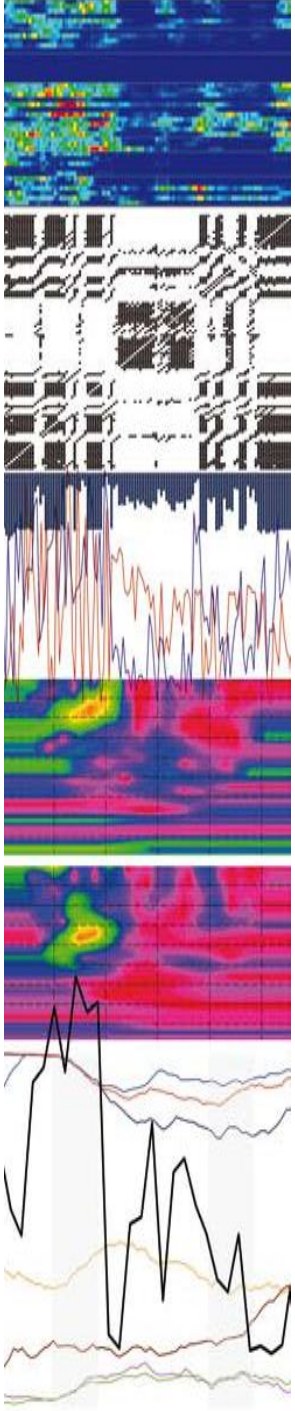

European Psychotherapy Association

Vienna

Psychotherapy as a Self-Organizing Process

Personalized Process Monitoring by the Synergetic Navigation System

Günter Schiepek

PARACELSUS
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Institute of Synergetics and Psychotherapy Research
University Hospital Salzburg - Christian Doppler Medical Center

Evolutionary Steps in Psychotherapy

- **Schools and confessions**
- **Disease-related treatment programs**
- **Personalized psychotherapy: individualization of treatments and assessment, process-sensitive procedures**

Uncertainty, Complexity, Instability

- **are unavoidable**
- **characterize living systems (not only in a VUCA world)**
- **drive change**

- **Complexity implicates dynamics and individuality**

Chaos implicates limited predictability

Chaos implicates flexibility and adaptivity

Transformation is self-organization -> implicates critical instabilities

Integration of the Medical Model and the Common Factors Model by the „Facilitation of Self-Organization Model"

Medical Model

1 Disorder, problem or complaint

2 Explanation for the problems/disorders (biological)

3 There exist mechanisms of change that are consistent with the explanation for the disorder

4 The mechanisms of change suggest that particular therapeutic actions should be used

5 The therapeutic action is responsible for the benefits of the psychotherapy and not other factors, such as the alliance with the therapist

Common Factors Model

The common factors model emphasize the collaborative work of therapist and client, and thus there is a focus on the therapist, the client, the transaction between them, and the structure of the treatment that is offered.

Self-Organization Model

1 Psychotherapy supports self-organization processes

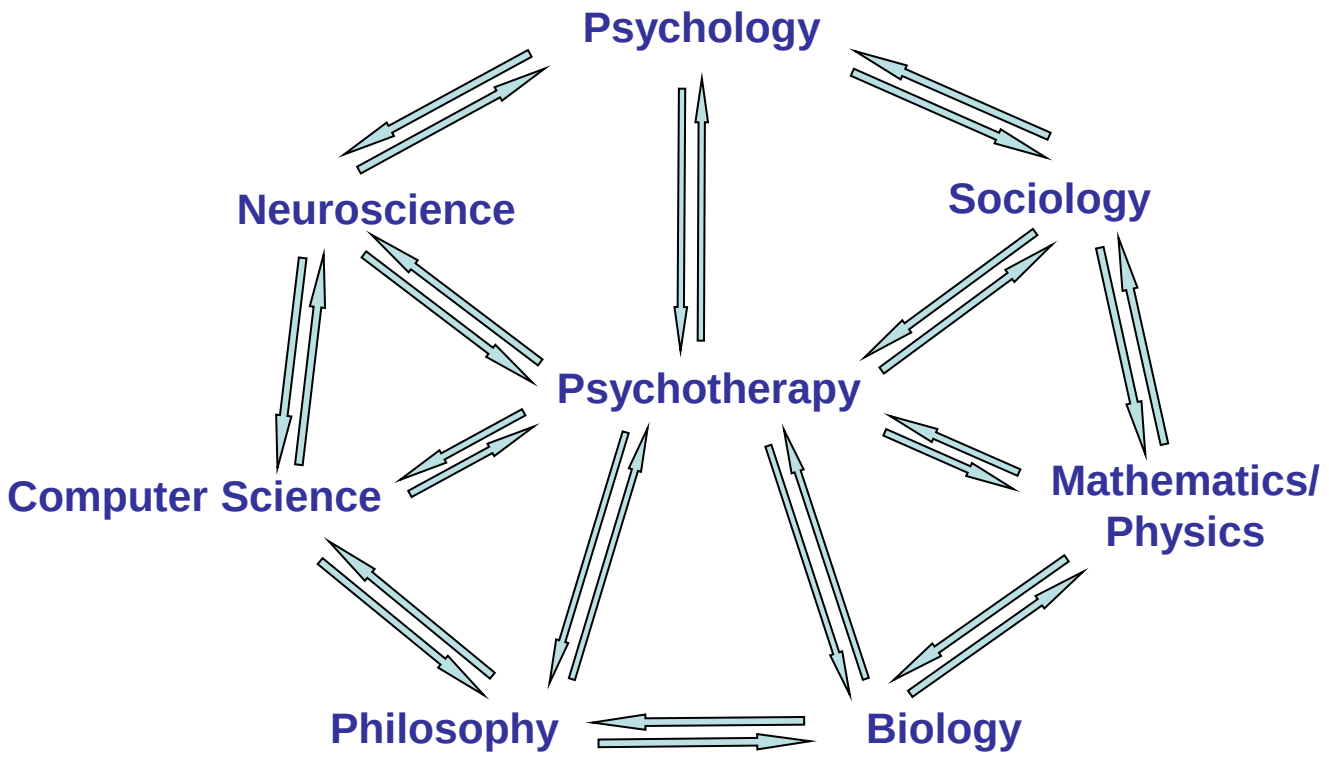
2 Most common factors are integrated into the concept of generic principles (conditions for self-organizing processes), and thus they are „specific" (in the sense of theoretically founded)

