geisteswissenschaft (Anthroposophie)*. Rudolf Steiner Verlag. (1884-1897)
- Steiner, R. (1995a). *Die Philosophie der Freiheit: Grundzüge einer modernen Weltanschauung*. [The Philosophy of Freedom: Fundamentals of a Modern Worldview] (2nd ed.). Rudolf Steiner Verlag. (1894 / 1918 [2nd ed.])
- Steiner, R. (1995b). *Intuitive Thinking as a Spiritual Path: A Philosophy of Freedom* (M. Lipson, Trans.). Anthroposophical Press. (1894)
- Steiner, R. (1998). *Menschliches Seelenleben und Geistesstreben im Zusammenhange mit der Welt- und Erdentwicklung* [Human Soul life and Spiritual Aspiration in the Context of World- and Earth Development]. Rudolf Steiner Verlag. (1978)
- Steiner, R. (2003a). *Grundlinien einer Erkenntnistheorie der goetheschen Weltanschauung: Mit besonderer Rücksicht auf Schiller* [An Outline of an Epistemology of the Goethean Worldview: With Special Consideration of Schiller] (8 ed.). Rudolf Steiner Verlag. (1886)
- Steiner, R. (2003b). *Theosophie. Einführung in übersinnliche Welterkenntnis und Menschenbestimmung* [Theosophy. Introduction to supernatural knowledge of the world and the destiny of the human being] (32 ed.). Rudolf Steiner Verlag. (1904)
- Stephan, A. (2005). *Emergenz: Von der Unvorhersagbarkeit zur Selbstorganisation*. Mentis. (1999)
- Stephan, A. (2006). The Dual Role of ‘Emergence’ in the Philosophy of Mind and in Cognitive Science. *Synthese*, 151, 485-498. <https://doi.org/10.1007/s11229-006-9019-y>
- Stickgold, R. (2002). EMDR: A Putative Neurobiological Mechanism of Action. *Journal of Clinical Psychology*, 58(1), 61-75.
- Stone, H., & Stone, S. L. (1989). *Embracing our Selves: The Voice Dialogue Manual*. New World Library.
- Subject. In. (n.d.). *Merriam-Webster Dictionary*. Retrieved August 1, 2022, from <https://www.merriam-webster.com/dictionary>
- Subjective. In. (2015). *New Oxford American Dictionary*.
- Tarantino, Q. (2003) *Kill Bill: Volume 1* [Film]. Miramax Films.
- The American Heritage. (2002). Psychological trauma. In *Stedman's Medical Dictionary*.
- The Lancet. (1862). *The Influence of Railway Travelling on Public Health*. Robert Hardwicke.

- the u.lab team. (2015). *u.lab 1x: Source Book*. Presencing Institute, MIT.
https://courses.edx.org/asset-v1:MITx+3T2015+type@asset+block/U.lab_SourceBook_v3a.pdf
- Trauma. In. (n.d.). *Merriam-Webster Dictionary*. Retrieved Januari 15, 2023, from <https://www.merriam-webster.com/dictionary>
- Traumatize. In. (2015). *New Oxford American Dictionary*.
- Tsai, J., Harpaz-Rotem, I., Armour, C., Southwick, S. M., Krystal, J. H., & Pietrzak, R. H. (2015). Dimensional structure of DSM-5 posttraumatic stress disorder symptoms: Results from the National Health and Resilience in Veterans Study. *Journal of Clinical Psychiatry*, 76, 546-553. <https://doi.org/10.4088/JCP.14m09091>
- van der Hart, O., & van der Kolk, B. A. (1989). Pierre Janet and the Breakdown of Adaptation in Psychological Trauma. *American Journal of Psychiatry*, 146(12), 1530-1540.
- van der Kolk, B. A. (2002). Beyond the Talking Cure: Somatic Experience and Subcortical Imprints in the Treatment of Trauma. In F. Shapiro (Ed.), *EMDR as an Integrative Psychotherapy Approach: Experts of Diverse Orientations Explore the Paradigm Prism* (pp. 57-83). American Psychological Association.
- van der Kolk, B. A. (2014). *The Body Keeps the Score: Brain, Mind and Body in the Healing of Trauma*. Viking.
- van der Kolk, B. A., Spinazzola, J., Blaustein, M. E., Hopper, J. W., Hopper, E. K., Korn, D. L., & Simpson, W. B. (2007). A randomized clinical trial of eye movement desensitization and reprocessing (EMDR), fluoxetine, and pill placebo in the treatment of posttraumatic stress disorder: Treatment effects and long-term maintenance. *Journal of Clinical Psychiatry*, 68(1), 37-46.
- van der Kolk, B. A., Wang, J. B., Yehuda, R., Bedrosian, L., Cooker, A., Harrison, C., Mithoefer, M., Yazar-Klosinski, B., Emerson, A., & Doblin, R. (2023). Self-experience in MDMA assisted therapy of PTSD. *medRxiv*, 2023.2001.2003.23284143. <https://doi.org/10.1101/2023.01.03.23284143>
- van der Kolk, B. A., Weisaeth, L., & van der Hart, O. (2007). History of Trauma in Psychiatry. In B. A. van der Kolk, A. C. McFarlane, & L. Weisaeth (Eds.), *Traumatic Stress: The Effects of Overwhelming Experience on Mind, Body, and Society* (pp. 47-74). Guilford Press. (1996)
- van der Meij, A., & de Vries, A. (Eds.). (2017). *Aansluiten: Over de intuïtieve cliëntbespreking* (2nd ed.). Nederlandse Vereniging van Antroposofische Zorgaanbieders.
- van der Veer, R. (1988). Een Vergeten Handelingspsycholoog: Pierre Janet. *Handelingen*, 2(2), 16-27.
- van Gelder, T. (2004). *Observing with twelve senses*. Louis Bolk Instituut.

- Varela, F. J., & Shear, J. (1999a). First-person Methodologies. What, Why, How? *Journal of Consciousness Studies*, 6(2-3), 1-14.
- Varela, F. J., & Shear, J. (Eds.). (1999b). *The View from Within: First-person Approaches to the Study of Consciousness*. Imprint Academic. (Journal of Consciousness Studies, 6, 2-3).
- Vignolo, M. (2007). Introduction. In M. Beaney, C. Penco, & M. Vignolo (Eds.), *Explaining the Mental. Naturalist and Non-Naturalist Approaches to Mental Acts and Processes* (pp. vi-xxxiv). Cambridge Scholars Publishing.
- Vijsselaar, J., & van der Hart, O. (1992). The First Report of Hypnotic Treatment of Traumatic Grief: A Brief Communication. *The International Journal of Clinical and Experimental Hypnosis*, XI(1), 1-6.
- Volchan, E., Rocha-Rego, V., Bastos, A. F., Oliveira, J. M., Franklin, C., Gleiser, S., Berger, W., Souza, G. G. L., Oliveira, L., David, I. A., Erthal, F. S., Pereira, M. G., & Figueira, I. (2017, 2017/05/01). Immobility reactions under threat: A contribution to human defensive cascade and PTSD. *Neuroscience & Biobehavioral Reviews*, 76, 29-38. <https://doi.org/10.1016/j.neubiorev.2017.01.025>
- Wachterhauser, B. R. (1999). *Beyond Being: Gadamer's Post-Platonic Hermeneutic Ontology*. Northwestern University Press.
- Wagemann, J. (2018). The Confluence of Perceiving and Thinking in Consciousness Phenomenology. *Frontiers in Psychology*, 8, Article 2313. <https://doi.org/10.3389/fpsyg.2017.02313>
- Wagemann, J., & Raggatz, J. (2021). First-person dimensions of mental agency in visual counting of moving objects. *Cognitive Processing*. <https://doi.org/10.1007/s10339-021-01020-x>
- Wagemann, J., & Weger, U. (2021). Perceiving the Other Self: An Experimental First-Person Account of Nonverbal Social Interaction. *American Journal of Psychology*(4), 441-461.
- Wais, M., & Gallé, I. (2008). *...der ganz alltägliche Missbrauch: Aus der Arbeit mit Opfern, Täter und Eltern* (2nd ed.). Mayer.
- Walker, M. (2017). *Why We Sleep: Unlocking the Power of Sleep and Dreams*. Scribner.
- Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2015). *The Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) – Past Month* [Measurement instrument]. National Center for PTSD. <http://www.ptsd.va.gov/>
- Weathers, F. W., Keane, T. M., & Davidson, J. R. (2001). The Clinician Administered PTSD Scale: A Review of the First Ten Years of Research. *Depression and Anxiety*, 13, 132-156. <https://doi.org/10.1002/da.1029>

- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013a). *The PTSD Checklist for DSM-5 (PCL-5) – Extended Criterion A* [Measurement instrument]. National Center for PTSD. <http://www.ptsd.va.gov>
- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013b). *The PTSD Checklist for DSM-5 (PCL-5) – LEC-5 and Extended Criterion A* [Measurement instrument]. National Center for PTSD. <http://www.ptsd.va.gov>
- Weber, S. (2019). Metamorphoses in the Development of the “I” from Birth to Age Fourteen. In S. Howard, P. Reubke, & M. Saar (Eds.), *Transitions in Childhood from Birth to 14 Years* (pp. 19-30). Waldorf Early Childhood Association of North America.
- Weger, U., & Herbig, K. (2020). The Self in the Periphery. *Review of General Psychology*, 25(1), 73-84. <https://doi.org/10.1177/1089268020954372>
- Weger, U., & Wagemann, J. (2015). The challenges and opportunities of first-person inquiry in experimental psychology. *New Ideas in Psychology*, 36, 38-49. <https://doi.org/10.1016/j.newideapsych.2014.09.001>
- Weger, U., Wagemann, J., & Meyer, A. (2018a). Introspection in Psychology: Its Contribution to Theory and Method in Memory Research. *European Psychologist*, 23(3), 206-216. <https://doi.org/10.1027/1016-9040/a000296>
- Weger, U., Wagemann, J., & Meyer, A. (2018b). Researching mind wandering from a first-person perspective. *Applied Cognitive Psychology*, 32, 298-306. <https://doi.org/10.1002/acp.3406>
- Weiss, D. S. (2004). The Impact of Event Scale-Revised. In J. P. Wilson & T. M. Keane (Eds.), *Assessing Psychological Trauma and PTSD* (2nd ed., pp. 168-189). Guilford Press.
- Wiehl, A., & Auer, W.-M. (Eds.). (2020). *Understanding Child Development: Rudolf Steiner's Essential Principles for Waldorf Education* (M. Saar, Trans.). Waldorf Early Childhood Association of North America.
- Williams, D. (1998). *Autism and Sensing: The Unlost Instinct*. Jessica Kingsley Publishers. <https://www.amzn.com/B00361FRWG>
- Williams, D. (n.d.). *Donna Williams*. Retrieved January 6, 2023 from <http://www.donnawilliams.net/index06cb.html?id=368>
- Williamson, T. (2002). *Knowldege and its Limits*. Oxford University Press. (2000)
- Wilson, S. A., Becker, L. A., & Tinker, R. H. (1997). Fifteen-Month Follow-Up of Eye Movement Desensitization and Reprocessing (EMDR) Treatment for Posttraumatic Stress Disorder and Psychological Trauma. *Journal of Consulting and Clinical Psychology*, 65(6), 1047-1056.
- Yang, H., Wang, L., Chengqi, C., Xing, C., Fang, R., Zhang, J., & D., E. J. (2017). The underlying dimensions of DSM-5 PTSD symptoms and their relation with anxiety and

depression in a sample of adolescents exposed to an explosion accident. *European journal of Psychotraumatology*, 8(1).
<https://doi.org/10.1080/20008198.2016.1272789>

Young, A. (1995). *The Harmony of Illusions: Inventing Post-Traumatic Stress Disorder*. Princeton University Press.

Ziegler, R., & Weger, U. (2018a). Exploring conceptual thinking and pure concepts from a first person perspective. *Phenomenology and the Cognitive Sciences*.
<https://doi.org/10.1007/s11097-018-9593-8>

Ziegler, R., & Weger, U. (2018b). First-Person Experiments in Thinking. *European Psychologist*. <https://doi.org/10.1027/1016-9040/a000301>

Zimbardo, P. G., & Gerrig, R. J. (1996a). Perception. In *Psychology and Life* (pp. 257-302). HarperCollins.

Zimbardo, P. G., & Gerrig, R. J. (1996b). *Psychology and Life* (14th ed.). HarperCollins.

Zimbardo, P. G., & Gerrig, R. J. (2002). Perception. In D. J. Levitin (Ed.), *Foundations of Cognitive Psychology: Core Readings* (pp. 133-188). MIT Press. (1996)

Zimbardo, P. G., Johnson, R. L., & McCann, V. (2017). *Psychology: Core Concepts* (8th ed.). Pearson.

Zimmerman, M. E. (1990). *Heidegger's Confrontation with Modernity. Technology, Politics, Art*. Indiana University Press.

Appendix 1

The nine phases occurring in extended connected breathing

Table A1

The nine phases that can occur during extended connected breathing

Phase	Label	Experience/Symptoms/Behavior
1	<i>Introduction</i>	Emerging bodily sensations (tingling, trembling, shaking, cramping, pain, cold, warmth, discomfort etc.) and/or emotions (fear, panic, anger, love, sadness, happiness, grief).
2	<i>Defense</i>	Urgency or dissociation; connected breathing exceedingly difficult to maintain.
3	<i>Immersion</i>	Surrender to/immersion in arising sensations/emotions; the breathing rhythm adapts to the experience.
4	<i>Inversion</i>	Inversion of consciousness from central to peripheral (the inversion itself is usually not experienced consciously).
5	<i>Association</i>	Succession of associated memories, immersion in some of them; REM.
6	<i>Insight/epiphany</i>	Sudden intuitive clarity about thought/belief embedded in the experience that wasn't fully processed; opening of 'inner space'; exhilaration; surge of energy; deep full breaths.
7	<i>Transliminal</i>	Transpersonal experiences – often (but not necessarily) in a state of profound relaxation that has the appearance of sleep.
8	<i>Deep relaxation</i>	Profound relaxation; possible short period of sleep; possible breath suspension (apnea); slow, relaxed breathing rhythm; REM.
9	<i>Return</i>	Return to the body, starting to move toes, feet, legs, fingers, hands, arms, head; opening of eyes; re-engaging with other(s).

Note. From “An Exploration of the Processing of Suppressed Memories During Rebirthing Breathwork,” by P. A. J. M de Wit, C. A. D. de Oliveira, R. V. d. L. Costa, R. M. Cruz, and C. B. Menezes, 2019, *Revista Brasileira de Psicoterapia*, 22(1), p. 75 (<https://doi.org/10.5935/2318-0404.20190005>). Copyright 2018 by P. A. J. M. de Wit.

Appendix 2

PCL-5 & LEC-5 with Extended Criterion A

PTSD CHECKLIST FOR THE DSM-5 AND LIFE EVENTS CHECKLIST FOR THE DSM-5 WITH EXTENDED A CRITERION

[PTSS Checklist voor de DSM-5 (PCL-5) en Life Events Checklist voor de DSM-5 (LEC-5) met uitgebreide A Criterium]

Versie 1.1

Naam: _____

ID-nr: _____

Studie: _____

Datum: _____

Disclaimer en Copyright: zie psychotraumadiagnostics.centrum45.nl

Originele tekst: Weathers, Litz, Keane, Palmieri, Marx, & Schnurr - National Center for PTSD (27/10/2013)

Huidige vertaling: Stichting Centrum '45, Arq Psychotrauma Expert Groep (23/07/2014)

Referentie:

Boeschoten, M.A., Bakker, A., Jongedijk, R.A. & Olf, M. (2014). PTSD Checklist for DSM-5 and Life Events Checklist for DSM-5 with extended A criterion– Nederlandstalige versie. Uitgave: Stichting Centrum '45, Arq Psychotrauma Expert Groep, Diemen.

LEC-5

Hieronder volgt een lijst van ingrijpende en/of stressvolle gebeurtenissen die mensen soms overkomen. Zet naast iedere gebeurtenis een of meerdere kruisje(s) om aan te geven dat: (a) het uzelf is overkomen; (b) u er getuige van was dat het iemand anders overkwam; (c) u er kennis van heeft genomen dat het een naast familielid of goede vriend van u is overkomen; (d) u ermee werd geconfronteerd in het kader van uw werk (zoals in het geval van ambulancepersoneel, politiemensen, militairen of andere eerstehulpverleners); (e) u niet zeker weet of dit op u van toepassing is; of (f) dit niet op u van toepassing is.

Denk terug aan uw hele leven (zowel toen u opgroeide als op volwassen leeftijd) terwijl u de lijst van gebeurtenissen doorloopt.

<i>Gebeurtenis</i>	<i>Mijzelf overkomen</i>	<i>Getuige geweest</i>	<i>Heb er kennis van genomen</i>	<i>In het kader van werk</i>	<i>Weet niet</i>	<i>Niet van toepassing</i>
1. Natuurramp (zoals een overstroming, orkaan, wervelwind of aardbeving)						
2. Brand of explosie						
3. Ongeval (zoals een auto-ongeluk, bootongeluk, treinongeluk of vliegtuigongeluk)						
4. Ernstig ongeluk op het werk, thuis of tijdens een vrijetijdsbesteding						
5. Blootstelling aan een giftige stof (zoals gevaarlijke chemicaliën of straling)						
6. Fysiek geweld (zoals aangevallen worden, een klap of dreun krijgen, geschopt worden, in elkaar geslagen worden)						
7. Geweld met gebruik van een wapen (zoals neergeschoten worden, gestoken worden, bedreigd worden met een mes, vuurwapen of bom)						
8. Seksueel geweld (verkrachting, poging tot verkrachting, gedwongen worden om een seksuele handeling te verrichten – van welke aard dan ook – door middel van geweld of bedreiging)						
9. Andere ongewenste of onaangename seksuele ervaringen						
10. Gewapende strijd of aanwezigheid in een oorlogsgebied (als militair of als burger)						
11. Gevangenschap (zoals ontvoerd worden, gegijzeld zijn of in krijgsgevangenschap verkeren)						

Deel 3: Hieronder volgt een lijst van problemen die mensen soms kunnen ondervinden na een zeer stressvolle gebeurtenis. Leest u alstublieft elke omschrijving aandachtig door terwijl u denkt aan uw meest ingrijpende gebeurtenis en omcirkel vervolgens één van de cijfers rechts van de beschrijving om aan te geven in hoeverre u er in de afgelopen maand last van heeft gehad.