3 There is no input-output mechanism of therapeutic actions (techniques)

4 There is an understanding of intra-systemic mechanisms of systems re-organization

Psychotherapy as applied transdisziplinarity

with the theory of complex nonlinear systems as a meta-theoretical framework



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Gottfried Wilhelm Leibniz:

„unitatis multiplicem“

„Einheit in der Vielheit“

Psychotherapy Integration
Criteria and Components

- **Metatheory / Scientific Paradigm**
- **Theory of change – The "explanandum" is the process**
- **Multi-perspective case formulation (idiographic system modelling)**
- **A pool of interventions (eclectic at this level)**
- **Criteria (heuristics) for therapeutic (micro-)decisions**
- **Monitoring and feedback of change dynamics**
- **Quality and outcome assessment in everyday routine practice**
- **A concept of therapeutic competences and skills**
- **Bridging the gap between practice and science (practice-based research and basic research, scientist-practitioner model)**

Integrative Psychotherapy

A Feedback-Driven Dynamic Systems Approach

This book introduces a new, integrative, systemic approach to psychotherapy and counseling and shows how the principles of dynamic complex systems can guide everyday clinical work.

Our mental, interpersonal, and biological (e.g., neuronal) systems are complex and nonlinear, and allow spontaneous pattern formation and chaotic dynamics. Their self-organizing nature sometimes maneuvers the systems into pathological states. However, the very same principles can be utilized therapeutically to encourage change for the better. The feedback-driven nonlinear dynamic systems approach described here basically attempts to facilitate positive self-organizing processes, such as order transitions, healthy patterns of behavior, and learning processes.

In addition to describing the theory and evidence supporting this new approach, the authors use an extensive case study to illustrate how the principles of dynamic complex systems can guide everyday clinical work. They show how modeling and monitoring of the client's systems and an empirical description of their patterns allow the therapist to individually fine-tune therapeutic techniques to support the client's progress. Fine-meshed feedback based on real-time data and time series analysis is at the core of the approach, and so an internet-based monitoring system – the Synergetic Navigation System (SNS) – that helps capture dynamic processes and guide practitioners' therapeutic decisions is also outlined.

"An exciting new way of thinking about the psychotherapeutic process that will be of great interest to clinicians and researchers alike."

Adele M. Hayes, Professor, Department of Psychological and Brain Sciences, University of Delaware, Newark, DE

"Integrates the science and art of psychotherapy while providing a new perspective on the complexities of self-initiated change and therapy-facilitated change. If the reader wants to read an entirely novel approach to therapy that incorporates frequent assessment and feedback, this is a must read."

Michael J. Lambert, PhD, Susa Young Gates University Professor of Psychology, Brigham Young University, Provo, UT

"This book is a precious contribution in defining with clarity the new shape of psychotherapy to come. Definitely a must read to understand how much complexity science can be a revolution in human change."

Franco F. Orsucci, MD DPsych, Professor, University College London, UK, and Institute for Complexity Studies, Rome, Italy

ISBN 978-0-88937-472-0

HOGREFE

G. Schiepek · H. Eckert
B. Aas · S. Wallot · A. Wallot

Integrative Psychotherapy

HOGREFE

Günter Schiepek · Heiko Eckert
Benjamin Aas · Sebastian Wallot · Anna Wallot

Integrative Psychotherapy

A Feedback-Driven Dynamic Systems Approach

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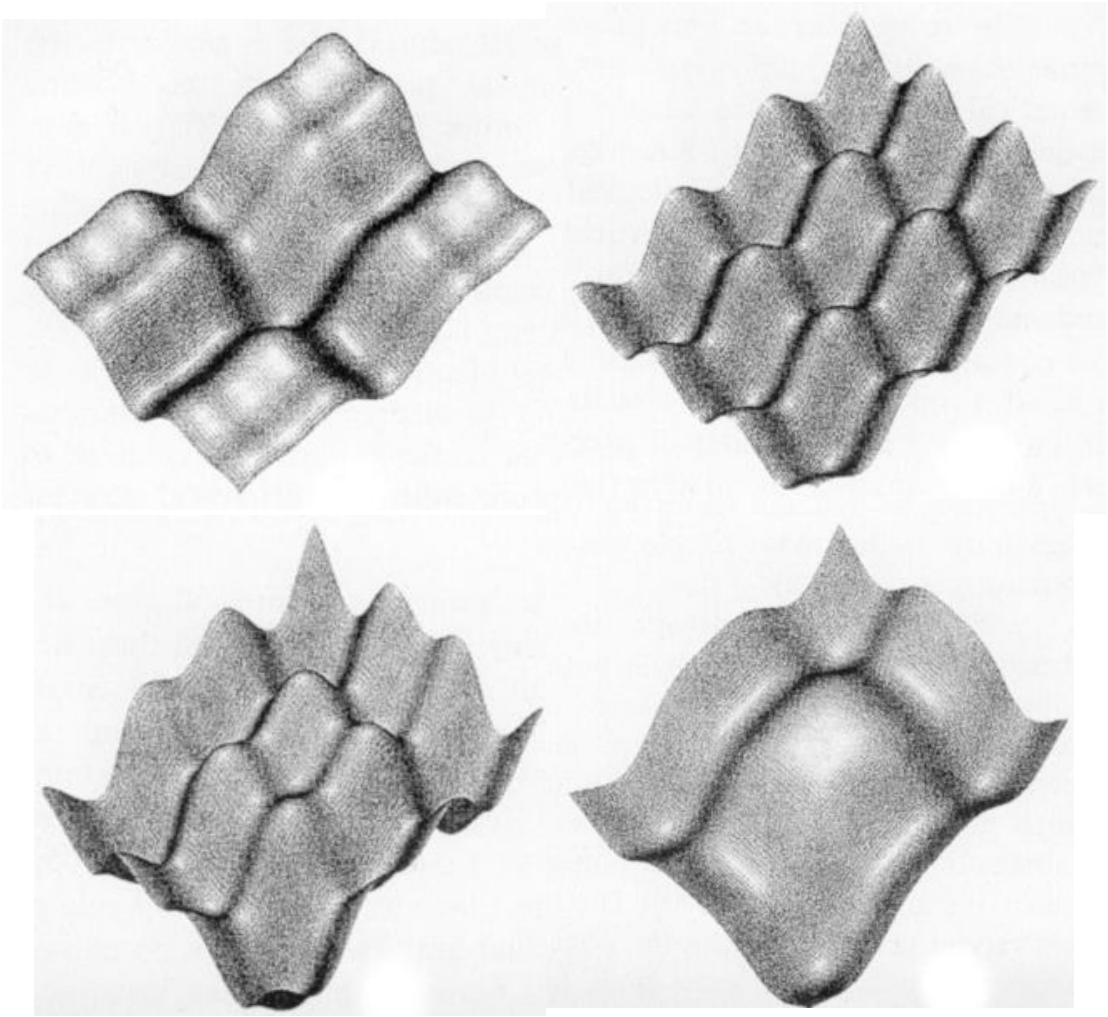
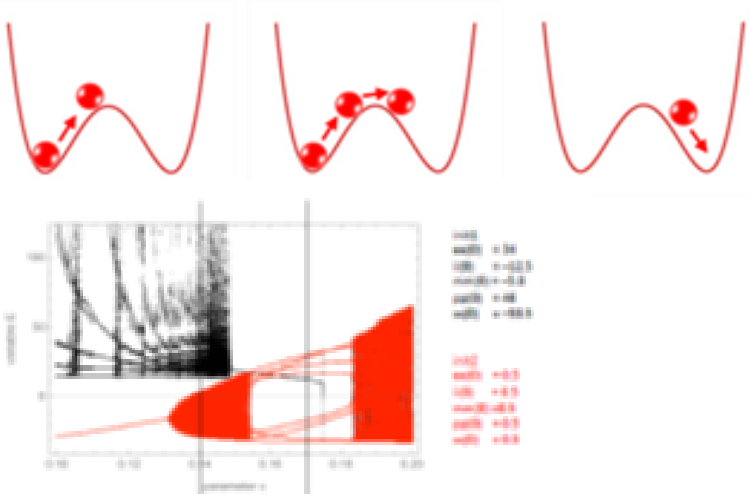
Change of a potential landscape (by parameter drift)



Two different concepts of intervention

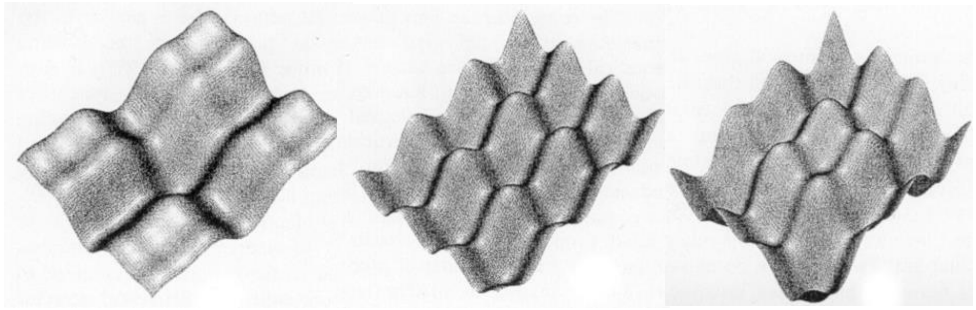
Bistability (multistability)

different attractors can be reached from different initial conditions or from different local system states (induced by noise – exploring the landscape – or by specific interventions)



Change of a potential landscape

representing the available attractors of a person („personality") by parameter drift. Cave: In general, there is no direct way to change personality parameters (dispositions, competencies, „traits") but indirct ways by the concrete experiences of a person (implicit or explicit learning)



The generic principles of self-organization

1. Realize a context of stability
Structural and emotional security, trust, self-esteem, and self-efficacy

2. Identify the patterns of the system under consideration
Identification of the system boundaries;
description and analysis of patterns and dynamics

3. Meaningfulness, coherence, and life-style
Are change processes related to personal values,
life-styles, and dimensions of meaning

4. Identify control parameters / energies / activation
Conditions of motivation; activate ressources;
correspondence to important goals and plans; emotions