<i>In hoeverre heeft u in de afgelopen maand last gehad van:</i>	<i>Helemaal niet</i>	<i>Een beetje</i>	<i>Matig</i>	<i>Nogal veel</i>	<i>Extreem veel</i>
1. Regelmatig terugkerende, onaangename en ongewenste herinneringen aan de stressvolle gebeurtenis?	0	1	2	3	4
2. Regelmatig terugkerende, onaangename dromen over de stressvolle gebeurtenis?	0	1	2	3	4
3. Opeens het gevoel hebben of u gedragen alsof de stressvolle gebeurtenis daadwerkelijk opnieuw plaatsvindt (alsof u terug bent in de tijd dat de gebeurtenis zich afspeelde, en het opnieuw beleeft)?	0	1	2	3	4
4. Erg van streek raken wanneer iets u aan de stressvolle gebeurtenis herinnert?	0	1	2	3	4
5. Een sterke lichamelijke reactie hebben wanneer iets u aan de stressvolle gebeurtenis herinnert (bijvoorbeeld: hartkloppingen, moeite met ademen, zweten)?	0	1	2	3	4
6. Het vermijden van herinneringen, gedachten of gevoelens die verband houden met de stressvolle gebeurtenis?	0	1	2	3	4
7. Het vermijden van dingen die herinneringen zouden kunnen oproepen aan de stressvolle gebeurtenis (bijvoorbeeld: bepaalde mensen, plekken, gespreksonderwerpen, activiteiten, voorwerpen of situaties)?	0	1	2	3	4
8. Moeite hebben met het herinneren van belangrijke delen van de stressvolle gebeurtenis?	0	1	2	3	4
9. Sterke, negatieve overtuigingen hebben met betrekking tot uzelf, anderen of de wereld (bijvoorbeeld gedachten hebben zoals: ik ben slecht, er is iets vreselijk mis met mij, niemand is te vertrouwen, de wereld is door en door gevaarlijk)?	0	1	2	3	4
10. De schuld geven aan uzelf of aan anderen voor de stressvolle gebeurtenis of de gevolgen daarvan?	0	1	2	3	4
11. Sterke, negatieve gevoelens ervaren zoals angst, afschuw, boosheid, schuld of schaamte?	0	1	2	3	4
12. Verminderde interesse hebben in activiteiten die u eerder graag deed?	0	1	2	3	4
13. Afstand voelen tussen uzelf en andere mensen, of u vervreemd voelen van andere mensen?	0	1	2	3	4
14. Moeite hebben om positieve gevoelens te ervaren (bijvoorbeeld: niet in staat zijn om u gelukkig te voelen of om gevoelens van liefde te hebben voor de mensen die u nabij zijn)?	0	1	2	3	4
15. Prikkelbaarheid, woedeaanvallen, of u agressief gedragen?	0	1	2	3	4
16. Teveel risico's nemen of dingen doen die u schade zouden kunnen toebrengen?	0	1	2	3	4
17. "Superalert", waakzaam of op uw hoede zijn?	0	1	2	3	4
18. U nerveus voelen of snel schrikken?	0	1	2	3	4
19. Moeite hebben met concentreren?	0	1	2	3	4
20. Moeite hebben met inslapen of doorslapen?	0	1	2	3	4

Appendix 3

Instructies voor het waarnemen van ervaringen van traumaverwerking

Doel van dit onderzoek is het in kaart brengen van de innerlijke processen die plaatsvinden tijdens het verwerken van traumatische herinneringen. Als deelnemer wordt u gevraagd een behandeldagboek bij te houden, met name gedurende het deel van de therapie waar het belangrijkste deel van de traumaverwerking plaatsvindt. De verwachting is dat dit zich zal concentreren in een periode van één tot vier therapie sessies. Wanneer u en uw behandelaar denken dat deze fase van de therapie is begonnen wordt u gevraagd na iedere sessie uw ervaringen tijdens de sessie die betrekking hadden op het trauma en de verwerking ervan zo nauwkeurig mogelijk vast te leggen in uw behandeldagboek. Dit kan aan het eind van de sessie of later thuis. Wel wordt u verzocht indien mogelijk dit liefst nog dezelfde dag te doen, zodat uw herinnering aan de ervaringen nog zo fris mogelijk is. Ook wordt u verzocht om ervaringen die u tussen de sessies heeft en waarvan u denkt dat ze met de traumaverwerking te maken hebben in uw dagboek vast te leggen. Dit kunnen ook dromen zijn die u in deze periode heeft. U mag uw ervaringen van de traumaverwerking in woorden beschrijven, maar u mag het ook beeldend doen in de vorm van tekeningen, schema's, schilderijen etc. Deze keuze is vrij en u mag ook zowel woord als beeld gebruiken voor het vastleggen van uw ervaringen.

Wat voor soort ervaringen worden bedoeld met “ervaringen die met het verwerken van trauma te maken hebben”? Dat weet u waarschijnlijk zelf het beste wanneer het zover is, maar om u op weg te helpen volgt hier een lijst met mogelijke soorten ervaringen die met het verwerken van trauma te maken kunnen hebben:

1. Ervaringen die met zintuigindrukken te maken hebben terwijl u beseft dat het niet zintuigindrukken zijn van gebeurtenissen die nu plaatsvinden. Hierbij kunt u denken aan visuele flashbacks, maar ook aan indrukken die met andere zintuigen te maken hebben (geluid, smaak, geur, tast, warmte/kou, etc.).
2. Lichamelijke ervaringen (trillen, schudden, warm of koud worden, stijf worden (zich plotseling niet meer kunnen bewegen), kramp, een sterke behoefte om een bepaalde beweging te maken of een bepaalde houding aan te nemen, etc.)
3. Sterke gevoelens (bijvoorbeeld van onmacht, angst, woede, bedroefdheid, schuld; maar ook vreugde, euforie, een gevoel van overwinning, etc.).
4. Het gevoel alsof u weer in de traumatische gebeurtenis bent, of een herinnering aan een andere gebeurtenis in uw leven die u vergeten was, maar die nu plotseling helder voor u staat.

5. Het versterkt voelen van een negatief oordeel of gevoel over uzelf.
6. Dromen.
7. Plotselinge inzichten over uzelf.
8. Het zich bewust worden van een overtuiging, een oordeel, of een gedachte over uzelf, over anderen, over het leven, of over de wereld, waarvan u zich realiseert dat het een overtuiging (of een oordeel, of een gedachte) is, maar waarvan u tot nu toe dacht dat het “gewoon zo was” (dus dat het een feit was waar u niets aan kon veranderen).
9. Buitengewone ervaringen die u normaal, tijdens het dagelijks leven niet heeft. Bijvoorbeeld spirituele ervaringen, of ervaringen dat u contact maakt met een deel van uzelf waarvan u zich tot nu toe nooit bewust was, etc.

Nogmaals, dit is een lijst met mogelijke soorten ervaringen die met het verwerken van trauma te maken kunnen hebben. Mocht u een ervaring hebben die u niet in een categorie kunt plaatsen van de ervaringen die in deze lijst zijn genoemd dan wordt u verzocht ook zulke ervaringen op te tekenen.

U wordt verzocht wanneer u een ervaring beschrijft, deze zo nauwkeurig mogelijk vast te leggen, dus: wat zag u precies, wat voelde u, wat dacht u, welk inzicht had u en hoe voelde u zich daarover. Wij verzoeken u uw ervaringen zo min mogelijk te beoordelen en zoveel mogelijk als een onbevangen waarnemer weer te geven. Echter, wanneer u kiest voor een beeldende weergave hoeft u zich hier *niet* aan te houden. Dan kunt u, wanneer u dat wilt, juist uw kunstzinnig gevoel, of gevoel voor symboliek volgen en hoeft de afbeelding dus geen objectieve weergave te zijn van hetgeen u heeft beleefd. Dat *mag* wel, maar het *hoeft* niet. U mag juist uw gevoel en uw vermogen om te symboliseren de ruimte geven. Hetzelfde geldt voor een kunstzinnige *woordelijke* weergave, dus bijvoorbeeld in de vorm van een gedicht, een sprookje of een andere symbolische verbale uitdrukking.

Tenslotte, misschien vindt u het moeilijk om iets op te schrijven en neemt u liever de beschrijving van uw ervaringen als gesproken woord op. Dit kan uitstekend wanneer uw mobiele telefoon een opnamefunctie heeft. Mocht u hiervoor kiezen, neem dan eerst even contact op met uw behandelaar of met de onderzoeker. Ook bij andere vragen over het waarnemen kunt u contact opnemen met de onderzoeker (Paul de Wit, 0651975321, pdwpsi@gmail.com).

Appendix 4

Informatiebrief en toestemmingsformulier voor deelnemers versie 1 / 15 maart 2022

Informatie voor deelname aan medisch-wetenschappelijk onderzoek

De Innerlijke ervaring van traumaverwerking

Officiële titel: The Inner Experience of Trauma Processing

Inleiding

Geachte heer/mevrouw,

Met deze informatiebrief willen we u vragen of u wilt meedoen aan medisch-wetenschappelijk onderzoek. Meedoen is vrijwillig. U krijgt deze brief omdat u onder behandeling bent, of binnenkort onder behandeling gaat voor psychologisch trauma en uw behandelaar u heeft voorgedragen voor dit onderzoek. U leest hier om wat voor onderzoek het gaat, wat het voor u betekent, en wat de voordelen en nadelen zijn. Het is veel informatie. Wilt u de informatie doorlezen en beslissen of u wilt meedoen? Als u wilt meedoen, kunt u het formulier invullen dat u vindt in bijlage B.

Stel uw vragen

U kunt uw beslissing nemen met de informatie die u in deze informatiebrief vindt. Daarnaast raden we u aan om dit te doen:

- Stel vragen aan de onderzoeker die u deze informatie geeft.
- Praat met uw partner, familie of vrienden over dit onderzoek.
- Stel vragen aan de onafhankelijk deskundige, [naam].
- Lees de informatie op www.rijksoverheid.nl/mensenonderzoek.

1. 1. Algemene informatie

Drs. P.A.J.M. de Wit heeft dit onderzoek opgezet als onderdeel van zijn promotieonderzoek. Hij is "de onderzoeker" en is als promovendus verbonden aan de Federale Universiteit van Santa Catarina in Brazilië. Hij woont en werkt in Nederland. Hieronder noemen we P.A.J.M. de Wit steeds de 'opdrachtgever'. De onderzoeker voert het onderzoek uit in Queeste in Alkmaar.

Er zullen naar verwachting zo'n 12 deelnemers aan dit onderzoek meedoen.

2. Wat is het doel van het onderzoek?

In dit onderzoek bestuderen we de innerlijke ervaringen die cliënten hebben wanneer ze traumatische herinneringen verwerken tijdens hun behandeling.

3. 3. Wat is de achtergrond van het onderzoek?

Er zijn verschillende ideeën over wat traumaverwerking inhoudt. De meeste van die ideeën hebben met de hersenen en het zenuwstelsel te maken. Die ideeën zijn eigenlijk nog nooit goed onderzocht. In dit onderzoek zijn we niet zozeer geïnteresseerd in wat er in de hersenen gebeurt, maar in hoe die verwerking door iemand die zijn of haar trauma aan het verwerken is ervaren wordt. De onderzoekers denken dat we door het bestuderen van die ervaringen ook belangrijke inzichten over het verwerken van trauma kunnen krijgen.

3. 4. Hoe verloopt het onderzoek?

Hoelang duurt het onderzoek?

Doet u mee met het onderzoek? Dan duurt dat in totaal twee tot acht weken.

Stap 1: bent u geschikt om mee te doen?

We willen eerst weten of u geschikt bent om mee te doen. Daarom is het mogelijk dat uw behandelaar u eerst twee vragenlijsten in laat vullen. Deze vragenlijsten vragen naar de traumatische gebeurtenis(sen) waarbij u betrokken bent geweest en naar de dingen waar u na die gebeurtenis(sen) last van heeft. Het invullen van deze vragenlijsten duurt tussen twintig minuten en drie kwartier.

Stap 2: onderzoek

U begint (of gaat door) met uw behandeling bij Queeste. Wanneer u tijdens uw behandeling uw traumatische ervaringen aan het verwerken bent wordt u door uw behandelaar gevraagd na afloop van de sessie uw innerlijke ervaringen tijdens de sessie op te schrijven, of er een afbeelding (bijvoorbeeld een tekening of schildering) van te maken. U mag ook beiden doen (in woorden beschrijven *en* afbeelden). Ook wordt u gevraagd om ervaringen zoals dromen die tussen de betreffende sessies plaatsvinden te beschrijven en/of af te beelden. De verwachting is dat de ervaringen waar het hier om gaat zich voordoen gedurende 1 tot 4 behandelingsessies. We verwachten bovendien dat het u tussen een half uur en een uur per sessie kost om deze ervaringen te beschrijven en/of af te beelden. Daarom is de verwachting dat u er totaal tussen een half uur en acht uur aan kwijt zult zijn. Nadat dit gedeelte van de behandeling klaar is is er ook nog een gesprek met de onderzoeker om uw beschrijvingen en/of afbeeldingen te bespreken en eventuele onduidelijkheden te verhelderen. Als u wilt is uw behandelaar hier ook bij. Dit gesprek duurt een uur tot anderhalf uur.

Stap 3: nacontrole

Vóór het gesprek met de onderzoeker zal de behandelaar u nogmaals een vragenlijst in laten vullen. Dit is één van de vragenlijsten die u ook vóór het onderzoek al in heeft gevuld. Het invullen van deze vragenlijst duurt 10 tot 15 minuten.

Wat is er anders dan bij gewone zorg?

U ontvangt uw gewone zorg. Daarnaast beschrijft u na afloop van enkele behandelingen wat u tijdens de behandeling beleefde. Verder zal er ook een gesprek met de onderzoeker plaatsvinden over wat u heeft opgeschreven of heeft afgebeeld. Ook vult u voor en tijdens de behandeling enkele vragenlijsten in. Na het gesprek met de onderzoeker gaat uw gewone behandeling verder en hoeft u verder niets meer voor het onderzoek te doen.

5. Welke afspraken maken we met u?

We willen graag dat het onderzoek goed verloopt. Daarom maken we de volgende afspraken met u:

- U probeert de ervaringen die u tijdens de betreffende behandelingen had zo goed mogelijk te beschrijven en/of af te beelden op de manier die uw behandelaar u heeft uitgelegd en die door de onderzoeker is beschreven.
- U neemt contact op met de onderzoeker in deze situaties:
 - o U heeft vragen over wat u moet doen tijdens het onderzoek
 - o U wilt niet meer meedoen met het onderzoek.
 - o Uw telefoonnummer, adres of e-mailadres verandert.

6. Van welke bijwerkingen, nadelige effecten of ongemakken kunt u last krijgen?

Het nadenken en rapporteren over uw ervaringen tijdens de behandeling kan de gevoelens die de behandeling bij u oproept nogmaals onder uw aandacht brengen. Voor zover dit gevoelens betreft die u lastig vindt, kan dit als ongemak ervaren worden. Verder brengt deelname aan het onderzoek, voor zover bekend, geen bijwerkingen, nadelige effecten of ongemakken met zich mee.

7. Wat zijn de voordelen en de nadelen als u meedoet aan het onderzoek?

Meedoen aan het onderzoek kan voordelen en nadelen hebben. Hieronder zetten we ze op een rij. Denk hier goed over na, en praat erover met anderen.

Zoals in paragraaf 6 vermeld kan nadenken en rapporteren over uw ervaringen tijdens de behandeling de gevoelens die de behandeling bij u oproept nogmaals onder uw aandacht brengen. Behalve dat dit als ongemak ervaren kan worden, kan het ook een positief effect hebben. Ten eerste kunnen de gevoelens positief zijn; en ten tweede kan nogmaals stilstaan bij wat er tijdens de behandeling is gebeurt het effect van de behandeling versterken. Verder kan meedoen aan dit onderzoek de onderzoekers helpen meer inzicht te krijgen in de behandeling van traumatische herinneringen.

Meedoen aan het onderzoek kan deze nadelen hebben:

- - U kunt last krijgen van de nadelige effecten of ongemakken, zoals beschreven in paragraaf 6.
- - Meedoen aan het onderzoek kost u extra tijd.
- - U moet zich houden aan de afspraken die horen bij het onderzoek.

Wilt u niet meedoen?

U beslist zelf of u meedoet aan het onderzoek. Wilt u niet meedoen? Dan krijgt u van uw behandelaar de gewone behandeling voor trauma.

8. Wanneer stopt het onderzoek?

De onderzoeker laat het u weten als er nieuwe informatie over het onderzoek komt die belangrijk voor u is. De onderzoeker vraagt u daarna of u blijft meedoen.

In deze situaties stopt voor u het onderzoek:

- Alle onderzoeken volgens het schema zijn voorbij.
- U wilt zelf stoppen met het onderzoek. Dat mag op ieder moment. Meld dit dan meteen bij de onderzoeker. U hoeft er niet bij te vertellen waarom u stopt. Uw behandeling gaat in dat geval gewoon door.
- De behandelaar vindt het beter voor u om te stoppen.
- Een van de volgende instanties besluit dat het onderzoek moet stoppen:
 - o P. A. J. M. de Wit (de onderzoeker)
 - o de overheid, of
 - o de medisch-ethische commissie die het onderzoek beoordeelt.

Wat gebeurt er als u stopt met het onderzoek?

De onderzoeker gebruikt de gegevens die tot het moment van stoppen door u zijn vastgelegd. Als u wilt, kunt u ervoor kiezen de door u vastgelegde gegevens niet met de onderzoeker te delen. Indien u besluit zich na afloop van het onderzoek alsnog terug te trekken dan kunt u verzoeken alle door u verstrekte informatie te laten vernietigen mits deze informatie nog niet verwerkt en gepubliceerd is. Geef dit door aan de onderzoeker.

9. Wat gebeurt er na het onderzoek?

Krijgt u de resultaten van het onderzoek?

Ongeveer zes maanden na uw deelname laat de onderzoeker u weten wat de belangrijkste uitkomsten zijn van het onderzoek. Wilt u dit niet weten? Zeg dat dan tegen de onderzoeker. Hij zal het u dan niet vertellen.

10. Wat doen we met uw gegevens?

Doet u mee met het onderzoek? Dan geeft u ook toestemming om uw gegevens te verzamelen, gebruiken en bewaren.

Welke gegevens bewaren we?

We bewaren deze gegevens :

- uw naam

- uw geslacht
- uw adres
- uw geboortedatum
- gegevens over uw gezondheid
- de gegevens die we tijdens het onderzoek verzamelen
- de gegevens die u tijdens het onderzoek met ons deelt

Waarom verzamelen, gebruiken en bewaren we uw gegevens?

We verzamelen, gebruiken en bewaren uw gegevens om de vragen van dit onderzoek te kunnen beantwoorden. En om de resultaten te kunnen publiceren.

Hoe beschermen we uw privacy?

Om uw privacy te beschermen geven wij uw gegevens een code. Op al uw gegevens zetten we alleen deze code. De sleutel van de code bewaren we op een beveiligde plek in het Centraal Bureau van de Raphaëlstichting. Als we uw gegevens verwerken, gebruiken we steeds alleen die code. Ook in rapporten en publicaties over het onderzoek kan niemand terughalen dat het over u ging.

Wie kunnen uw gegevens zien?

Sommige personen kunnen wel uw naam en andere persoonlijke gegevens zonder code inzien. Dit zijn mensen die controleren of de onderzoekers het onderzoek goed en betrouwbaar uitvoeren. Deze personen kunnen bij uw gegevens komen:

- Leden van de commissie die de veiligheid van het onderzoek in de gaten houdt.
- Nationale en internationale toezichhoudende autoriteiten. Bijvoorbeeld de Inspectie Gezondheidszorg en Jeugd.

Deze personen houden uw gegevens geheim. Wij vragen u voor deze inzage toestemming te geven.