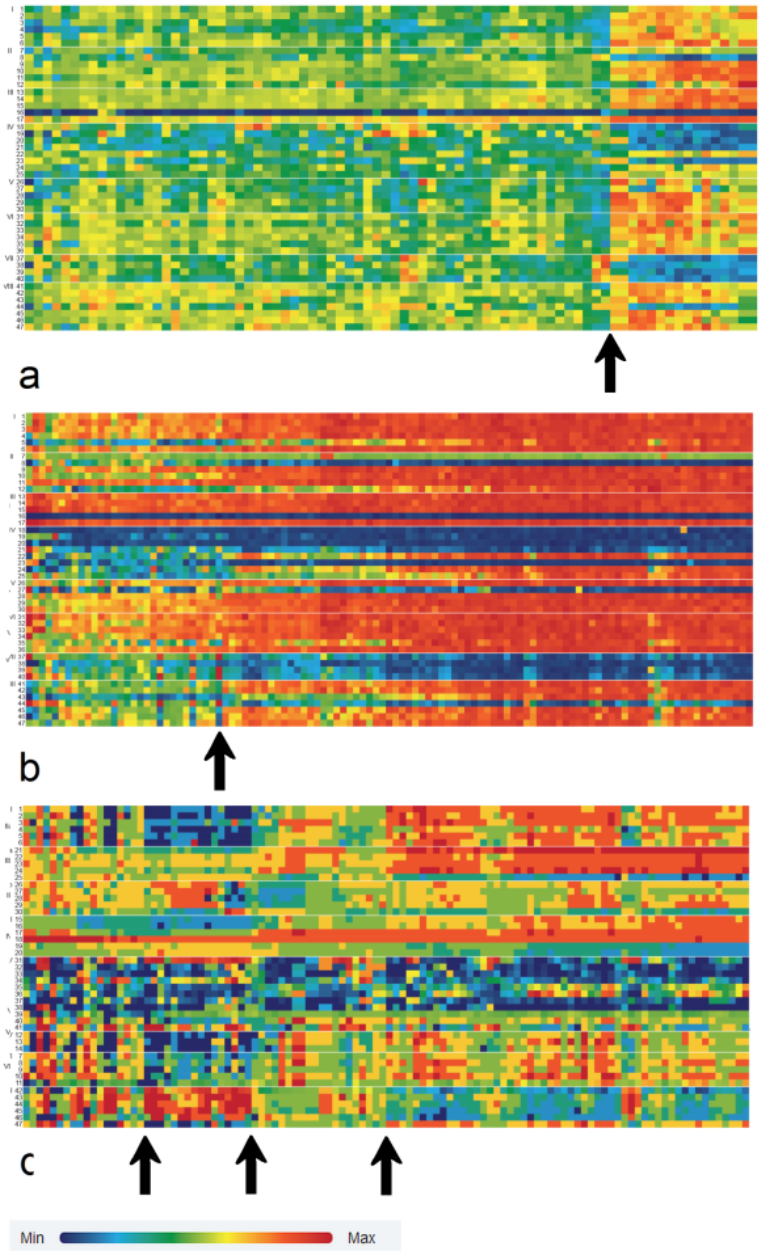
5. Destabilization / deviation amplifying feedback
Experiments; techniques of behavior change; cognitive restructuring;
all differences to be experienced

6. "Kairos" / resonance / synchronization
Coordination of therapists behavior, rhythms,
and style of communication to those of the client(s)

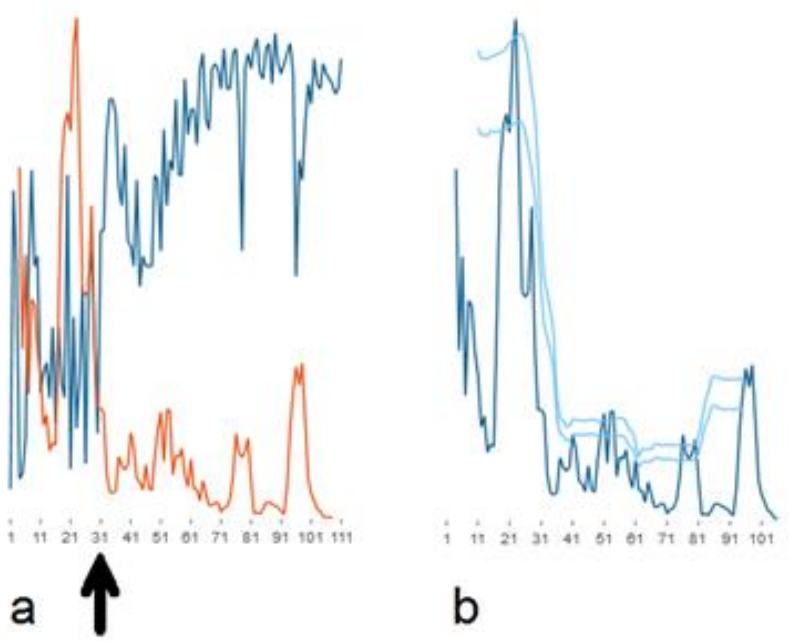
7. Intentional symmetry breaking
Anticipation and goal directed realization elements of new patterns