Hoelang bewaren we uw gegevens en lichaamsmateriaal?

We bewaren uw gegevens 5 jaar in het Centraal Bureau van de Raphaëlstichting. En 5 jaar bij de opdrachtgever.

Kunt u uw toestemming voor het gebruik van uw gegevens weer intrekken?

U kunt uw toestemming voor het gebruik van uw gegevens op ieder moment intrekken. Maar let op: trekt u uw toestemming in, en hebben onderzoekers dan al gegevens gepubliceerd over het onderzoek? Dan mogen zij deze gegevens nog wel gebruiken.

Wilt u meer weten over uw privacy?

- Wilt u meer weten over uw rechten bij de verwerking van persoonsgegevens? Kijk dan op www.autoriteitpersoonsgegevens.nl.

- Heeft u vragen over uw rechten? Of heeft u een klacht over de verwerking van uw persoonsgegevens? Neem dan contact op met degene die verantwoordelijk is voor de verwerking van uw persoonsgegevens. Voor uw onderzoek is dat:
 - o P.A.J.M. de Wit of Maurits van Raaphorst Zie bijlage A voor contactgegevens.
- Als u klachten heeft over de verwerking van uw persoonsgegevens, raden we u aan om deze eerst te bespreken met het onderzoeksteam. U kunt ook naar de Functionaris Gegevensbescherming van de Raphaëlstichting gaan. Of u dient een klacht in bij de Autoriteit Persoonsgegevens.

Waar vindt u meer informatie over het onderzoek?

U kunt contact opnemen met P. A. J. M. de Wit (pdwpsi@gmail.com) voor meer informatie over het onderzoek.

a. 11. Krijgt u een vergoeding als u meedoet aan het onderzoek?

De onderzoeksmiddelen voor het onderzoek kosten u niets. U krijgt ook geen vergoeding als u meedoet aan dit onderzoek. Wel krijgt u een vergoeding voor uw (extra) reiskosten.

a. 12. Bent u verzekerd tijdens het onderzoek?

U bent niet extra verzekerd voor dit onderzoek. Want als u meedoet aan het onderzoek heeft u dezelfde risico's als bij de gewone behandeling van uw trauma. Daarom hoeft de onderzoeker van de medisch ethische toetsingscommissie (Leiden, Den Haag, Delft) geen extra verzekering af te sluiten.

a. 13. We informeren uw behandelend specialist

Dit onderdeel is op dit onderzoek niet van toepassing. Uw behandelaar is reeds op de hoogte van uw deelname aan het onderzoek.

a. 14. Heeft u vragen?

Vragen over het onderzoek kunt u stellen aan P. A. J. M. de Wit. Wilt u advies van iemand die er geen belang bij heeft? Ga dan naar Clemens Dijkstra (GZ-psychooloog bij de Raphaëlstichting). Hij weet veel over het onderzoek, maar werkt niet mee aan dit onderzoek.

Heeft u een klacht? Bespreek dit dan met de onderzoeker of uw behandelaar bij Queeste. Wilt u dit liever niet? Ga dan naar klachtenfunctionaris van de Raphaëlstichting. In bijlage A staat waar u die kunt vinden.

a. 15. Hoe geeft u toestemming voor het onderzoek?

U kunt eerst rustig nadenken over dit onderzoek. Daarna vertelt u de onderzoeker of u de informatie begrijpt en of u wel of niet wilt meedoen. Wilt u meedoen? Dan vult u het toestemmingsformulier in dat u bij deze

informatiebrief vindt. U en de onderzoeker krijgen allebei een getekende versie van deze toestemmingsverklaring.

Dank voor uw tijd.

16. Bijlagen bij deze informatie

- A. Contactgegevens
- B. Toestemmingsformulier

Bijlage A: contactgegevens voor Raphaëlstichting

Onderzoeker:

P.A.J.M. de Wit

Telefoon: 0651975321

pdwpsi@gmail.com

Onafhankelijk deskundige:

Clemens Dijkstra, GZ-psycholoog,

Telefoon: 072-5099470 (woensdag)

c.dijkstra@scorlewald.nl

Klachten:

Centraal Bureau Raphaëlstichting

Secretariaat Klachtencommissie Cliënten

Postbus 28

1870 AA SCHOORL

Telefoon: 072 – 5099000

secretariaat@raphaelstichting.nl

Functionaris voor de Gegevensbescherming van de instelling:

Maurits van Raaphorst

informatiebeveiliging@raphaelstichting.nl

Bijlage B: toestemmingsformulier deelnemer

Behorende bij

De innerlijke ervaring van traumaverwerking

- - Ik heb de informatiebrief gelezen. Ook kon ik vragen stellen. Mijn vragen zijn goed genoeg beantwoord. Ik had genoeg tijd om te beslissen of ik meedoe.
- - Ik weet dat meedoen vrijwillig is. Ook weet ik dat ik op ieder moment kan beslissen om toch niet mee te doen met het onderzoek. Of om ermee te stoppen. Ik hoef dan niet te zeggen waarom ik wil stoppen.
- - Ik geef de onderzoekers toestemming om mijn gegevens te verzamelen en gebruiken. De onderzoekers doen dit alleen om de onderzoeksvraag van dit onderzoek te beantwoorden.
- - Ik weet dat voor de controle van het onderzoek sommige mensen al mijn gegevens kunnen inzien. Die mensen staan in deze informatiebrief. Ik geef deze mensen toestemming om mijn gegevens in te zien voor deze controle.
- - Wilt u hieronder ja of nee aankruisen?

Ik geef toestemming om mijn gegevens te bewaren om dit te gebruiken voor ander onderzoek, zoals in de informatiebrief staat.	Ja <input type="checkbox"/>	Nee <input type="checkbox"/>
--	-----------------------------	------------------------------

- - Ik wil meedoen aan dit onderzoek.

Mijn naam is (deelnemer):

Handtekening:

Datum : __ / __ / __

Ik verklaar dat ik deze deelnemer volledig heb geïnformeerd over het genoemde onderzoek.

Wordt er tijdens het onderzoek informatie bekend die die de toestemming van de deelnemer kan beïnvloeden?
Dan laat ik dit op tijd weten aan deze deelnemer.

Naam onderzoeker (of diens vertegenwoordiger):.....

Handtekening:.....

Datum: __ / __ / __

De deelnemer krijgt een volledige informatiebrief mee, samen met een getekende versie van het toestemmingsformulier

Appendix 5

John Hughlings Jackson's framework of cerebral localization

The conceptual framework for clinical neurophysiology developed in the second half of the nineteenth century by John Hughlings Jackson still forms an important basis for neurology (e.g. Chirimuuta, 2017; Critchley & Critchley, 1998). A basic understanding of Hughlings Jackson's conceptual framework is not only important to understand several of the neurophysiological models that will be presented in this study, certain concepts used by Hughlings Jackson can also be recognized in psychodynamic trauma models (particularly in Janet's dissociation model). To make sure that the reader has a rudimentary understanding of Hughlings Jackson's framework I have chosen to precede the exploration of trauma models of the nineteenth and twentieth century with a brief summary of Hughlings Jackson's conceptual framework. For a more elaborate, yet concise introduction to John Hughlings Jackson I refer the interested reader to "An Introduction to the Life and Work of John Hughlings Jackson: Introduction" (York & Steinberg, 2007). In his chapter "Representation and Mental Mechanisms", William Bechtel also gives a good introduction to Hughlings Jackson's use of the concept of representation (Bechtel, 2008). The present summary is largely based on York & Steinberg's introduction, while for further clarification short excerpts from Hughlings Jackson's lectures on "Evolution and Dissolution of the Nervous System" are used (Hughlings Jackson, 1884a, 1884b, 1884c).

During his study of epilepsy in the 1860s, John Hughlings Jackson (1835–1911) realized that during epileptic seizures some symptoms indicated that different areas of the body must be linked to specific areas of the brain, while other symptoms indicated that the representation of the body was uniformly spread over the higher regions of the brain. Combining his clinical observations with the conception of evolution developed by the English philosopher Herbert Spencer (1820–1903), Hughlings Jackson came to conceive of a model for the mapping of the different areas of the body on the brain that wasn't simply linear and one-dimensional, but that involved several levels and gradations. Through systematic observation and logical induction he developed an ingenious framework that could be used by clinicians for the diagnosis of neurological disorders and that came to form the foundation of modern neurology.

Hughlings Jackson's framework of cerebral localization is based on four main postulates. These postulates are:

- I. The nervous system is a *sensori-motor machine*;

- II. The representation of the impressions from and the representation of movement of different areas of the body in the nervous system is organized in a *weighted hierarchical fashion*;
- III. Nervous centers are organized in an *anatomical hierarchy*, and the relationship between the different levels in this hierarchy is based on *evolutionary principles*. Higher nervous centers inhibit functions regulated by evolutionary lower centers. Neurological disorders can lead to de-evolution, or *dissolution* of this organization;
- IV. The mind and the nervous system are strictly *parallel phenomena*, there is no causal interaction between them.

In the following sections I will briefly elaborate on these four postulates, which form the four main components of Hughlings Jackson's framework—the emphasis will be on the second and third postulate.

I. The nervous system as sensori-motor machine

The first component of Hughlings Jackson's framework is the doctrine that the nervous system is “a sensori-motor machine, a co-ordinating system from top to bottom” (Hughlings Jackson cited in York & Steinberg, 2007, p. 17). Contrary to many of his contemporaries, Hughlings Jackson considered the nervous system a soulless, purely physical mechanism – a “machine” – on which non-material factors have no influence. According to this doctrine, neither volition, nor thoughts or emotions can cause behavior.

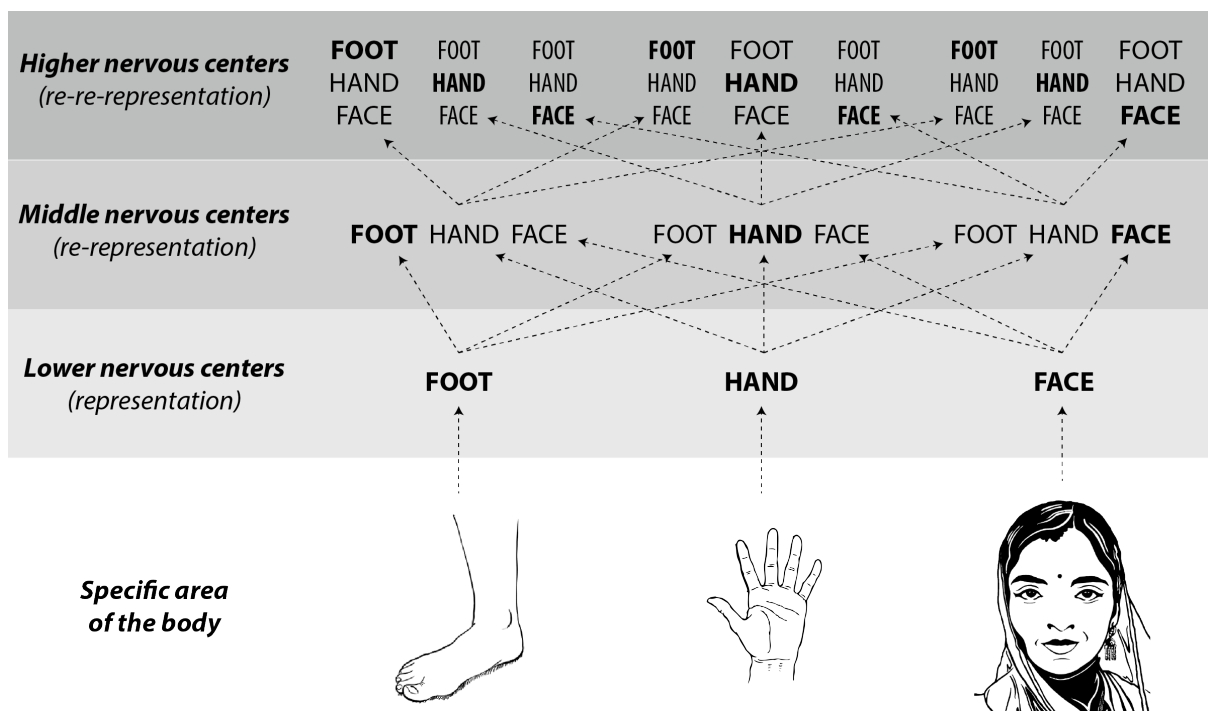
II. The principle of weighted ordinal representation

The second component in Hughlings Jackson's framework is the principle of *weighted ordinal representation*. Hughlings Jackson realized that the different areas of the body could not just be mapped to different areas of the nervous system in a one-dimensional way. The way in which focal seizures manifest in the body suggests such one-dimensional mapping, but one-dimensional mapping leads to contradictions when trying to explain certain forms of paralysis and other global seizure-related phenomena. In short, certain observations involving paralysis seem to indicate that every muscle (and by extrapolation every part of the body) has to be represented in *every* part of the nervous system, while observations involving focal seizures indicate that different muscles (and hence different parts of the body), have to be represented in *discrete* parts of the nervous system. Hughlings Jackson solved this apparent contradiction by combining two ideas (see Figure A1). First, he asserted that although impressions from and movements of all areas of the body are represented in every part of the nervous system, this representation has to be *weighted* – specific areas in the body

have a stronger (or “special”) representation in specific parts of the nervous system, while at the same time also being represented in the rest of the nervous system, but not as strongly. Secondly, he proposed that the nervous system is organized hierarchically and that there are three overall levels in this anatomical hierarchy. He called these overall levels the *lower*, *middle* and *higher* sensorimotor centers. Anatomically lower centers are less complex, but more organized, while anatomically higher centers are less organized, yet more complex⁶² (Hughlings Jackson, 1884a).

Figure A1

Hughlings Jackson model of weighted ordinal representation



Note. A schematic representation of Hughlings Jackson’s model of weighted ordinal representation of areas of the body (foot, hand and face) in the lower, the middle and the higher nervous centers. Although all areas of the body are (re)-re-represented in all middle and higher centers of the brain, this (re)-re-representation is weighted (indicated here by bold, not-condensed fonts). The three main columns represent different areas in the brain. Copyright 2019 by P. A. J. M. de Wit.

⁶² From a modern neuromorphological point of view Hughlings Jackson’s qualifications *less complex* and *more organized* mean that the neurons in the lower centers have (more or less) direct connections with sensory or motor organs in the body, while *more complex* and *less organized* mean that the neurons in the higher centers have multitudinous connections with other neurons (forming complex neural networks), but have no direct connections with sensory or motor organs. Hughlings Jackson equates direct, simple connections with being “well organized” (Hughlings Jackson, 1884a), stressing that higher centers cannot be highly organized, because this would not allow for new forms of organization required by more specialized, voluntary actions. Thus, *least organized* implies highly modifiable, whereas *most organized* implies (almost) not modifiable (Hughlings Jackson 1884c).

Furthermore, individual middle and higher centers form representations of the representations formed in centers on the next lower level. Thus, taking the lower centers as an example, these lower centers, being the most organized (more or less directly connected), represent impressions and movements related to specific parts of the body (third row in Figure A1). The representations of these lower centers are represented in the less organized, more complex middle centers and *re-represented* in the least organized, most complex higher centers. As the lower centers already represent the impressions coming from and the movements of specific areas in the body, these representations are therefore *re-represented* in the middle centers and *re-re-represented* in the higher centers of the nervous system. As these (re-re)-representations are also weighted (as explained above), the combination of these two concepts (weight and level) results in the rather complex model of *weighted ordinal representation* (indicated by bold and not-condensed fonts in Figure A1). Complex though it is, this model was able to resolve the apparent contradictions encountered in the physical manifestations of both global and local symptoms observed during epileptic seizures.

III. Evolution-based hierarchical organization

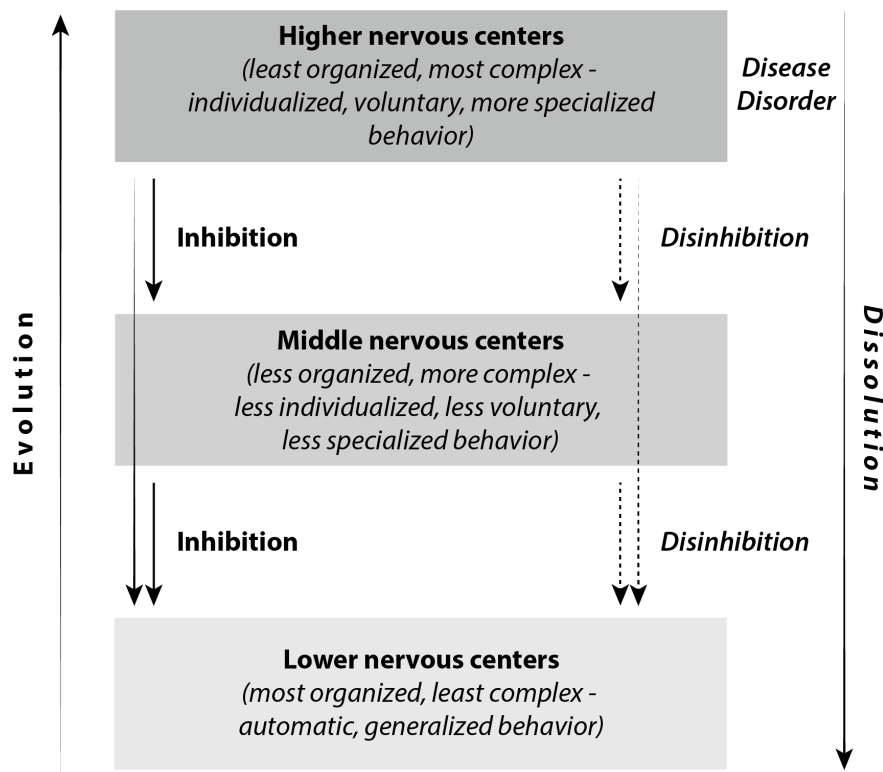
The third component adds the concept of *evolution* to the hierarchically organized centers of the second component. Hughlings Jackson proposed that the relationship between the hierarchical centers of the nervous system is based on evolutionary principles. The higher centers are believed to have evolved out of the lower centers. Hughlings Jackson associated the higher centers with individualized, voluntary, more specialized, thus higher evolved behavior, and the lower centers with automatic, generalized, less evolved behavior. In order to make higher evolved behavior possible, less evolved behavior associated with the lower centers has to be inhibited. Hughlings Jackson believed that the higher nervous centers were responsible for the inhibition of the behavior associated with the lower centers:

The doctrine of evolution implies the passage from the most organised to the least organised, or, in other terms, from the most general to the most special. Roughly, we say that there is a gradual ‘adding on’ of the more and more special, a continual adding on of new organisations. But this ‘adding on’ is at the same time a ‘keeping down’. (Hughlings Jackson, 1884b, p. 662)

When nervous centers are affected by a disease or disorder, the relationships between the different hierarchical levels can be affected. This can lead to what Hughlings Jackson termed *de-evolution* (reverse evolution), or *dissolution* (see Figure A2).

Figure A2

Hughlings Jackson's evolution-based hierarchical model of the central nervous system



Note. In a healthy individual the higher nervous centers inhibit the behavior associated with the lower centers. Dissolution of higher centers through disease or disorder leads to disinhibition of lower nervous centers and results in behavior associated with these centers. Copyright 2019 by P. A. J. M. de Wit.

Hughlings Jackson observed that when higher centers were affected by dissolution this leads to two types of symptoms; he called these negative and positive symptoms. Negative symptoms involve the dissolution of the higher centers and mean a loss of complex, voluntary behavior, while positive symptoms involve the disinhibition of lower centers and the resulting emergence of less specialized, involuntary behavior.

The higher nervous arrangements evolved out of the lower keep down those lower, just as a government evolved out of a nation controls as well as directs that nation. If this be the process of evolution, then the reverse process of dissolution is not only a “taking off” of the higher, but is at the very same time a “letting go” of the lower. If the governing body of this country were destroyed suddenly, we should have two causes for lamentation: (1) the loss of services of eminent men; and (2) the anarchy of the now uncontrolled people. The loss of the governing body answers to the dissolution in our patient (the exhaustion of the highest two layers of his highest

centres); the anarchy answers to the no longer controlled activity of the next lower level of evolution (third layer). (Hughlings Jackson, 1884b, p. 662)

Notably, as the highest centers are “least organised, [they] ‘give out’ first and most; the middle centres, being more organised, resist longer; and the lowest centres, being most organised, resist longest” (Hughlings Jackson, 1884a, p. 591). Dissolution of the lowest centers would result in death.

IV. Concomitance of the nervous system and the mind

Hughlings Jackson’s neurological framework separates body and mind. This separation was already implicit in the first component of the framework and it becomes explicit in the fourth component. This fourth component states that the mind and the nervous system exist in *parallel* and that there can be no causal interaction between them. This is Hughlings Jackson’s doctrine of *concomitance*. In his own words:

So far, I have, as much as possible, considered a man as a mere machine. I have often, it is true, in preceding remarks, used psychological terms; but I have really been dealing only with the nervous system – have been speaking of the physical conditions underlying mental states. Now, I speak of the relation of consciousness to nervous states. The doctrine I hold is: first, that states of consciousness (or, synonymously, states of mind) are utterly different from nervous states; second, that the two things occur together – that for every mental state there is a correlative nervous state; third, that, although the two things occur in parallelism, there is no interference of one with the other. This may be called the doctrine of Concomitance. (Hughlings Jackson 1884c, p. 705)

On a final note, Hughlings Jackson’s strict separation of the physical from the mental does not seem to be based on ontological grounds. As also argued by Chirimuuta (2017), it is better interpreted as a metaphysical position, serving as an artifact that allowed Hughlings Jackson to “bracket off” presently unanswerable questions and focus on matters that were within reach of the clinical and experimental methods available to him and his contemporaries.

References

- Chirimuuta, M. (2017). Hughlings Jackson and the “Doctrine of Concomitance”: Mind-Brain Theorising Between Metaphysics and the Clinic. *History and Philosophy of the Life Sciences*, 39, Article 26. <https://doi.org/10.1007/s40656-017-0153-2>
- Critchley, M., & Critchley, E. A. (1998). *John Hughlings Jackson: Father of English*

Neurology. Oxford University Press.

Hughlings Jackson, J. (1884a). The Croonian Lectures: Evolution and Dissolution of the Nervous System. Lecture 1. *The British Medical Journal*, March 29, 1884, 591-593.

Hughlings Jackson, J. (1884b). The Croonian Lectures: Evolution and Dissolution of the Nervous System. Lecture 2. *The British Medical Journal*, April 5, 1884, 660-663.

Hughlings Jackson, J. (1884c). The Croonian Lectures: Evolution and Dissolution of the Nervous System. Lecture 3. *The British Medical Journal*, April 12, 1884, 703-707.

York, G. K., & Steinberg, D. A. (2007). An Introduction to the Life and Work of John Hughlings Jackson: Introduction. *Medical History. Supplement*, 26, 3-34.

Appendix 6

Janet's dissociation model: action and consciousness

Pierre Janet—a biographical overview

Pierre Janet was born in Paris in 1859. He graduated in philosophy in 1882 and embarked on a professional career as a teacher. From 1883 to 1889 Janet served as a young teacher of philosophy at the Lyceum in Le Havre, a coastal city in the north-west of France. There he began looking for a suitable subject for his doctoral thesis in philosophy. By 1885 he had found his subject and embarked on the study of hypnosis, suggestion and hysteria. His research was empirical in nature and meticulous. Janet's first paper on the subject was about suggestion at a distance and it attracted international attention. Thanks to this paper Janet became acquainted with Charcot. In 1889, at the age of 30, Janet defended his doctoral thesis *L'Automatisme Psychologique*. By this time he had built up a considerable clinical reputation. Yet, to advance further in the field of psychiatry he knew he had to become a medical doctor. Thus, in the same year Janet moved back to Paris, where he started to study medicine. He was invited by Charcot to join him at Le Salpêtrière. Janet took up the invitation. He defended his medical thesis in 1893, with Charcot as chairman of the jury. Charcot unexpectedly died three weeks later. Janet remained at Le Salpêtrière, and for some years also continued to teach philosophy (until 1898). In 1898 he became lecturer and later assistant professor in experimental psychology at the Sorbonne, while also teaching at the Collège de France. Initially his appointment at the Collège was temporary, but in 1902 he was appointed permanent professor in experimental and comparative psychology. He kept this position until 1934 or 1935 (Ellenberger, 1970).

Throughout his professional life, up until his death, Janet wrote almost 50 books, book chapters and papers. Only a small number of these have been translated in other languages. Janet's published works, which include both philosophical and psychological publications, have been estimated to amount to more than 17,000 pages in print (van der Hart & Friedman, 1989).

During more than 50 years Pierre Janet worked on his theories of psychology, psychopathology and psychotherapy. His theories were elaborate and mostly unique (but as we will see, there is a clear structural similarity between Janet's hierarchy of psychological functions and Hughlings Jackson's hierarchy of nervous centers; furthermore, both models are based on evolutionary principles—see Appendix 5 for a synopsis of Hughlings Jackson's theoretical framework). Janet's theories were largely based on his long-term clinical work

with a number of—predominantly hysterical—patients. Around the turn of the century, Janet’s findings influenced the work of men such as William James, Breuer and Freud, Carl Gustav Jung and Alfred Adler. But after World War I interest in Janet’s work gradually waned. There were some noteworthy exceptions: Jean Piaget, who followed Janet’s lectures at the Collège de France from 1919 to 1921, considered Janet his most important teacher; and Lev Vygotsky was probably greatly influenced by Janet’s ideas about sociogenesis. For several decades Janet’s contributions were all but forgotten by most of the world. From the 1970s onward, his work received renewed interest—particularly his work concerning dissociation (Amann-Gainotti, 1992; Ellenberger, 1970; Meares, 1999; van der Hart, 1995; van der Hart & Friedman, 1989; van der Hart & Horst, 1989; van der Hart & van der Kolk, 1989; van der Kolk, Weisaeth, et al., 2007; van der Veer, 1988)

The main sources used for this Appendix are the chapter “Pierre Janet and Psychological Analysis” in Henri F. Ellenberger’s *The Discovery of the Unconscious: The History and Evolution of Dynamic Psychiatry* (Ellenberger, 1970, pp. 331-417) and the second edition of a series of published lectures by Janet given at Harvard University in 1906: *The Major Symptoms of Hysteria: Fifteen Lectures Given in the Medical School of Harvard University* (Janet, 1920).

L’Automatisme psychologique

Both in his philosophical dissertation and in his general approach Janet focused on human conduct as the key to understanding the phenomena he studied. As a young philosopher he realized that the study of “psychological automatisms” would be an excellent starting point to study human conduct. Psychological automatisms were the rudimentary forms of behavior Janet witnessed in his hysteric patients while they were in altered states of consciousness (e.g. in cataleptic-, somnambulistic-, or hypnotic states). Janet reasoned that analyzing these elementary forms of behavior could provide insights that would enable analysis of more complex forms of human conduct (Van der Veer, 1988; Ellenberger, 1970).

Earlier, in 1868, Prosper Despine had defined psychological automatisms as “very complex and intelligent acts reaching a goal which is perfectly specific and adjusted to circumstances; acts exactly similar to those which the ego commands in other occasions through the same apparatus” (Despine cited in Ellenberger, 1970, p. 359). Despine had considered such automatisms products of “a living machine, devoid of consciousness” (Ellenberger, 1970, p.359). Janet did not believe that automatisms were performed *mechanically*. He argued that, although they were clearly not regulated by the normal personality, they could easily be distinguished from the ‘behaviors’ of inanimate, mechanical

objects and must therefore still be regulated by *psychological* factors, not by mechanical ones.⁶³

Janet didn't think automatisms should be considered *unconscious*, he argued that although the form of consciousness related to such behavior was different from ordinary personal consciousness – it was not connected to ordinary (personal) perception, and lacked the personality's sense of self – it was nevertheless *conscious*. Because the *level* of consciousness at work in automatisms appeared to operate well below the level of ordinary personal consciousness Janet called it *subconscious* (Van der Hart & Friedman, 1989; Van der Hart & Horst, 1989).

Thus, Janet concluded that even the most rudimentary human actions must be regulated by psychological factors and cannot be entirely unconscious. The psychological theories Janet developed during his life revolved around the psychological factors that regulate human actions and behavior, and consciousness played an important part in them.

Important hypotheses of Janet connected to human behavior and action were (Van der Veer, 1988; Ellenberger, 1970):

1. There can be no sensation or feeling without movement;
2. Every form of human behavior has evolved from a *specific movement* (a motor act);
3. Individual mental behavior originates in social behavior;
4. Ideas have the natural tendency to develop into acts.

How ideas develop into acts: the operation of assent

In the introduction to the second edition of *The Major Symptoms of Hysteria: Fifteen Lectures Given in the Medical School of Harvard University* (Janet, 1920), Janet explains the genesis of the behavior displayed during hysterical episodes from the perspective of his hypothesis that ideas have the natural tendency to develop into acts. His explanation sheds light on the concepts of *consciousness* and *psychological factors* used by Janet (e.g. in *L'Automatisme psychologique*) and I will therefore use it as the starting point from which I attempt to illuminate Janet's psychological findings and theories.

In the first edition of *The Major Symptoms of Hysteria* (published in 1907), Janet had proposed that an automatism executed when a patient is in an altered state of consciousness can be understood as a manifestation or expression of a specific conviction in the mind of the

⁶³ Janet's reasoning clearly runs contrary to the first and the fourth component of Hughlings Jackson's conceptual framework that the nervous system is a sensorimotor machine and that there can be no causal interaction between the mind and the nervous system.

patient: a “*fixed idea*”. In the introduction to the second edition he notes that his proposal that an automatism can be seen as a manifestation of a fixed idea has led some of his contemporaries to theorize that (*auto*)-*suggestion* (which can be seen as a mechanism that delivers and/or reinforces a fixed idea) and *repression* (which can be seen as a mechanism that drives the idea out of consciousness – Janet calls it “driving back”) are the *cause* of hysteria and neurosis. Janet disagrees with such theories, he considers repression and a (heightened) susceptibility to (auto-)suggestion as *symptoms*, themselves requiring explanation.

According to Janet the essential phenomenon to be studied in order to understand the exact role that suggestion, repression and (fixed) ideas play in automatisms is the psychological phenomenon of “*impulsion*” – which is best understood as a term for an *involuntary* (in many cases pathological) act. Janet starts this inquiry with the question how “ideas of acts” turn into a *voluntary* (or *conscious*) actions⁶⁴. He argues that in the light provided by a proper analysis of the *voluntary* (or conscious) act, the nature of the contrasting *involuntary* (or subconscious) act should reveal itself.

Janet argues that in mentally healthy people the key to the establishment of a connection between the *idea of an act* and the *execution of the act* is the “operation of assent” (Janet, 1920, p. xviii). Ideas of acts/actions present themselves to the mind, but upon presentation their development into action⁶⁵ is *suspended* while they are being consciously *evaluated*⁶⁶ (see Figure A3 top). This evaluation not only involves the whole personality (with all psychological energy and abilities available to it), it also reflects the extent to which the personality is in touch with the demands of external reality.

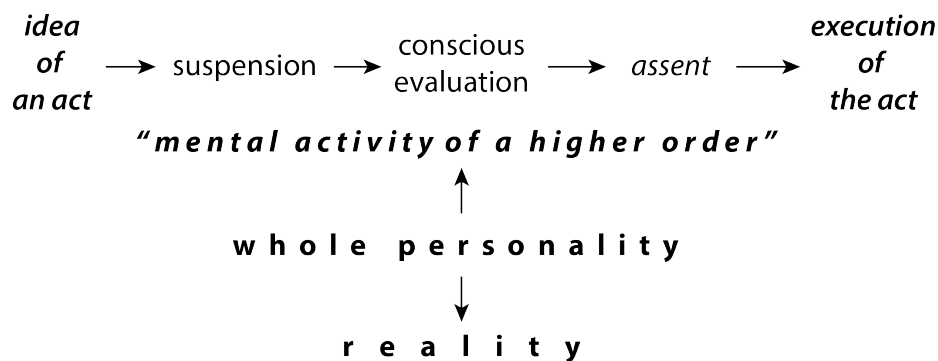
⁶⁴ Janet distinguishes between *immediate* action, where an (accepted) idea is immediately executed (he calls this “will”), and *deferred* action, where the action is deferred or conditional upon certain circumstances (such an action he calls “belief”). To explain the difference between “will” and “belief” Janet gives the example that the belief that it is raining can inspire us to take an umbrella along when we have to go outside; the umbrella is not *immediately* opened, it is only opened when we leave the room, thus it is a deferred action, conditional upon actually entering the rain (Ellenberger, 1970).

⁶⁵ Be it immediate or deferred (or conditional) action, see previous footnote.

⁶⁶ Janet himself does not use the word *evaluation*, he uses the words “reflection”, “deliberation”, “comparison”, “investigation” and “appreciation”.

Figure A3

The operation of assent



Note. A schematic diagram of the “operation of assent” according to Janet.

Janet called this last aspect (the ability of the personality to be in touch with the demands of reality) the *fonction du réel* – the “function of reality”. Janet: “The most difficult mental operation, since it is the one which disappears first and most frequently, is the *fonction du réel*.” (Janet, cited in Ellenberger, 1970, p. 376). The function of reality results in *présentification*: the mental synthesis (or representation) of the present moment.

Presentification is a synthetic operation that consists of *attention* (the ability to perceive the outside reality as well as one’s own internal reality), and the *ability to act appropriately* upon the external reality. “The real present for us is an act of a certain complexity, which we grasp as one single state of consciousness in spite of this complexity, (...) Presentification consists of making present a state of mind and a group of phenomena” (Janet, cited in Ellenberger, 1970, p. 376).

Just like presentification, the steps of suspension and conscious evaluation of an idea of an act require “mental activity of a high order” (Janet, 1920, p. xviii). In order to situate the concept of *mental activity of a higher order* in Janet’s overall psychological theories I will briefly summarize Janet’s classification of specific psychological abilities and the psychological factors on which these abilities depend. Janet developed this classification gradually, over several decades – in fact it partly evolved out of his concept of the *fonction du réel*, which he had already formulated in *L’Automatisme psychologique*.

Janet didn’t refer to psychological functions, but to “*tendances*” (*tendencies* or impulses). As Moskowitz et al. (2008) point out, Janet used the term *tendencies* to indicate that these functions should be considered (potential) mental or psychological *actions*. Oppenheimer (1991) quotes Schwartz explaining that a tendency is “a disposition of the

organism to execute a determined action” (p. 13). As mentioned above, Janet considered thinking, remembering etc. *actions* – mental activities that had developed from social behavior. This evolutionary development is reflected in Janet’s hierarchy of psychological tendencies. According to Janet’s view of evolutionary development, social interaction encouraged primary actions to develop into language; gradually language separated from bodily activity and became a symbolic activity; subsequently silent (internal) language developed into thought. Eventually Janet identified a hierarchy of nine psychological tendencies, which he classified into three groups: lower, middle and higher tendencies – see Table A2. I merely list the tendencies in Table A2, for a concise summary see Ellenberger (1970) pp. 387-394, and van der Hart et al. (2006).

Table A2

Janet’s hierarchy of psychological tendencies

Level	tendencies
Higher tendencies	9. Progressive tendencies: authenticity and originality, the ability to create 8. Experimental tendencies – learning from experience (experimentation) 7. Rational-ergetic tendencies – related to the ability to <i>work</i> (without immediate reward and enduring fatigue and boredom)
Middle tendencies	6. Reflective actions and beliefs (through the development of reflective thought) 5. Immediate actions and assertive beliefs (due to the separation of language from action, language becomes able to produce beliefs – either connected to reality or not)
Lower tendencies	4. Elementary, preverbal intelligence 3. Preverbal socio-personal actions 2. Responsive actions (responding to perceptions) 1. Reflexes and instincts

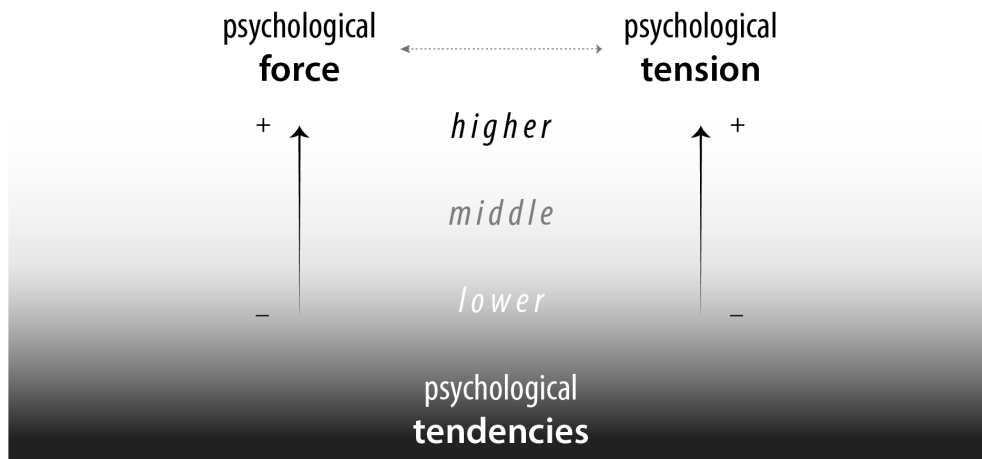
Note. The tendencies are listed in reverse order to emphasize the idea of hierarchy, and also to facilitate comparison with Hughlings Jackson’s hierarchical order of nervous centers.

The listing of the tendencies in this table is based on H. F. Ellenberger, 1970, *The Discovery of the Unconscious: The History and Evolution of Dynamic Psychiatry*, pp. 387-394.⁶⁷

Based on his clinical observations, Janet postulated that the ability to actively engage in these psychological tendencies (to turn them from tendencies to actions) depends on two further psychological factors. The first factor on which their engagement depends is the available psychological energy, for which Janet used the term *psychological force*. Moreover, the capacity to utilize the available psychological force to engage in *higher* psychological tendencies depends on a second factor, which Janet called *psychological tension*. In 1903 Janet defined psychological tension as the combination of the act of condensing and assimilating psychological phenomena (mental synthesis), and the aggregate of psychological phenomena thus synthesized (Ellenberger, 1970, p. 377). The degree of psychological tension of a person corresponds to the highest psychological tendency she/he is able to engage in. The relation between psychological tension, psychological force and psychological tendencies is thus as follows: the higher the individual psychological tension, the greater the capacity to utilize one's psychological force for engagement in higher psychological tendencies (see Figure A4).