8. Re-Stabilization
Stabilization, integration, and generalization of new patterns

Order Transitions visualized by Colored Raw Diagrams

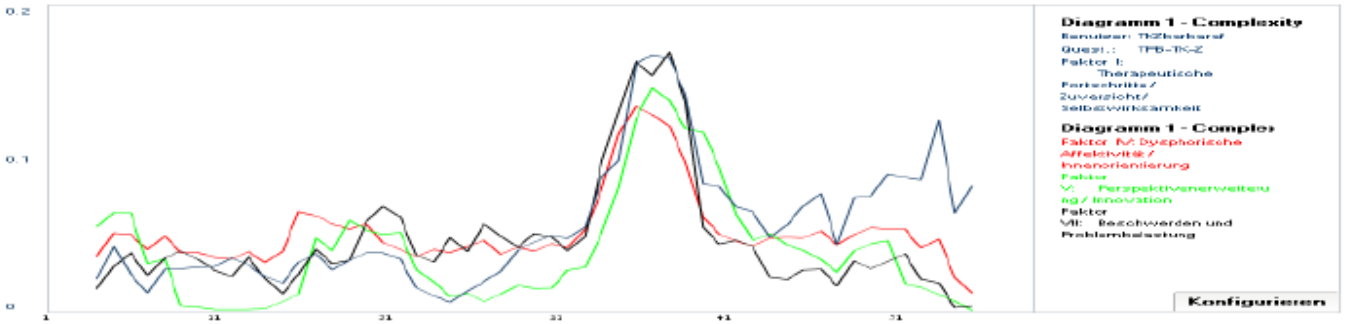


Indikatoren und Precursors von Ordnungsübergängen: Dynamische Komplexität



Therapy process of an OCD-patient in a day treatment center

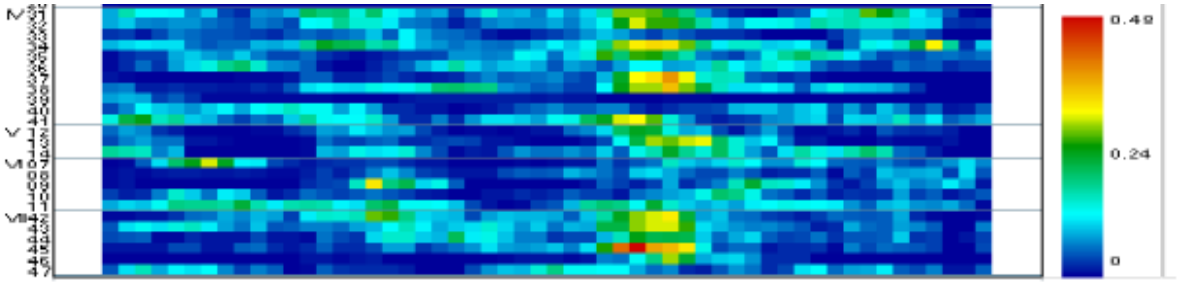
Dynamic Complexity



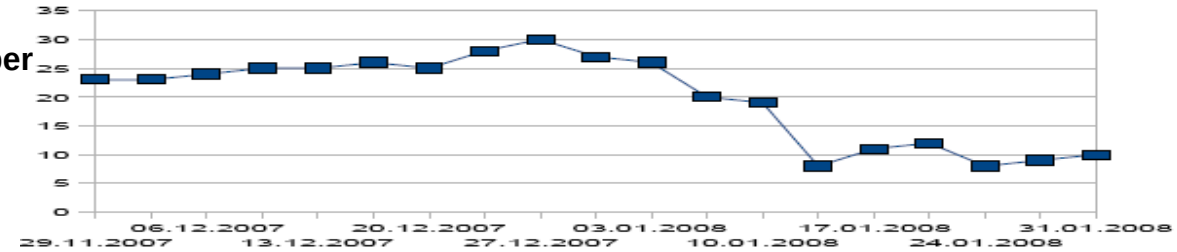
Flooding

Crit. Instability

Complexity-Resonance-Diagram



Y-BOCS (two times per week)



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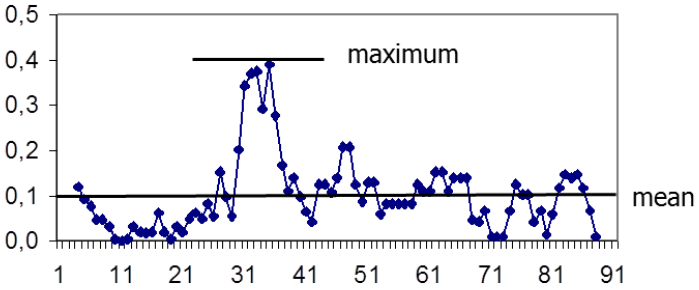
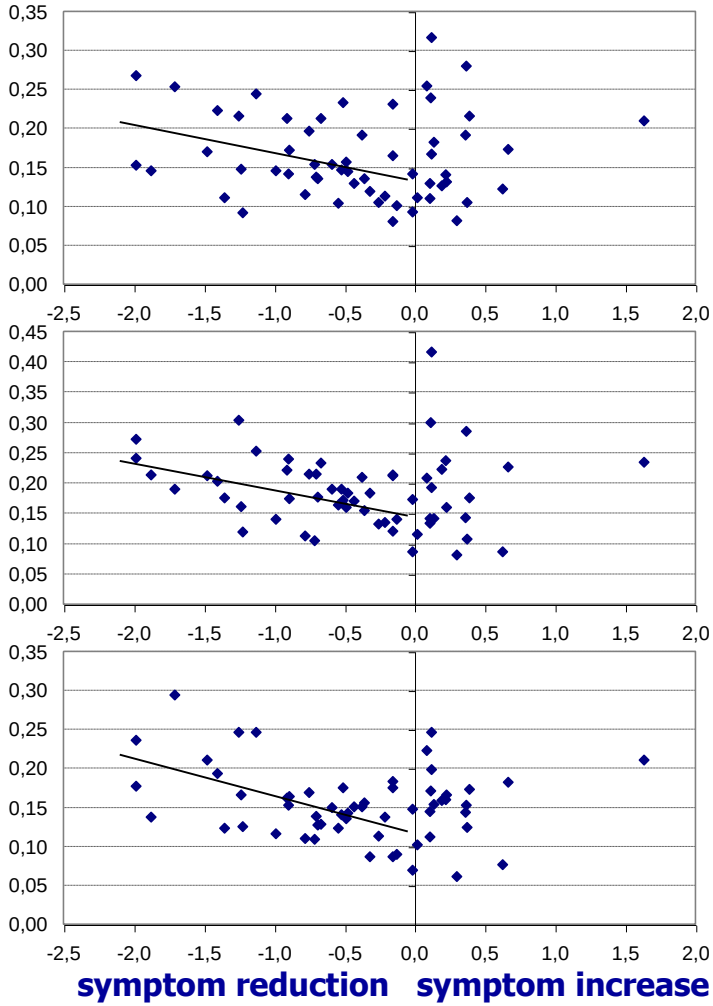
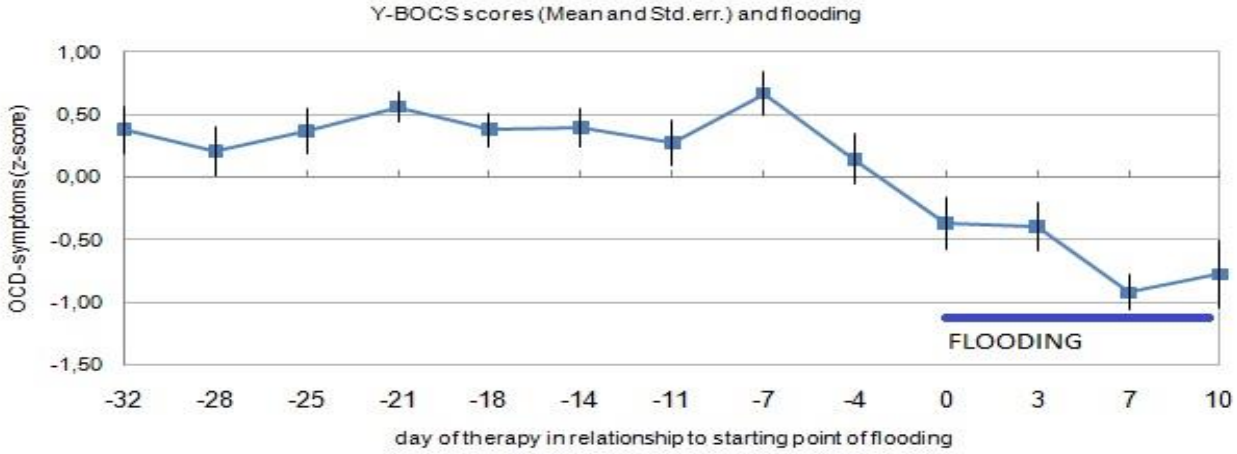
Intensity of critical instability (local peak of dynamic complexity) and therapy outcome are correlated in „responders“ Schiepek et al. (2001)