Figure A4

Psychological tension, psychological force, and psychological tendencies



Note. Janet's model of psychological tension, psychological force and psychological tendencies. High psychological tension combined with high psychological force enable the engagement in higher psychological tendencies. Deficiencies in psychological tension and/or force lead to an inability to

⁶⁷ Van der Hart et al. (2006) propose the following, more synthetic list of Janet's psychological tendencies (which they call *action tendencies*): *Lower level action tendencies (ATs)*: 1) basic reflexes; 2) presymbolic regulatory ATs; 3) presymbolic sociopersonal ATs; 4) basic symbolic ATs; *Intermediate level ATs*: 5) reflexive symbolic ATs; 6) reflective ATs; *Higher level ATs*: 7) prolonged reflective ATs; 8) experimental ATs; 9) progressive ATs.

engage in higher psychological tendencies and imbalances in force and tension can result in pathologies.

Returning to the operation of assent described in the introduction to the second edition of *The Major Symptoms of Hysteria*, we may assume that Janet meant the higher psychological tendencies and the capacity to engage in them when he referred to “mental activity of a high order” (Figure A3). Such mental activity of a high order can however not always be afforded—the available psychological force and/or the psychological tension required to use the psychological force to engage in higher tendencies may be (momentarily) insufficient. Janet proposed that in circumstances where such mental activity cannot be afforded, assent is granted in a simpler, more immediate way. This second mode of assent does *not* involve suspension and conscious evaluation. In that case:

[t]he assent is immediate, and is simply induced by the present and momentary force that each idea brings with it, whatever may be the accidental circumstance which gives it this force. Then it is that one wills and believes simply what one desires, what pleases one momentarily, what is strongly presented to one's mind by an outer influence. (...) these phenomena are immediate and irreflective. They still bring about acts, and even acts that are sometimes more violent, and more tenacious, but they do not in the same manner involve the whole personality and do not bear with them, like reflective beliefs, the feeling of reality. It is such [acts] that are often accompanied with the feelings of automatism, depersonalization and irreality. (Janet, 1920, p. xix).

Thus, according to Janet, there are two modes of assent: *conscious* assent, resulting in *voluntary* acts, and *subconscious* assent, resulting in “*impulsions*” (to which psychological automatisms belong). To be clear, both voluntary acts and “impulsions” arise from an *idea of an act*, but in the first case execution of the act is suspended and consciously evaluated through the engagement of higher psychological tendencies, while in the second case no such evaluation takes place and the idea is approved *subconsciously*, driven by its own inherent force, or by the force it has received from other inner or outer sources. The inability to use higher psychological tendencies – either because they have been insufficiently developed, or because the force to sustain them or the capacity to utilize the available psychological force is (temporarily) lacking – inevitably leads to the inability to suspend and consciously evaluate an idea of an act.

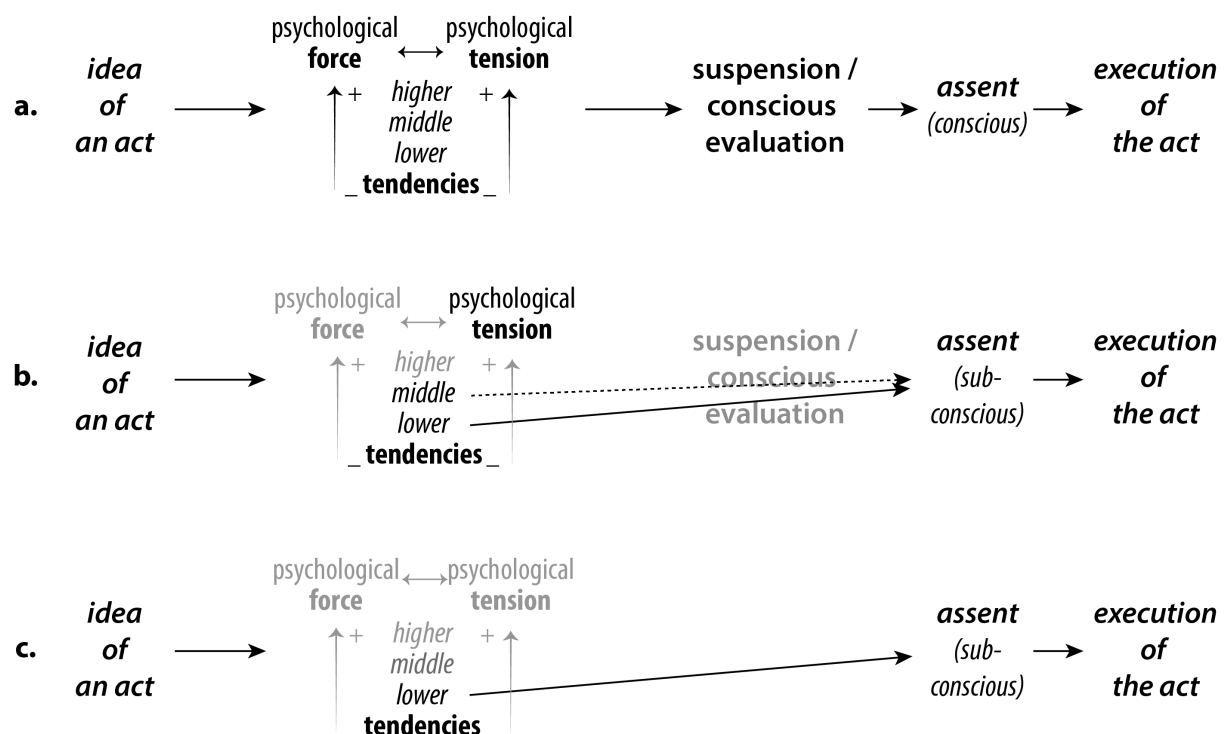
Janet’s concept of the *function of reality* is intimately related to the ability or inability to afford conscious assent to an idea of an act. The ability to act appropriately upon external situations, to adjust to demanding social or professional situations, or even to act creatively in

such situations, requires the engagement of higher psychological tendencies: it demands a high or very high level of synthesis of *attention* to external and internal circumstances and the *ability to act* according to these circumstances. On the other hand, the lower psychological tendencies (automatic actions, habits etc.) require much less attention to and ability to act upon present circumstances (Ellenberger, 1970).

According to Janet, increased susceptibility to (auto-)suggestion, obsession and exaggerated forms of repression can all be understood as behaviors resulting from different combinations of insufficient psychological force, underdeveloped psychological tendencies, or insufficient psychological tension. As a summary, three different combinations of the processes involved in the approval of an idea of an act are schematically represented in Figure A5. The first combination represents the operation of assent during a voluntary act, the other two combinations are examples of what Janet called “impulsions”.

Figure A5

The influence of psychological force, tension, and tendencies on ideas of action



Note. Janet’s synthetic model of the influence of different levels of available psychological tendencies and available psychological force and tension on the suspension, evaluation and approval of ideas for action. a. is a schematic representation of the process responsible for voluntary acts. b. and c. are representations of processes leading to involuntary acts or “impulsions” (automatisms).

In the introduction to the second edition of *The Major Symptoms of Hysteria* Janet proposed a (rough) classification of three psychological states related to the two modes of assent to an idea of an act. In the first state the individual has sufficient psychological force

and psychological tension to suspend and evaluate the idea of an act consciously before allowing it to be executed (the process represented in Figure A3 and in Figure A5a). In the second state the individual lacks sufficient psychological force and/or abilities to suspend and evaluate the idea consciously and its execution is driven by other (external and/or subconscious) factors (Figure A5c – only subconscious factors are indicated). Between these two extremes lies an intermediate state in which an individual *in principle* has the capacity to suspend and evaluate an idea of action, but “according to circumstances” (Janet, 1920, p. xix) she/he lacks the psychological force to *sustain* the process of conscious evaluation. Initially the idea of an act is suspended and the individual reflects on it to a certain degree, but the psychological energy to sustain the process of suspension and evaluation is insufficient and the assent to execution of the action is given before conscious evaluation has been completed (Figure A5b).

According to Janet, impulses, or psychological automatisms can “arise when different phenomena bring about the rapid exhaustion of reflection and the appearance of immediate and elementary assents” (Janet, 1920, p. xx). In other words certain phenomena or circumstances can lead to a sudden drop in available psychological energy and/or to the sudden incapacity to engage in higher psychological tendencies (resulting in the inability to synthesize present reality and to attend to it). An important example of such circumstances are traumatic experiences. Janet gives the following general examples (related to hysterical paralysis):

Indeed, traumatic accidents are among the most frequent causes. Railway catastrophes give rise to many of these accidents, and some physicians had even adopted the expression of railway spine. Falls from carriages, from horseback, and shocks received in battles are their most common origin. (Janet, 1920, p.140).

And now the first part of Janet’s implicit “trauma-model” becomes evident. As we have seen, Janet’s overall goal was to understand human behavior in general and his starting point was understanding the symptoms, the specific behaviors displayed by his patients – most of whom, at the time, were diagnosed with hysteria. As we will see by the end of the next subsection, Janet developed quite an elaborate psychological system, based on the concepts of psychological force and tension. This system was by no means limited to understanding hysteria, it endeavored to explain a much broader range of pathologies. When considering Janet’s theories and models we can’t really speak of a *trauma-model*, because for Janet trauma was not a separate pathology. He rather identified traumatic experiences as one of the most common causes of the pathologies he studied and Janet’s explanations of the

symptoms and behavior of his hysteric patients were never meant to be a trauma model. Nevertheless we start to distinguish a theoretical model in which traumatic experiences such as those we came across in the previous chapter (e.g. railroad accidents and battle shock) play an important part.

As described above, Janet understood the “psychological automatisms” of his hysteric patients to be subconsciously approved acts resulting from *ideas* – specifically from fixed ideas, repressed ideas, or ideas introduced through suggestion. During a hysterical episode these patients couldn’t afford the healthy (conscious) operation of assent of ideas of acts and as a consequence the inherent force of the idea (or the force lent to the idea through suggestion) led to execution of the act.

According to Janet’s model there can be three reasons why such patients cannot afford suspension, conscious evaluation and conscious assent of the idea: a) the patient’s ability to engage in higher psychological tendencies is insufficiently developed; b) the patient (temporarily) lacks the psychological tension to engage in higher psychological tendencies; or c) the patient (temporarily) lacks the psychological force or energy to engage in higher psychological tendencies. The first reason—a—is a matter of general psychological development; b) and c) however, *can* be—and according to Janet commonly *are*—the result of traumatic accidents or battle shock.

Although Janet realized that hereditary factors often contributed to hysteria by providing a “*morbid ground*” on which psychological shock could unleash the symptoms of hysteria and although Janet didn’t doubt that psychological forces are of a physiological nature (Ellenberger, 1970), Janet’s dynamic model is the first purely psychological model. When comparing Janet’s model to the composite trauma model of Page, Charcot and Putnam summarized in Study 3, it becomes clear that (although both models have much in common) with his description of psychological tendencies, psychological force and psychological tension and their mutual interactions, Janet lifted the neurological part of Page, Charcot and Putnam’s model (based on Hughlings Jackson’s framework—see Appendix 5) to a *psychological* level.

However, what I have described and analyzed thus far is only part of Janet’s “trauma” model. The revival of interest in Janet’s trauma-related work since the 1970s is strongly related to another part of Janet’s studies: his study of the phenomenon of *dissociation*.

Consciousness and dissociation

When considering psychological automatisms Janet distinguished between *total* automatisms—those that involve the subject as a whole (as in cataleptic states,

somnambulism and hypnosis)—and *partial* automatisms—in which part of the personality of the subject can be accessed while the main personality is not aware of it (e.g. through automatic writing while the main personality is distracted). Janet proposed that behind both total and partial automatism lies the phenomenon of *dissociation*, in which part of the personality is split off from the main personality. This part continues to exist, but the main personality is no longer consciously aware of it. In total automatisms the main personality goes unconscious while the dissociated aspect manifests itself. In partial automatisms the main personality remains conscious, but is not aware that the dissociated part manifests itself.

Janet developed a dissociation model, which is based on his clinical observations (predominantly of hysterical patients), as well as on his historical, philosophical and clinical study of hypnotism.

Central to Janet’s dissociation model is his notion of consciousness. As indicated in the previous section, Janet believed that no human activity is devoid of consciousness, that no human activity can be *unconscious*. But as shown, this does not mean that all human behavior is fully conscious. Under certain circumstances conscious assent cannot be afforded and other, not conscious factors drive a person’s behavior. In order to account for this, Janet introduced the concept of *subconscious* processes: processes of which the main (conscious) personality is not conscious.

Table A3

Five different modalities to which the term “consciousness” can refer

Modality	Examples
I. state (<i>level</i> of conscious experience)	waking consciousness dreaming consciousness sleeping consciousness being conscious (as opposed to not being conscious); regaining consciousness
II. capacity / facility (“strength”)	expanding consciousness (to sub/unconscious content/processes) ⁶⁸ facility to remain conscious
III. function (<i>act</i> of consciousness)	consciousness as the <i>act</i> of being aware being conscious - being attentive (mindful) being conscious <i>of</i>

⁶⁸ See De Wit (2016).

	the light of consciousness focused consciousness (attention) thinking (as used in some older texts)
IV. level / part / area within/of the psyche ^{a,b}	the subconscious (Janet) the preconscious (Freud) the unconscious (Freud) <i>the Id</i> (Freud/Groddeck) ^c personal consciousness (Janet) ^d the ensemble of consciousness (Janet) ^d second consciousness (Janet) ^{a,c}
V. field (of awareness)	field of consciousness (Janet) narrowed/contracted field of consciousness (Janet)

Notes:

^a Referring to a quote from Fechner, Freud used the term “topographical” for this modality (Ellenberger, 1970, p. 511).

^b Often the use of the term consciousness in this modality includes the contents of consciousness, which makes the term even more confusing.

^c Freud’s term for the unorganized part of the (personal) unconscious, *das Es* (translated by James Strachey as the *Id* – a Latinization), was borrowed from Georg Groddeck (Groddeck, 1923).

^d Janet’s notions of “ensemble of the mind”, “ensemble of consciousness”, “personal consciousness” and “second consciousness” are dynamic modalities that lie between “wholeness” (due to synthesis) and parts (due to lack of synthesis and in extreme cases due to dissociation).

Now, before continuing to describe the role conscious and subconscious processes play in Janet’s dissociation model, I want to make a more general observation regarding the use of the term *consciousness*. Consciousness is a diffuse concept; the term “consciousness” can be used to refer to a mental *state*, a *capacity*, a mental *function*, a mental *level*, or to a *field* of awareness.⁶⁹ See Table A3 for examples of the different modalities to which the term consciousness can refer. This unclarity regarding the term consciousness also features prominently in Janet’s work. Although he normally classified the terms he used very precisely, Janet’s use of the term consciousness appears quite liberal and it covers most of the above-mentioned modalities (see Table A3 for some examples). As we will see in this

⁶⁹ The adjective “conscious” is similarly diffuse—for instance: “conscious being” is used to indicate a being that has consciousness/is conscious; “a conscious thought” on the other hand usually does not indicate that the thought *itself* has consciousness (although it may also indicate this!), it usually means that the mind to which the thought appears (or that *thinks* the thought) is conscious *of* it – at least temporarily (or *potentially*); in the same general sense, but using different perspectives, it may indicate that a thought has “risen” from *subconscious* layers of the mind into its *conscious* layer, or that consciousness has expanded to its previously subconscious domain.

section, this unclarity makes it difficult to construct a proper image or model of what exactly is supposed to happen during dissociation.

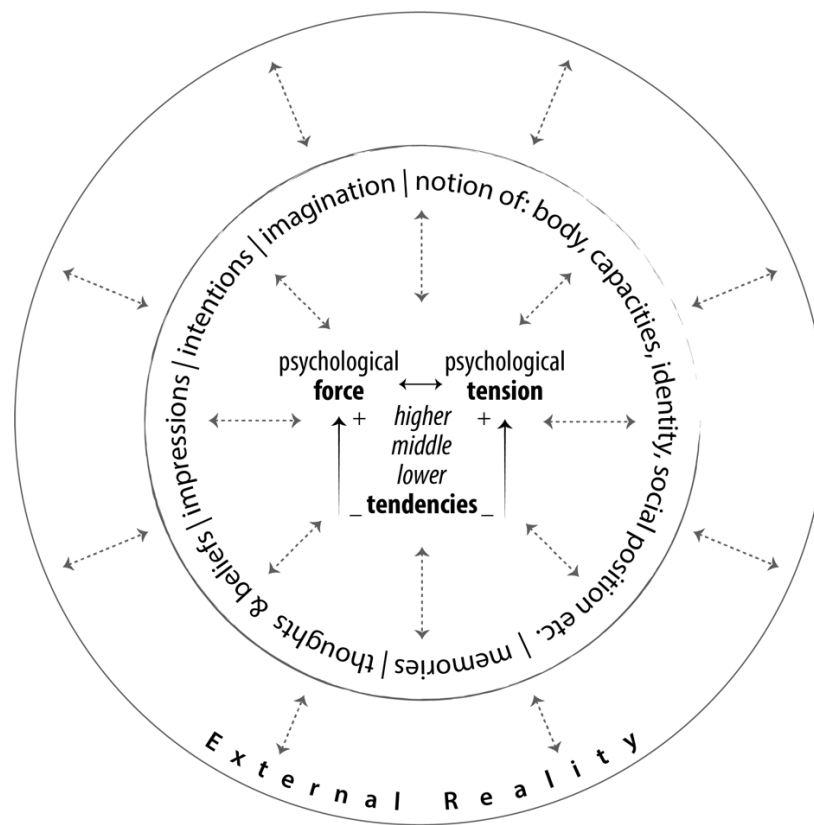
One of the central concepts in Janet's model of the psychological identity of the human being is what he alternately refers to as the *ensemble of consciousness*, *the ensemble of the mind* or *personal consciousness* (e.g. Janet, 1920, p. 173 & 185). It is the concept of the "whole person". In the following excerpt, taken from *The Major Symptoms of Hysteria*, Janet makes an attempt at a more comprehensive description:

(...) the word "I," (...) designates something very complicated. The question here is of the idea of personality, of my whole person; it is the union of present sensations (...), [of] all past impressions, [of] the imagination of future phenomena. It is the notion of my body, of my capacities, of my name, of my social position, of the part I play in the world; it is an ensemble of moral, political, religious thoughts. It is a world of ideas, the most considerable, perhaps, that we can ever know, for we are far from having made the tour of the domain of personality. (...) an enormous mass of thoughts (...) constituted into a system – "I". (Janet, 1920, p. 305)

Janet's notion of the "whole person" is not to be understood as an a-priori entity (as in the traditional meaning of the term "soul" for instance), it is to be understood as a dynamic synthesis: the synthesis of dynamic contents (memories, thoughts, impressions, social beliefs etc.), organized into a dynamic "whole" by regulating components. These regulating components also interact in a dynamic fashion; they consist of the previously mentioned *psychological tendencies* (divided into three hierarchical levels: lower, middle and higher tendencies), *psychological force* (Janet's term for available psychological energy) and *psychological tension* (the capacity to utilize the psychological force to engage in higher psychological tendencies). Reiterating Figure A4 and part of Figure A5, the regulating components involved in Janet's model of dynamic synthesis are once more represented in Figure A6, this time not with reference to action, but in relation to the dynamic contents of the "system of the I" (the elements listed in the quote from Janet on the previous page) and to external reality. Thus Janet associated "personal consciousness" with regulatory processes meant to maintain the level of dynamic synthesis of the psychological system as a whole and in relation to external reality.

Figure A6

Janet's model of dynamic synthesis



Note. A schematic representation of Janet's model of dynamic synthesis: the dynamic contents of the "ensemble of consciousness", its regulating components, and its relation to external reality. Copyright 2019 by P. A. J. M. de Wit.

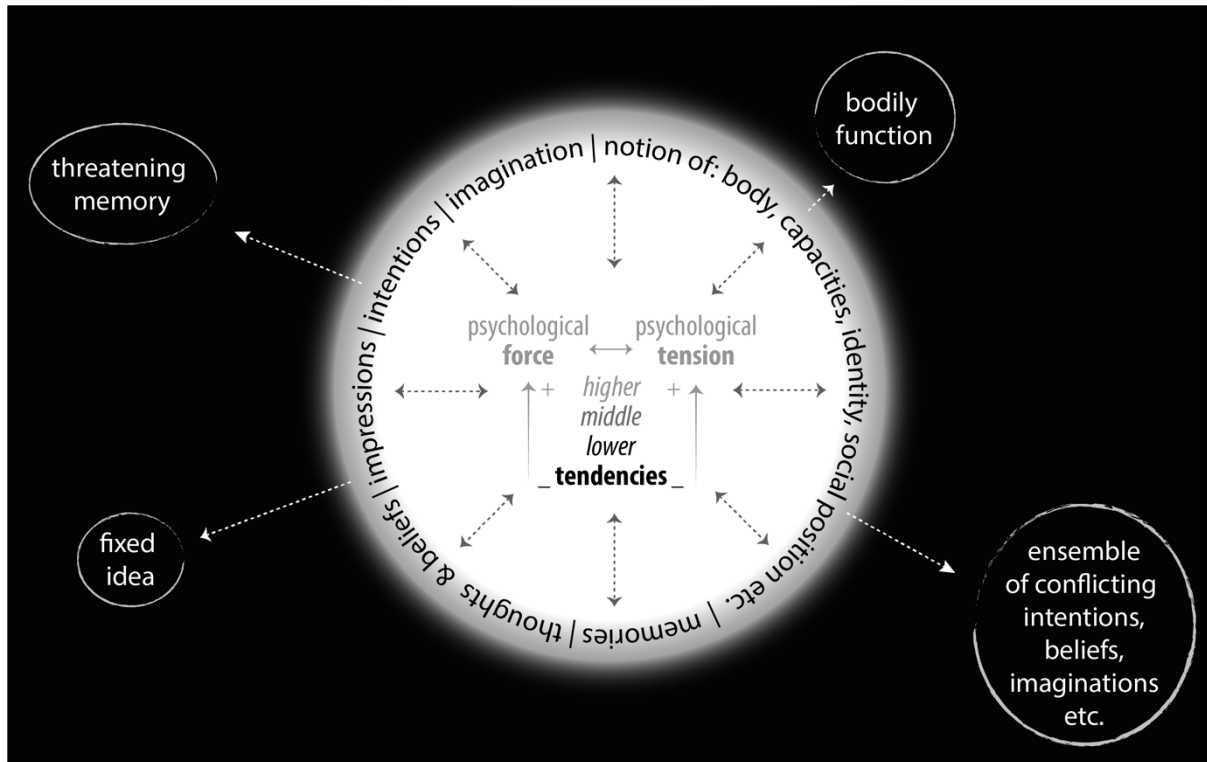
As we have seen in the previous section, under certain circumstances—developmental issues, organic issues, traumatic experiences, or a combination of those—the regulatory processes are incapable of maintaining a proper balance. As a result the dynamic synthesis comes under threat. One of the ways in which the dynamic synthesis can be maintained for personal consciousness is by *separating*, or *dissociating* the factor that is the focal point of the threat, from the rest of the system. As a result the dynamic synthesis of the main part of the personality is maintained, but the part that has been dissociated from it is now "lost" to personal consciousness. The remaining system no longer has control over the separated part. Janet:

[O]ne of the chief characters of hysterical anesthetics, distractions, amnesias, paralyses [i]s not the disappearance of a psychological phenomenon, but a particular transformation of this phenomenon in consciousness. It cease[s] to be a part of personal consciousness and no longer exist[s] but in another grouping of

psychological phenomena which constitute[s] the sub-consciousness or sometimes the second consciousness⁷⁰ of the somnambulisms or of the medianimic writings. (Janet, 1920, xiv-xv).

Figure A7

The main personality and dissociated sub-systems



Note. The main personality (a dynamic system in a weakened state of synthesis) and aspects of the personality that have been dissociated from the main personality and have formed subconscious sub-systems. Consciousness (white) is restricted to the main personality, the dissociated sub-systems lie outside personal consciousness in the subconscious (black). Copyright 2019 by P. A. J. M. de Wit.

In this manner different parts of the dynamic content of personal consciousness can become dissociated from it: threatening memories can become dissociated, leading to gaps in episodic memory or *amnesias*; strongly charged, or unacceptable ideas can become dissociated (repressed?), eventually leading to *fixed ideas*; bodily functions can become dissociated, leading to *hysterical paralyses*, or *spasms*; even conflicting aspects of the identity can become dissociated, leading to sub-identities (Janet, relates several cases of prolonged fugues, where dissociated sub-identities take over from the main identity and take control of body and consciousness to pursue their own goals. When the sub-identity experiences an existential crisis of its own, the main identity often returns (Janet, 1920, pp.

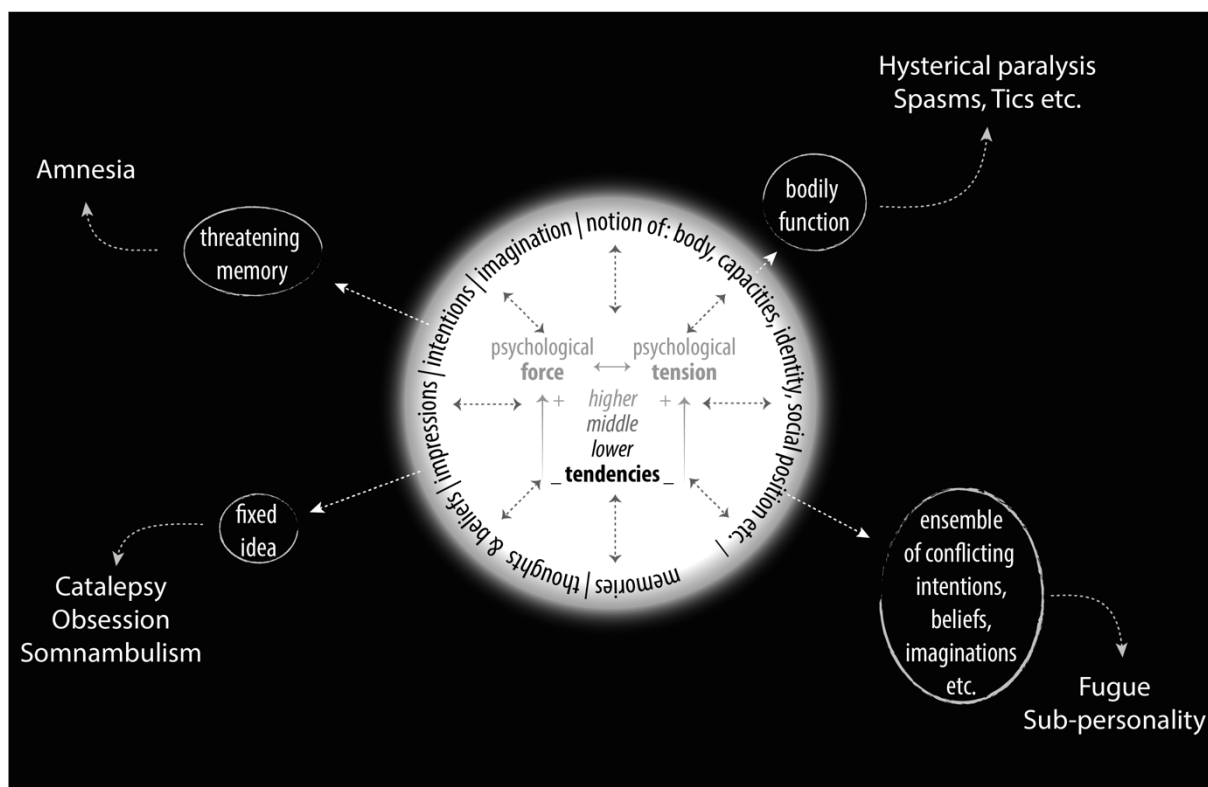
⁷⁰ A “grouping of psychological phenomena which constitutes sub-consciousness or sometimes the second consciousness”: this is an example of the use of the term consciousness to refer to a (sub) entity, including its content – see note *a* that accompanies Table 3.

45-54). These dissociated aspects form separate sub-systems, existing *outside* the consciousness of the main personality—see Figure A7.

It follows that dissociated aspects of personal consciousness can range from *single ideas* as manifested in catalepsy and monoideic somnambulism (Janet, 1920, pp. 31-37), to more complex systems of multiple ideas and feeling states as manifested in polyideic somnambulism (Janet, 1920, pp. 64-65), to complete sub-personalities as manifested in fugues and *dissociative identity disorder* (DID)⁷¹.

Figure A8

Dissociated sub-systems and the behavioral symptoms they give rise to.



Note. Dissociated aspects of the main personality give rise to subconsciously motivated behavior (both mental and physical behavior). Copyright 2019 by P. A. J. M. de Wit.

To complete the picture, Figure A8 adds the associated behavior to each dissociated aspect. As explained in the previous section, these behaviors result from ideas of acts that are executed without conscious assent. As these ideas are connected to psychological aspects dissociated from the main (conscious) personality, there is no conscious assent to their execution, and their execution is a result of subconscious processes. Nevertheless, their

⁷¹ DID is a contemporary diagnostic term (American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5 ed.). American Psychiatric Association. <https://doi.org/10.1176/appi.books.9780890425596>), but patients manifesting multiple (sub)personalities were known to Janet.

execution can be suppressed as long as the main personality has sufficient psychological force and tension at its disposal to do so.

An additional comment related to the structure of fixed ideas: while treating fixed ideas in some of his patients, Janet discovered that the dissolution of one fixed idea could bring other, *older* fixed ideas to the surface. This led Janet to the concept of chronologically stratified layers of fixed ideas (Ellenberger, 1970). During treatment these fixed ideas needed to be peeled away one after another, layer after layer. The manifestation of deeper rooted, older fixed ideas was sometimes associated with crises of increasing severity. Janet concluded that “subconscious fixed ideas are both the *result* of weakness and a *source* of further and worse mental weakness” (Ellenberger, 1970, p. 366, emphasis added). Thus, the image presents itself that, for example at a young age, in order for the personality to maintain dynamic synthesis, a threatening idea is dissociated from personal consciousness; however, the dissociation of the threatening idea is only a temporary solution, it leads to a weakening of the overall ability of the main personality to maintain its dynamic synthesis. Now, when new threatening ideas present themselves they will need to be dissociated too. These dissociated ideas can gradually form a layered structure that becomes more and more powerful because of the psychological force that remains associated with the dissociated ideas and because the main personality has lost more and more of its function of reality.

I should note that as I have presented it thus far, Janet’s use of the term dissociation differs subtly from most contemporary uses. As presented so far Janet appears to have used the concept of dissociation primarily to indicate separated aspects of the *content* of what he called personal consciousness, and he did so from the “wider perspective” of the clinician. From the clinician’s perspective these aspects appear to become part of the *subconscious* (whereas from the point of view of the patient they *disappear*—the patient is no longer *conscious* of them). Most contemporary uses of the term dissociation are closer (but not identical) to the perspective of the subjective (conscious) experience of the person experiencing symptoms of dissociation. Two examples: “Dissociation leads to inner distancing and is thus to be regarded as a fundamental withdrawal mode enabling the person in question to phase out the unbearable reality for the moment and pretend that it has never happened.” (Breh & Seidler, 2007, p. 54);

Dissociative disorders are characterized by a disruption of and/or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception, body representation, motor control, and behavior. (...)

Dissociative symptoms are experienced as a) unbidden intrusions into awareness and behavior, with accompanying losses of continuity in subjective experience (i.e., “positive” dissociative symptoms such as fragmentation of identity, depersonalization, and derealization) and/or b) inability to access information or to control mental functions that normally are readily amenable to access or control (i.e., “negative” dissociative symptoms such as amnesia). (American Psychiatric Association, 2013, p. 291).

In fact, when we analyze these two statements carefully, they appear to try to offer a more impersonal definition of dissociation by keeping the perspective (deliberately?) vague (or by mixing *various* perspectives – more detached ones with more subjective ones). In that sense Janet’s use of the term dissociation is more straightforward and clearer.

There is however still a problem with the way in which I have presented Janet’s explanation of dissociation thus far: it may give the impression that certain ideas etc. that are experienced as threatening are *expelled from* or *pushed out* of personal consciousness and end up in a sub-level of the personality, of which the main personality is not aware (the subconscious). And at times Janet *does* use exactly this imagery, for example when he writes in *L’Automatisme psychologique*: “(...) disturbances resulting from the *banishment of a thought from personal consciousness*” (quoted in Ellenberger, 1970, p. 361, emphasis added). Actually there are *two* problems with this image. Considering dissociation as a process of splitting off, or banishing, implies a purposeful, intentional *activity* (the phrase “a fundamental withdrawal mode enabling the person in question to phase out the unbearable reality for the moment and pretend that it has never happened” in the first quote above implies a similar intentional activity). But if dissociation is an intentional activity, *who* performs it? Where does the intention originate? This is the first problem and in the previous chapter we have seen that one answer to this question (even if it remains implicit)—that is that the intention lies with the main personality—ultimately leads to notions such as *simulation, faking* and *malingering*.

The second problem is related to looking at consciousness, or “the subconscious” (or the “main personality”, or “personal consciousness”) as if they are sub-entities or sub-levels (different “spaces” or “compartments”) of the psyche (modality IV in Table A3, Freud’s *topographical* concept of the mind). Why is this a problem? As described in the previous section, Janet considered involuntary, subconsciously driven acts to be manifestations of lower psychological abilities and a (greatly) diminished function of reality. Voluntary acts on the other hand were considered manifestations of consciously accepted ideas and reflected a

high function of reality. Thus consciousness and being attuned to reality are associated with higher abilities, while the subconscious is associated with lower abilities and a diminished function of reality. Dissociated ideas, memories and abilities are envisioned as banished from personal consciousness to the subconscious, where they are no longer under control of the main personality. They are associated with lower forms of behavior: involuntary impulses. However, as Janet (and several hypnotists, or mesmerizers before him) discovered, hypnosis of hysteric patients can lead to the curious discovery of so-called sub-personalities that have a greater or wider awareness and memory of the overall (life) circumstances of the patient than the “main” personality. The so-called main personality is not aware of such sub-personalities and suffers from amnesia for certain events, while certain sub-personalities (accessed under hypnosis) know everything about the main personality (as well as about other, more limited sub-personalities) and can fill in the gaps in the memories of the main personality and other sub-personalities. The image of the subconscious as a ‘colony’ of exiled ideas, memories and abilities giving rise to automatisms and other, lower forms of behavior, stands in stark contrast to the discovery that the subconscious can also house so-called “sub-personalities” with greater awareness than the conscious personality, and without amnesia. It makes little sense to conceive of a part of the psyche that has greater awareness than the “main” personality and doesn’t suffer from amnesia, as a dissociated *sub*-personality, or an “ensemble of conflicted thoughts, feelings, intentions, etc.” that have been dissociated and that are driven by lower, subconscious forces. Furthermore, the dissociated ideas, memories etc. *are* still accessible and can be accessed during hypnosis, or through automatic writing, while the “main personality” is distracted. Such subpersonalities with greater awareness and intact memory and the possibility to access dissociated ideas, memories etc. through hypnosis suggest the existence of a deeper, subconscious level of synthesis. However the existence of a deeper, subconscious level of synthesis doesn’t fit in Janet’s overall theoretical model, in which synthesis is the result of the (conscious) engagement of higher psychological tendencies.