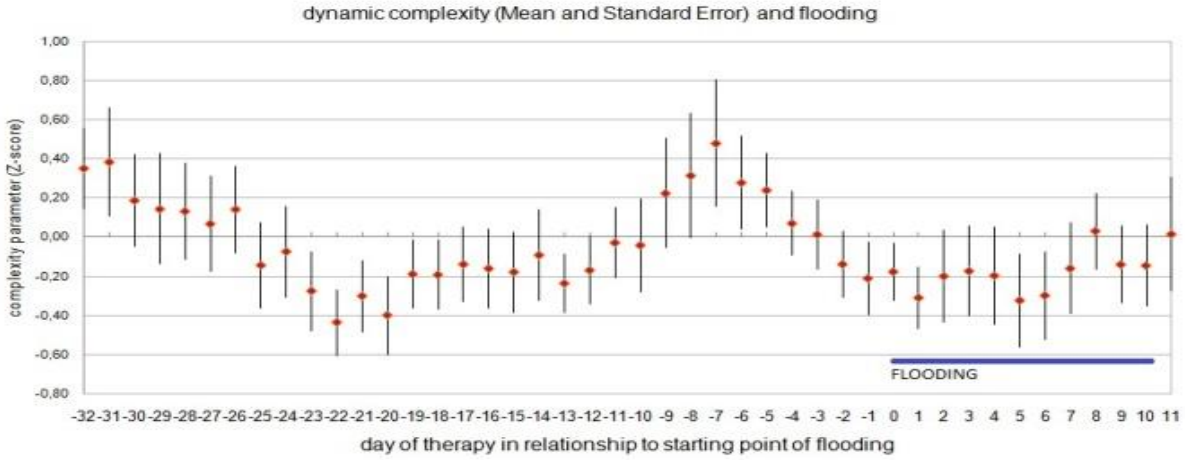
Mean course of symptom severity (Y-BOCS, z-transformed)



Mean course of dynamic complexity (z-transformed)

normalized in relation to the beginning of Exposure/ Response Prevention in the CBT of N=18 OCD patients (day treatment center Munich). vertical bars: standard error

(Heinzel, Tominschek & Schiepek, 2014)