Older mesmerists such as Puységur are reported to have accessed a *wise, or knowing part* in some of their hypnotized subjects that was able to diagnose the subject’s (or other subjects’) illnesses and prescribe adequate remedies or therapeutic interventions (e.g. Vijselaar & van der Hart, 1992; Ellenberger, 1970). Janet is likely to have read about this phenomenon (he studied the works of the older mesmerists thoroughly), yet I haven’t been able to find a reference to it in his work. In the 1970s, while investigating the perception of pain under hypnosis, Ernest Hilgard came across a possibly related phenomenon, which he

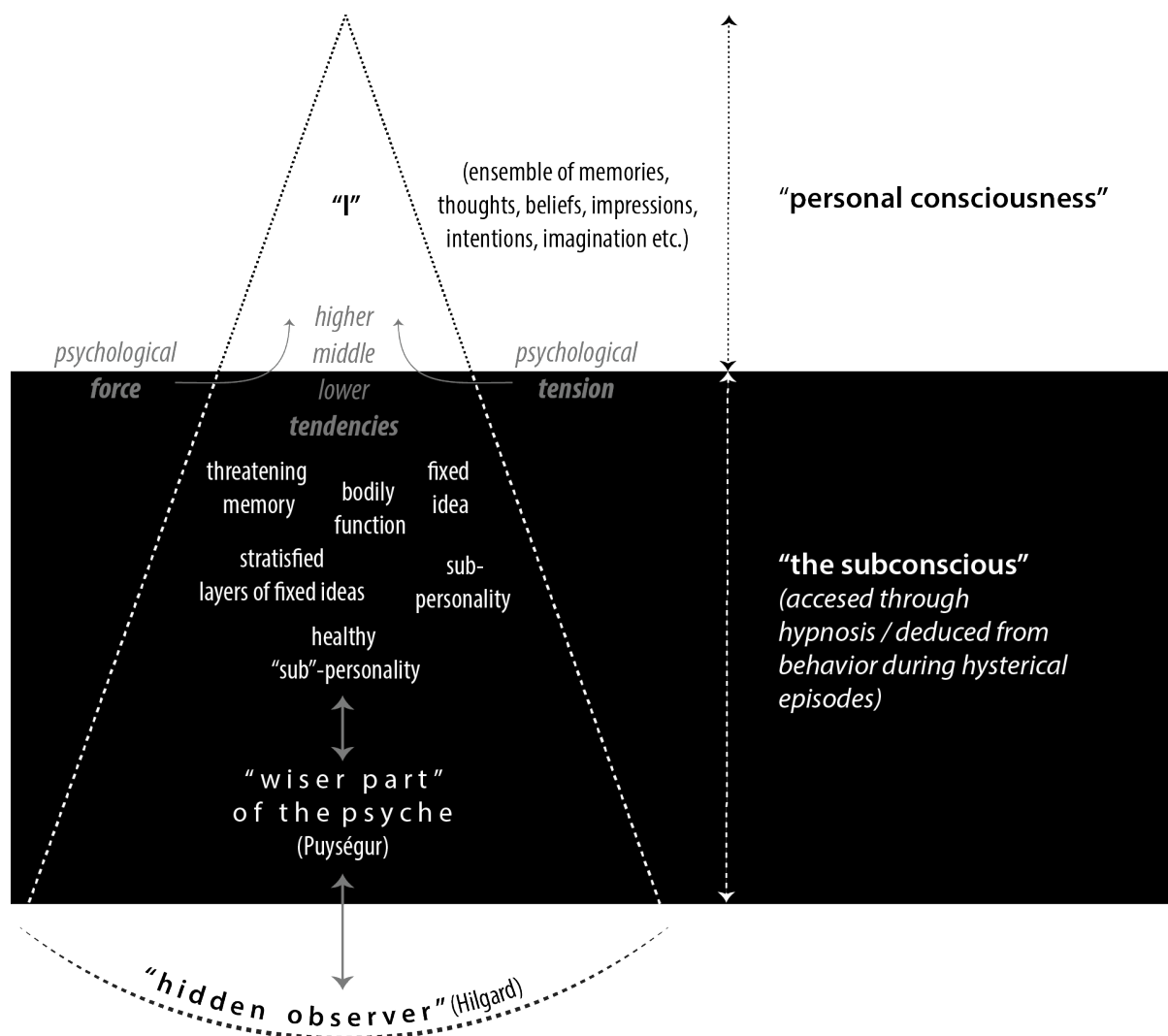
called the *hidden observer*, a (“hidden”) part of the psyche which is aware of everything, even when the normal personality is not (Hilgard, 1977). Although Janet didn’t refer to the knowing part of the psyche accessed by Puységur and some of his followers, he did concede that sometimes the part of the psyche accessed under hypnosis is the more healthy part (compared to the “main” personality) and that it represents the “total and complete individual consciousness”⁷² (Van der Hart & Horst, 1989, p.3).

The combination of subconscious elements described by Janet makes it difficult to build an accurate model of the psyche based on his findings and the notion that personal consciousness and the subconscious are sub-levels of the psyche. For example if we use the *iceberg-model* to represent Janet’s findings and theories – where the tip of the iceberg represents the conscious part of the psyche (personal consciousness), and the submerged part of the iceberg represents the subconscious part of the psyche—we get a model as presented in Figure 16. In such a model *the subconscious* initially appears to be the ‘colony’ of banished ideas, functions and memories mentioned above, which may induce pathological behavior (represented in the upper part of the subconscious in Figure A9). However upon deeper probing this “subconscious” also appears to accommodate beneficial “parts”—parts that are wiser, healthier, more complete, and more aware than the conscious personality (represented in the lower part of the subconscious in Figure A9). The difficulty—or impossibility—of creating a plausible model of the subconscious when it is thought to consist of—or contain—such a contradictory collection of pathological and beneficial elements, casts doubt on the credibility of the concept that the subconscious is a *level* (or sub-entity, or compartment) of the psyche. The difficulty of fitting the elements of dynamic synthesis (psychological *force*, -*tension* and -*tendencies*) into the model, where the lower tendencies are associated with subconscious behavior and the higher tendencies with personal consciousness, adds further doubts to the plausibility of this model.

⁷² I’m not sure if this phrase is a direct quote from Janet, but the idea that a subconscious “sub-personality” represents the “total and complete individual *consciousness*” sounds extremely contradictory. How can a *subconscious* “personality” represent *consciousness*? Phrases such as this one exemplify the confusion that can be encountered in the usage of the term consciousness (and associated terms).

Figure A9

The iceberg model of the psyche including Janet's and related concepts



Note. A schematic representation of the iceberg model of the psyche, with added to it Janet's hypotheses and related findings (the "wiser part" accessed by the old mesmerists and Hilgard's hidden observer—the circle representing the hidden observer can be imagined to extend into a full circle). Copyright 2019 by P. A. J. M. de Wit.

Janet may have had similar reservations. He also suggested a different way of conceptualizing consciousness by looking at it as a *field of awareness*, comparable to the field of vision. Janet proposed that in hysterical patients the field of consciousness became somehow *contracted* or *narrowed*. This contraction was not due to organic problems but psychological in nature, "conditioned by the patient's lack of psychological strength" (Ellenberger, 1970, p. 375). In the following quotations Janet respectively refers to "suppression", and the lack of psychological ("moral") power to "gather", "condense" and "assimilate" or "synthesize" certain psychological phenomena in the personality to explain this contraction of consciousness:

First of all, you do not find it in the normal individual. Normal consciousness, as philosophers say, is always a fully illuminated point, surrounded by a strong penumbra. With the hysterical, the penumbra is wanting [see Figure A10]. This fact is brought into evidence by their quite peculiar visual field ; you do not find in any normal individual that odd vision, which sees very clearly in one point and sees nothing around this point. Nor is this absent-mindedness to be met with in the same fashion in the other maladies of the mind. Individuals who are tired are inattentive, but their minds are vaguely on the stretch. No doubt, they search into nothing, but they have a vague notion of everything. Their sensibility is attenuated, I grant, but it is distributed over the whole of their body. Their vision is diminished, but their visual field remains broad. In a word, the symptom I wish to describe to you is not inattention ; it is a suppression of all that is not looked at directly, and I do not believe that it is to be found in this form in the other diseases of the mind. So I make it a stigma⁷³ proper to hysteria as suggestion itself.

(...)

I am therefore inclined to think that this notion of the retraction of the field of consciousness summarizes the preceding stigmata, and we may say that their fundamental mental state is characterized by a special moral weakness, consisting in the lack of power, on the part of the feeble subject, to gather, to condense his psychological phenomena, and assimilate them to his personality.

(...)

It is a malady of the personal synthesis, and I will take up again, very slightly modified, the formula I have already presented. Hysteria is a form of mental depression characterized by the retraction of the field of personal consciousness and a tendency to the dissociation and emancipation of the systems of ideas and functions that constitute personality. (Janet, 1920, pp. 298-332)

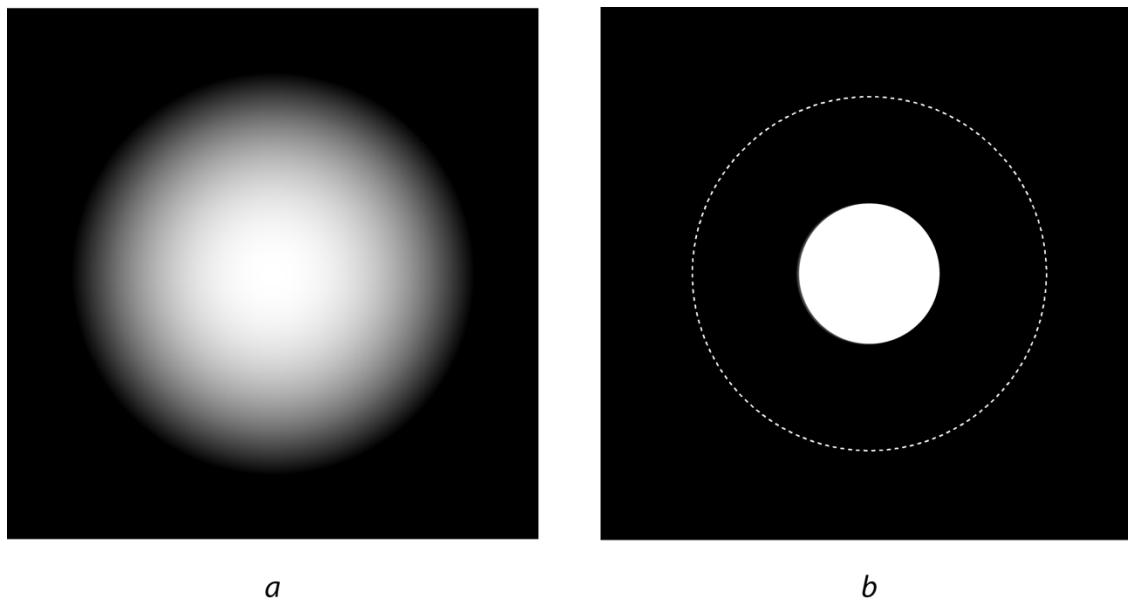
The model of a contracted field of consciousness says nothing about the organization of the psychological phenomena that lie outside the field of consciousness, or about the structure, or organization of the psyche itself (although perhaps Janet's mention of a *penumbra*—or the lack thereof—in the quote above hints in those directions—see Figure A10); neither does it suggest that phenomena that can't be “condensed” and “assimilated” and are left outside the field are *actively* “banished” from consciousness; on the contrary, it

⁷³ Janet distinguished two levels of symptoms in hysterical patients: *accidents*: “accidental or contingent symptoms” and *stigmata*: “permanent, basic symptoms” (Ellenberger, 1970, p. 375).

suggests that consciousness, as a function of being aware of psychological phenomena, is *retracted* from phenomena that are difficult to assimilate and contracted into a field that is limited to assimilated ideas, memories and abilities. However, the questions of a) *what* could cause this contraction (other than it being conditioned by the negative factor of a lack of “psychological strength” or “moral power”) and b) whether it is a *deliberate* (intentional) act or some type of *reflexive* reaction, do not appear to have been taken up by Janet.

Figure A10

The field of consciousness and its penumbra



Note. Janet’s analogy of the healthy field of consciousness as a fully illuminated point surrounded by a strong penumbra (a): the strong penumbra represents a gradual transition from fully conscious to not conscious. In hysterical patients the field of consciousness is narrowed (contracted) and there is no gradual transition from fully illuminated (conscious) to not conscious (dark) (b). The dashed circle in b corresponds to the ‘threshold of consciousness’ of a healthy individual (see a). Thus the “area” between the illuminated circle (consciousness) and the dashed circle represents the area from which consciousness has been retracted in the hysterical patient. Contrary to a healthy individual the hysterical patient is not conscious of what abides in this area: the contents of this area are subconscious. Copyright 2019 by P. A. J. M. de Wit.

Apart from the question of what causes the dissociation of certain ideas, memories etc. and whether their dissociation is deliberate or reflexive, there is still another problem with this image. The analogy of the field of consciousness with a field of perception that can be contracted explains why personal consciousness is no longer *aware* of the ideas, memories, functions, intentions that now lie outside of this field of consciousness, but not why these mental contents and abilities are thereafter able to use the body of the patient to act themselves out – be it in the *absence* of the main personality (such as in somnambulism and fugues), or despite the *presence* of the main personality (such as in obsessions, paralyses,

amnesias, tics and spasms). If some form of consciousness is necessary for such symptoms, as Janet claimed (arguing that they can easily be distinguished from mere mechanical activity), do they take part of the main consciousness with them when they become dissociated, or how is this to be understood? The image of the mere *narrowing* or *contraction* of consciousness cannot explain this part of Janet's theory. At best it offers the ingredients for an incomplete model.

Therapeutic intervention

Janet didn't classify trauma as a separate pathology. As stated earlier he recognized that traumatic experiences were often the main cause of the pathologies he identified, but his classification of pathologies was based on insufficiencies in psychological *force* and *tension*. The *asthenic* conditions were pathologies based on insufficient psychological force, and Janet classified them broadly into three levels: mild, intermediate and severe asthenias. The symptoms of asthenia roughly coincide with the contemporary pathological condition of depression, while schizophrenia for instance, was considered a form of severe asthenia. *Hypotonic syndrome*, on the other hand, was due to insufficient psychological tension. This syndrome led to two types of symptoms: primary ones, resulting from the inability to accomplish psychological synthesis at certain levels, and secondary or derivative symptoms, resulting from excess of psychological force that could not be used at the right level due to insufficient tension (Ellenberger, 1970).

Like his diagnoses, Janet's therapeutic interventions were based on his evaluation of a patient's psychological force and tension. Janet considered sleep one of the main sources of reconstitution of psychological force. Thus when insufficient force was diagnosed the main therapeutic intervention was based on rest and optimizing sleep. Nutrition and stimulation of the skin were also considered important therapeutic tools for this class of conditions, as were the conscious regulation of social contact and perhaps a different working rhythm. Insufficient psychological tension required a different approach: firstly it was important to channel the excess of unused psychological force by engaging the patient in therapeutic activities, sports, or work at a proper psychological level. Secondly, psychological tension could be increased by stimulation (either chemical or psychological) and by training and education in which the level of activity was slowly increased.

Finally, for both types of conditions Janet placed great emphasis on what Ellenberger describes as the "liquidation of psychological debts": the "liquidation" of uncompleted psychological acts. "It is striking to see, when looking over the life histories of neurotic and mental patients, the number and the importance of inadequately terminated, nonliquidated

situations, among which mental disease itself can be ranged” (Ellenberger, 1970, p. 382). Subconscious fixed ideas, and traumatic memories belonged to this category of unliquidated acts. Janet used hypnosis, automatic writing and automatic speech to interact with his patient’s dissociated unliquidated acts. Ellenberger gives some interesting examples of how Janet tackled the fixed ideas of some of his hysterical patients, by substituting them with other, non-traumatic ideas by means of suggestion. But, most importantly, Janet didn’t just tackle the fixed ideas. He tried to treat the whole person by emphasizing rest, activity, therapeutic work, education, all to counterbalance the insufficiencies in psychological force and tension, which he considered the main problem.

References

- Amann-Gainotti, M. (1992). Contributions to the History of Psychology: LXXXV. Jean Piaget, Student of Pierre Janet (Paris 1919-1921). *Perceptual and Motor Skills*, 74, 1011-1015.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5 ed.). American Psychiatric Association.
<https://doi.org/10.1176/appi.books.9780890425596>
- Breh, D. C., & Seidler, G. H. (2007). Is peritraumatic dissociation a risk factor for PTSD? *Journal of Trauma & Dissociation*, 8, 53-69. https://doi.org/10.1300/J229v08n01_04
- Ellenberger, H. F. (1970). *The Discovery of the Unconscious: The History and Evolution of Dynamic Psychiatry*. Basic Books.
- Groddeck, G. (1923). *Das Buch vom Es: Psychoanalytische Briefe an Eine Freundin*. Internationaler Psychoanalytischer Verlag.
- Hilgard, E. R. (1977). The Problem of Divided Consciousness: A Neodissociation Interpretation. *Annals of the New York Academy of Sciences*, 296, 48-59.
- Janet, P. (1920). *The Major Symptoms of Hysteria: Fifteen Lectures Given in the Medical School of Harvard University* (2 ed.). The MacMillan Company.
- Meares, R. (1999). The Contribution of Hughlings Jackson to an Understanding of Dissociation. *American Journal of Psychiatry*, 156(12), 1850-1855.
- Moskowitz, A., Heim, G., Sallot, I., & Beavan, V. (2008). Pierre Janet on Hallucinations, Paranoia and Schizophrenia. In A. Moskowitz, I. Schäfer, & M. J. Dorahy (Eds.), *Psychosis, Trauma and Dissociation: Emerging Perspectives on Severe Psychopathology* (pp. 91-104). John Wiley & Sons.
- Oppenheimer, L. (1991). The Concept of Action: A Historical Perspective. In L. Oppenheimer & J. Valsiner (Eds.), *The Origins of Action: Interdisciplinary and International Perspectives* (pp. 1-35). Springer Verlag.

- van der Hart, O. (1995). Pierre Janet en Sigmund Freud over Hysterie, Trauma en Dissociatie. *Nederlands Tijdschrift voor Geneeskunde*, 139(43), 2183-2186.
- van der Hart, O., & Friedman, B. (1989). A Reader's Guide to Pierre Janet on Dissociation: A Neglected Intellectual Heritage. *Dissociation: Progress in the Dissociative Disorders*, 2(1), 3-16.
- van der Hart, O., & Horst, R. (1989). The Dissociation Theory of Pierre Janet. *Journal of Traumatic Stress*, 2(4), 1-11.
- van der Hart, O., Nijenhuis, E. R. S., & Steele, K. (2006). *The Haunted Self: Structural Dissociation and the Treatment of Chronic Traumatization*. W. W. Norton & Company.
- van der Hart, O., & van der Kolk, B. A. (1989). Pierre Janet and the Breakdown of Adaptation in Psychological Trauma. *American Journal of Psychiatry*, 146(12), 1530-1540.
- Vijselaar, J., & van der Hart, O. (1992). The First Report of Hypnotic Treatment of Traumatic Grief: A Brief Communication. *The International Journal of Clinical and Experimental Hypnosis*, XI(1), 1-6.

Appendix 7

Polyvagal theory

Although scientists working in the field of psychophysiology have pointed out a number of serious errors right at the core of it (Grossman & Taylor, 2007), Polyvagal theory has been, and is, very popular among therapists dealing with traumatized clients. It is also popular among clients themselves, because it offers a seemingly objective explanation for their experiences that centers completely around the human nervous system and the manner in which it is thought to have evolved. With that, Polyvagal theory can be positioned in the lower left quadrant of Figure 9 (Study 3). The cause of trauma is considered dispositional—and, like in Schauer and Elbert’s model, this is rather a general than an individual disposition, due to the organization of the nervous system—and its nature is purely biological.

At the start of his career as a psychological researcher in the late 1960s, Stephen Porges was involved in the early research of heart-rate variability and became one of the pioneers in the emerging field of psychophysiology (Porges, 2022). Apart from the autonomic nervous system and its relation to psychology, Porges’ interests included developmental and evolutionary psychology. Over the first twenty-odd years of his research Porges started to see that the evolution of species from fish and amphibians to reptilians and from reptilians to mammals was mirrored in the organization of the mammalian autonomic nervous system. This image was set off by neonatal peculiarities related to *respiratory sinus arrhythmia* (RSA)⁷⁴ and led to the development of *Polyvagal theory* (Porges, 2011).

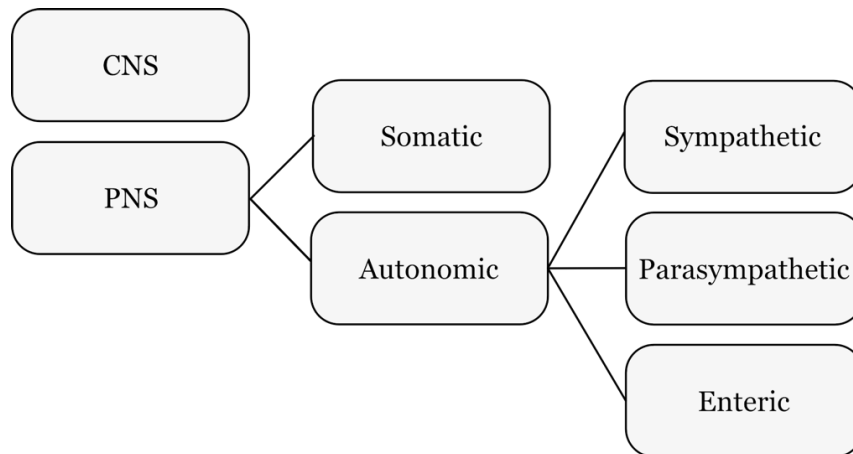
To appreciate Porges’ theory, here is a quick review of the traditional classification of the main branches of the mammalian nervous system (Figure A11). Anatomically we distinguish the *peripheral* nervous system (PNS), which spreads throughout the whole body; and the *central* nervous system (CNS), which consists of brain, brainstem and spinal cord. The peripheral nervous system can be further divided into the *somatic* nervous system and the *autonomic* nervous system. The somatic nervous system is believed to be responsible for the voluntary control of muscles, for movement and for touch, while the autonomic nervous system is believed to be responsible for involuntary or autonomic control of deeper bodily processes (i.e. the metabolic functions believed to maintain homeostasis). The autonomic nervous system itself can be further divided into a *sympathetic* branch, a *parasympathetic* branch and the *enteric nervous system*. Historically the sympathetic nervous system was

⁷⁴ Rhythmic variations in the heart rate correlated with the breathing rhythm.

named as such because it was believed to facilitate a concerted action or “sympathy” of the organs (Barboi, 2013). The term parasympathetic was first used in 1921 by John Newport Langley when he proposed this tripartite subdivision of the autonomic nervous system. Langley also was the first one to use the term autonomic nervous system (Johnson, 2013; Parent, 1996).

Figure A11

The traditional classification of the mammalian nervous system



Note. As schematic representation of the classification of the mammalian nervous system. Abbreviations: CNS—Central Nervous System; PNS—Peripheral Nervous System.

With regards to the defense cascade it is thought that the sympathetic branch of the autonomic nervous system (in concert with the HPA-axis⁷⁵) is responsible for the arousal associated with the *flight and fight response*, while the parasympathetic nervous system is

⁷⁵ An important role in the physiological stress response is played by what is called the *hypothalamic-pituitary-adrenal axis* (the HPA-axis). Together with the sympathetic nervous system the HPA-axis is believed to be responsible for the fight-and-flight response. In fact the HPA-axis and the SNS (the sympathetic nervous system) may be seen as two parts of one system (in his article about Voodoo death Cannon referred to it as the sympathico-adrenal system). The HPA-axis itself is a complex hormonal release system responsible for the secretion and release of, especially, *cortisol*. The basic mechanism as it is popularly understood is that when the hypothalamus receives certain input (which can come from quite a wide variety of sources), signaling that homeostasis has been compromised, it secretes and releases *corticotropin-releasing hormone* (CRH). CRH travels via dedicated blood vessels to the nearby *pituitary gland*, binding with its receptors. The pituitary gland then starts secreting *adrenocorticotropic hormone* (ACTH) and releases it in the general blood stream. When ACTH reaches the adrenal glands on the top of the kidneys, the adrenal glands start secreting cortisol. Once released in the blood-stream, cortisol has wide-ranging effects in the body, generally perceived as aimed at restoring homeostasis by enabling the body to deal with the stressor. Together with adrenaline and noradrenaline it is thought to be responsible for redistribution of energy (in the form of glucose) toward the critical organs and away from those that do not urgently need it during the fight- and flight- (or stress-) response. Adrenaline, noradrenaline and cortisol interact in a highly complex manner during the fight/flight/stress response and, apart from the above mentioned redistribution of energy, their joint influence is believed responsible for increased heart-rate, more efficient breathing and reduced pain-perception. There is a negative feedback-loop in the HPA-axis that *terminates* the increased production of cortisol: secretion of CRH by the hypothalamus is *inhibited* when cortisol binds to its receptors due to increased levels of *free* cortisol in the blood stream crossing the blood-brain barrier. This is thought to occur when cortisol is no longer required to help the body deal with the stressful situation. Inhibition of the secretion of CRH in the hypothalamus results in down-regulation of ACTH secretion in the pituitary gland. This in turn leads to a reduction in cortisol secretion by the adrenal glands.

responsible for advanced stages of immobility (see Figure 10, Study 3). The enteric nervous system is believed to be involved in the regulation of gastric movements, digestive secretions and gastric blood-flow.

Stephen Porges's phylogenetic⁷⁶ theory suggests a modification in the traditional classification for that part of the autonomic nervous system which in the higher vertebrates branches out in a sympathetic and a parasympathetic branch. Initially, in the lowest species of vertebrates there was (and still is) only *one* system, a system equivalent to what in the higher vertebrates evolved into the parasympathetic nervous system; then—according to Porges—as the class of vertebrates evolved further, the autonomic nervous system first differentiated into *two* and later into *three* sub-systems. According to Porges each of these sub-systems has a distinctive role in the regulation of the physiological processes that underlie defensive behavior. Furthermore—again according to Porges—the highest of these three sub-systems, which only developed fully in higher mammalian species, also regulates the physiological processes involved in *social engagement*. Porges: “These phylogenetic principles provide a basis for speculations regarding the behavioral and physiological responses associated with mammalian social and emotional behavior, which is neurophysiologically and behaviorally linked to adaptive stress and coping strategies” (Porges, 2001, p. 129)

In humans and higher mammals the three sub-systems of the autonomic nervous system that Porges proposed are anatomically represented by the following neural structures:

- I. The *dorsal vagal complex* (DVC). The *nervus vagus*, or vagus nerve is the tenth cranial nerve. It is the largest nerve in the body and it connects to all main organs. The *dorsal* (or posterior) part of the vagal nerve innervates the *viscera* - the digestive organs below the diaphragm. This dorsal part of the vagus nerve is unmyelinated and is sometimes also called the *primitive vagus*. From an evolutionary point of view this is the oldest part of the autonomic nervous system and, according to Porges, goes back furthest through the line of vertebrates, all the way down to certain species of jawless fish. Under normal circumstances this part of the vagus is associated with digestion (and taste), but under unfavorable circumstances it regulates the metabolic processes towards immobilization and shutdown and its main purpose then becomes the conservation of energy. It greatly reduces the heart-rate and the use of oxygen.

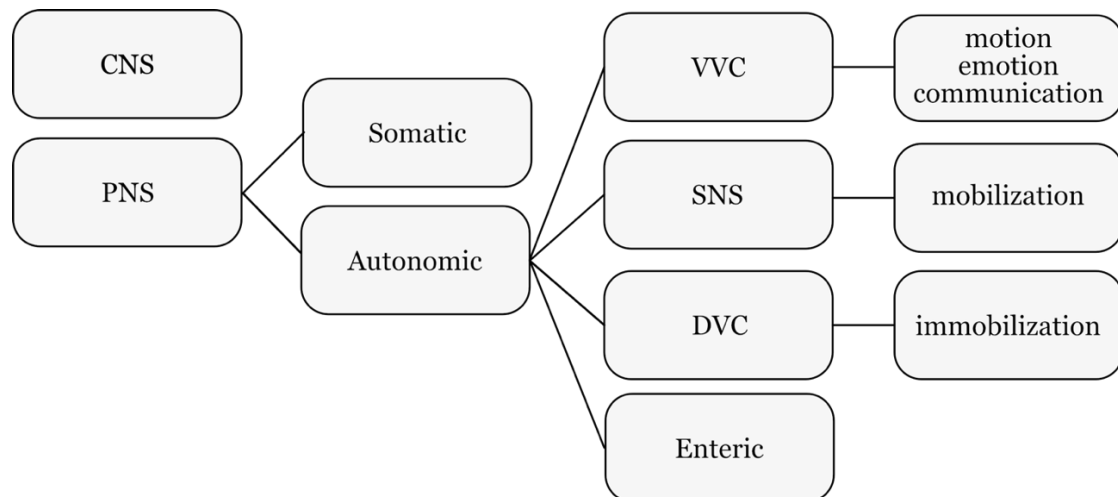
⁷⁶ *Phylogenesis* refers to the development and diversification of a species or group of organisms, or of a particular feature of an organism, as a result of evolutionary adaptation. Phylogenesis. In. (2015). *New Oxford American Dictionary*.

- II. The *sympathetic nervous system* (SNS). According to Porges, from an evolutionary point of view this was the second sub-system that developed. It first emerged with the reptiles. In mammals this sub-system works in concert with the HPA-axis of the endocrine system and together they induce heightened states of arousal through increase of the heart- and respiration-rates and through the release of glucose. They also stimulate the sweat-glands to produce sweat. They thereby enable *mobilization* of the organism, up to the level of the high-energy muscle-action that is necessary during the *flight* and the *fight* responses. Following Hughlings Jackson's evolution based hierarchical model (see Figure A2, Appendix 5), the sympathetic nervous system *inhibits* the activity of the DVC.
- III. The *ventral vagal complex* (VVC). Phylogenetically this is the youngest part of the autonomic nervous system. It emerged only in higher mammalian species. This ventral (or anterior) part of the vagus complex innervates muscles in the face, the jaws, the neck, the larynx, the pharynx and the middle ear and also has extensions to the salivary and tear glands and to the heart and the bronchi. It is *myelinated* and is also called the *smart vagus*. Because it branches out to and regulates the parts of the organism that enable communication and related social behaviors, Porges proposes that this part of the autonomic nervous system forms the *physiological basis for social engagement*. In fact Porges goes as far as calling social behavior (including communication and *love*) an *emergent property* of this vagal sub-system (Porges, 2001; W. Porges, 1998). The ventral vagal complex also serves as the neurological basis for self-soothing and calming behaviors. When active, the VVC *inhibits* over-excitation of the organism by the sympathetic-adrenal system. In fact the VVC is capable of a much more fine-tuned regulation of the heart-rhythm than the older sub-systems and under normal circumstances it increases and decreases the heart-rate according to the moment-to-moment needs of the socially active mammal and without the costs that either an all-out *activation* by the SNS or *shutdown* by the DVC would incur.

As his theory about the phylogenetic adaptation of the autonomic nervous system involves a differentiation of the parasympathetic nervous system into *vagal complexes* Stephen Porges has called it the *Polyvagal theory*. The theory calls for a rearrangement of the way in which the organization of the nervous system has been classified. It changes the older classification of the part of the autonomic nervous system branching out into a sympathetic branch and a parasympathetic branch into a *threefold* system (see Figure A12).

Figure A12

A classification of the nervous system updated with polyvagal theory.



Note. A schematic representation of the classification of the nervous system according to Polyvagal theory. Also shown are the main behavioral effects of its sub-systems. Abbreviations: CNS—Central Nervous System; PNS—Peripheral Nervous system; VVC—Ventral Vagal Complex; SNS—Sympathetic Nervous System; DVC—Dorsal Vagal Complex.

A hierarchical response strategy to environmental challenges

The development of the polyvagal theory in the middle of the 1990s was based on 40 years of research by Porges and others of *heart rate variability*. Heart rate variability is the beat-by-beat variation in the heart rate during resting conditions due to input by the autonomic nervous system. Porges inferred that measurements of heart rate variability provide “windows” to physiological states related to the different degrees of influence on the heart rate by the different components of the autonomic nervous system and this is what led him to the conceptualization of the polyvagal theory. Porges further proposed that changes or shifts in physiological “state” influence a person’s perception of the environment as *safe*, as *unsafe* or as *life-threatening* and lead to social engagement behaviors and to defensive behaviors (fight/flight or shutdown) respectively (Porges, 2001).

Building on Hughlings Jackson’s principle of the evolution-based hierarchical organization of the nervous system (see Appendix 5), Porges proposes that when humans or higher mammals encounter environmental challenges that require a behavioral response they rely on a *hierarchical response strategy* that is based on the three sub-systems. Depending on the severity of the challenge the most recently developed sub-system (the VVC) is employed first. The *ventral vagal complex* provides the neurological mechanisms for signaling and communication and if the challenge is perceived as *threatening* it will encourage resolution by employing *social engagement strategies*. If the threat is severe or cannot be resolved by

employing the VVC, this sub-system will *shut down*, making space for the next sub-system to step in: the *sympathetic nervous system* (in fact the VVC will stop *inhibiting* the SNS). When engaged, the sympathetic nervous system prepares the organism for *mobilization* and leads it into the *flight* and/or *fight response*. In case the sympathetic nervous system can't handle the threat successfully, it will be shut down too, which leaves resolution of the threat in the hands of the most primitive sub-system: the *dorsal vagal complex*. The DVC induces *immobilization* and, as already mentioned, its main goal is conservation of energy by greatly reducing the heart-rate and the oxygen consumption. If the DVC stays in control of the organism for too long the organism is likely to die—this is what Richter referred to as *vagus death* in his article about the sudden death phenomenon (Richter, 1957, see Study 3).

According to Porges, reptiles, who developed the capacity for sympathetic arousal as well as parasympathetic immobilization (but not for social engagement, since they didn't develop the VVC), are much better adapted to cope with an activated DVC than most mammals are. Mammalian brains and bodies are *oxygen hungry* and not able to cope for longer periods with the severe shutdown orchestrated by the DVC. Reptiles can survive much longer in low-oxygen conditions. Furthermore, the deceleration of the heart-rate due to employment of the DVC is often accompanied by strong arrhythmias in the heart-rhythm and this too is believed to be more dangerous for mammals than it is for reptiles. In short: the mammalian and human organism can only survive the full engagement of the DVC for short periods without serious repercussions.

Porges discusses the articles of Walter Cannon and Curt Richter about *Voodoo death* and the *sudden death phenomenon* mentioned in Study 3 and he concludes as follows—at the same time providing a summary of the above:

The polyvagal theory places Richter's and Hofer's⁷⁷ observations in perspective. Following the Jacksonian principle of dissolution, the rodents would exhibit the following sequence of response strategies: (1) removal of VVC tone; (2) increase in sympathetic tone; and (3) a surge in DVC tone. It appears that the more docile domestic rats in Richter's experiment progressed from a removal of VVC tone, to an increase in sympathetic tone, and then died via exhaustion. However, the profile of

⁷⁷ In 1970 Myron Hofer published a report on experiments involving several species of recently captured wild rodents displaying prolonged immobility. He found that during immobility the heart-rate would decelerate considerably and often show considerable arrhythmia (this was species-dependent). The heart-rate would decelerate even more when exposed to a predatory stimulus or during flaccid immobility. He observed that the respiration-rate would *increase*, but become extremely shallow. See: Hofer, M. A. (1970). Cardiac and Respiratory Function During Sudden Prolonged Immobility in Wild Rodents. *Psychosomatic Medicine*, 32(6), 633-648.

the wild rats was different. Being totally unaccustomed to enclosures and handling, and also having their vibrissae cut, a mobilization strategy driven by increased sympathetic tone was not functional. Instead, these rats reverted to their most primitive system to conserve metabolic resources via DVC. This strategy promoted an immobilization response characterized by reduced motor activity, apnea, and bradycardia. Unfortunately, this mode of responding, although adaptive for reptiles, is lethal for mammals. Similarly, the onset of feigned death, as described by Hofer, illustrates the sudden and rapid transition from an unsuccessful strategy of struggling, requiring massive sympathetic activation, to the metabolically conservative immobilized state, mimicking death, associated with the DVC.

These data suggest that the vagus contributes to severe emotion states and may be related to emotional states of immobilization, such as extreme terror. Application of the polyvagal approach enables the dissection of vagal processes into three strategic programs: (1) when tone of the VVC is high, there is an ability to communicate via facial expressions, vocalizations, and gestures; (2) when tone of the VVC is low, the sympathetic nervous system is unopposed and easily expressed to support mobilization, such as fight or flight behaviors; and (3) when tone from DVC is high, there is immobilization and potentially life-threatening bradycardia, apnea, and cardiac arrhythmias. (Porges, 2001, p. 136)

Polyvagal theory and the defense cascade

When comparing the hierarchical response to threatening circumstances described in Porges's polyvagal theory with the different stages of the *defense cascade* it provides a good fit. Although the polyvagal theory doesn't fully discuss the first stage of *alert immobility* Porges *does* indicate that *orientating* behavior is part of the social engagement behavior associated with the ventral vagal complex. The tendency of herd animals and humans to refer to group behavior as a first response to a possible threat can likewise be explained by pointing to the social engagement behavior promoted by the VVC. Subsequently sliding down the defense cascade from alert immobility to flight, fight and finally to advanced stages of immobility is quite elegantly explained by the shutting down of higher sub-systems of the autonomic nervous system and the disinhibition of the next sub-system in line. In reverse: once the threatening circumstances have been resolved the higher sub-systems of the autonomic nervous system come back "online" and inhibit the dominance of the more primitive ones—thereby following the evolutionary development of the autonomic nervous system from primitive vertebrates to reptiles and from reptiles to higher mammals.

Apart from a proper explanation of alert immobility the most significant part of the defense cascade that is *lacking* a proper explanation in polyvagal theory is the function and mechanism of *tonic* immobility. The polyvagal theory refers to immobility *in general* without differentiating between tonic and flaccid immobility. However, since its emphasis is on shutdown and the conservation of energy and the theory doesn't concern itself with muscle-tone, one might conclude that it refers more to what we have called *flaccid* immobility than to the stage of *tonic* immobility.

References

- Grossman, P., & Taylor, E. W. (2007). Toward understanding respiratory sinus arrhythmia: Relations to cardiac vagal tone, evolution and biobehavioral functions. *Biological Psychology*, 74, 263-285. <https://doi.org/10.1016/j.biopsycho.2005.11.014>
- Hofer, M. A. (1970). Cardiac and Respiratory Function During Sudden Prolonged Immobility in Wild Rodents. *Psychosomatic Medicine*, 32(6), 633-648.
- Johnson, J. O. (2013). Chapter 12 - Autonomic Nervous System Physiology. In H. C. Hemmings & T. D. Egan (Eds.), *Pharmacology and Physiology for Anesthesia* (pp. 208-217). W.B. Saunders. [https://doi.org/https://doi.org/10.1016/B978-1-4377-1679-5.00012-0](https://doi.org/10.1016/B978-1-4377-1679-5.00012-0)
- Parent, A. (1996). *Carpenter's Human Neuroanatomy* (9th ed.). Williams & Wilkins.
- Phylogenesis. In. (2015). *New Oxford American Dictionary*.
- Porges, S. (2001). The polyvagal theory: phylogenetic substrates of a social nervous system. *International Journal of Psychophysiology*, 42(2), 123-146.
- Porges, S. (2011). *The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation*. W. W. Norton & Company.
- Porges, S. W. (1998). Love: An Emergent Property of the Mammalian Autonomic Nervous System. *Psychoneuroendocrinology*, 23(8), 837-861. [https://doi.org/https://doi.org/10.1016/S0306-4530\(98\)00057-2](https://doi.org/10.1016/S0306-4530(98)00057-2)
- Porges, S. W. (2022). Heart Rate Variability: A Personal Journey. *Applied Psychophysiology and Biofeedback*, 47, 259-271. <https://doi.org/10.1007/s10484-022-09559-x>
- Richter, C. P. (1957). On the Phenomenon of Sudden Death in Animals and Man. *Psychosomatic Medicine*, 19(3), 191-198.