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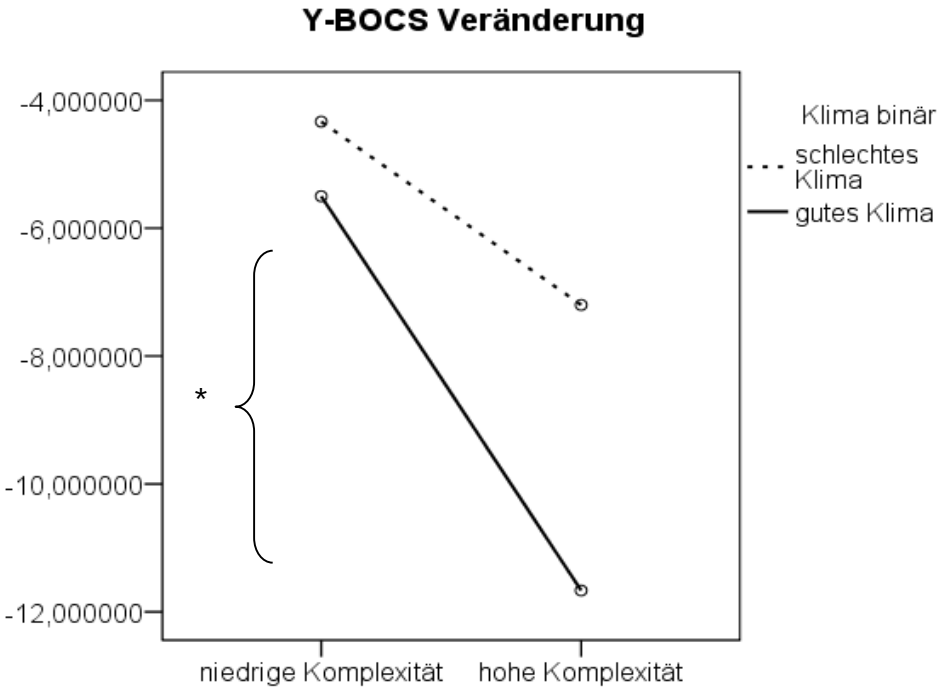
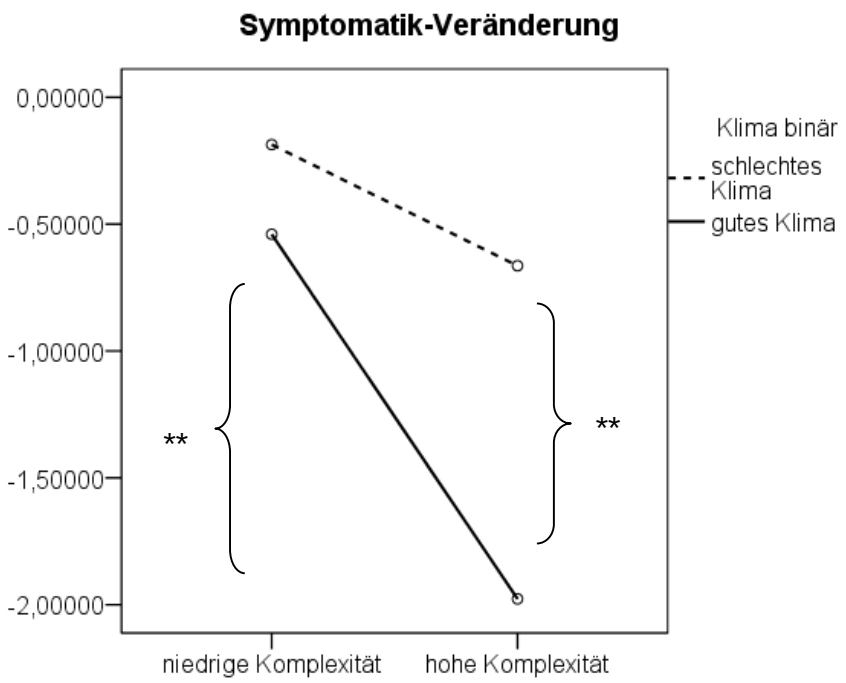
The contribution of the ward atmosphere (stability of the boundary conditions) and local dynamic complexity (critical instability) to the therapy effect



Interaction between ward atmosphere (stable boundary conditions) and local complexity (degree fo critical instability).

Y-axis: reduction of Y-BOCS-score



Interaction between ward atmosphere (stable boundary conditions) and local complexity (degree of critical instability).

Y-axis: reduction of symptom severity (TPQ-scale)

Empirical Article

Clinical Psychological Science
1–11

DOI: 10.1177/2167702619865969
www.psychologicalscience.org/CPS

Critical Fluctuations as an Early-Warning Signal for Sudden Gains and Losses in Patients Receiving Psychotherapy for Mood Disorders

DE and TC

Merlijn Olthof[1], Fred Hasselman[1,2], Guido Strunk[3,4,5], Marieke van Rooij[1], Benjamin Aas[6], Marieke A. Helmich[7], Günter Schiepek[8,9], and Anna Lichtwarck-Aschoff[1]

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Psychotherapy Research

Routledge
Taylor & Francis Group

ISSN: 1050-3307 (Print) 1468-4381 (Online) Journal homepage: https://www.tandfonline.com/loi/tpsr20

Destabilization in self-ratings of the psychotherapeutic process is associated with better treatment outcome in patients with mood disorders

Merlijn Olthof, Fred Hasselman, Guido Strunk, Benjamin Aas, Günter Schiepek & Anna Lichtwarck-Aschoff

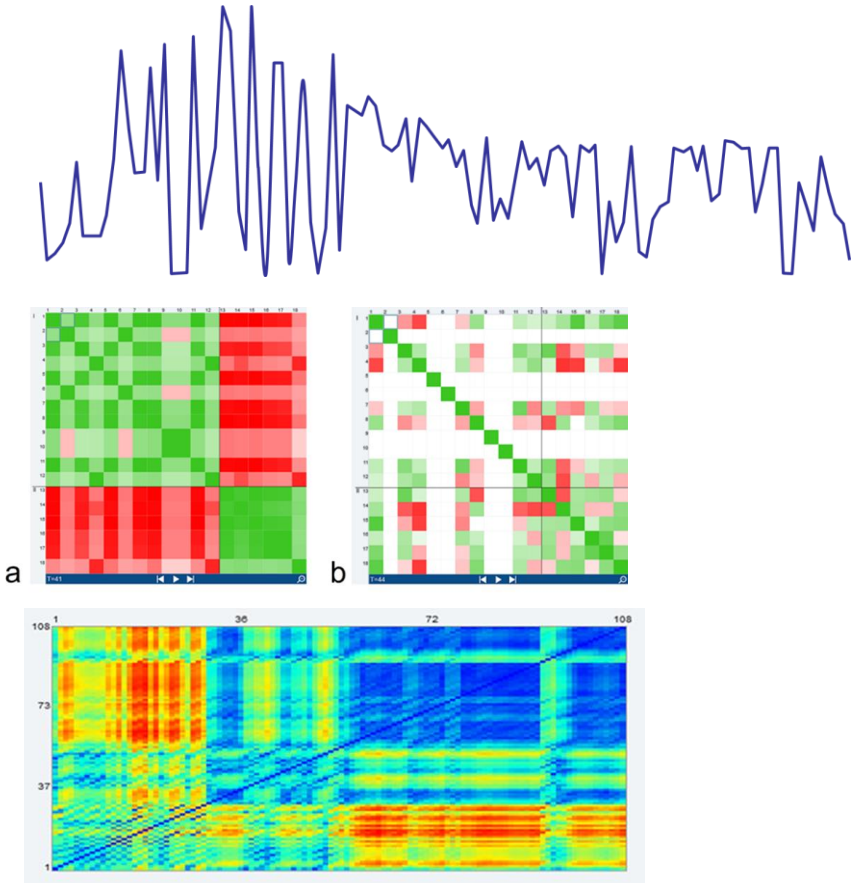
To cite this article: Merlijn Olthof, Fred Hasselman, Guido Strunk, Benjamin Aas, Günter Schiepek & Anna Lichtwarck-Aschoff (2019): Destabilization in self-ratings of the psychotherapeutic process is associated with better treatment outcome in patients with mood disorders, Psychotherapy Research

To link to this article: https://doi.org/10.1080/10503307.2019.1633484

What is outcome?

Pre-post differences assessed by mean scores at specific time points

Changes of dynamic patterns



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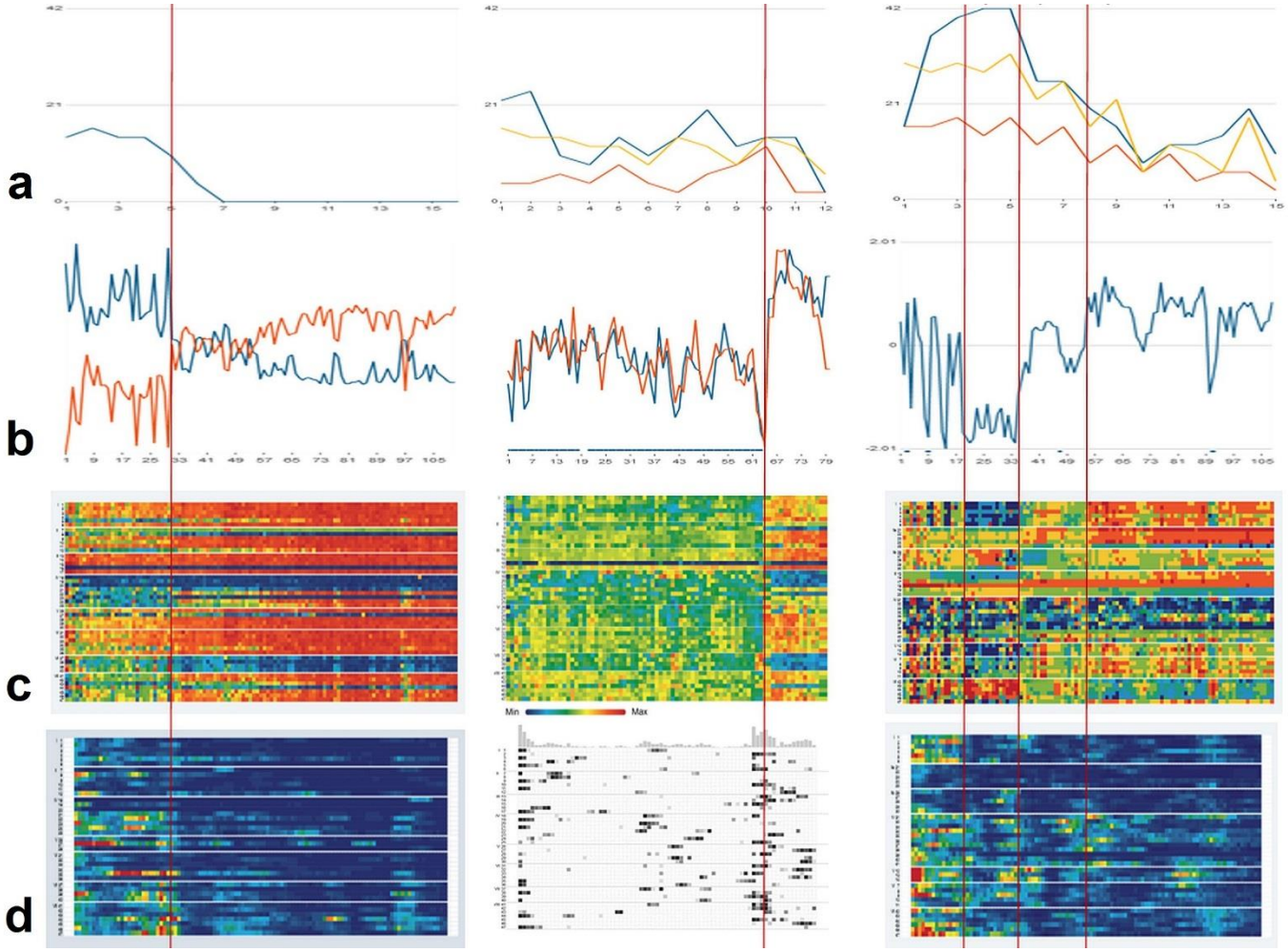
Order transitions in psycho-therapeutic processes



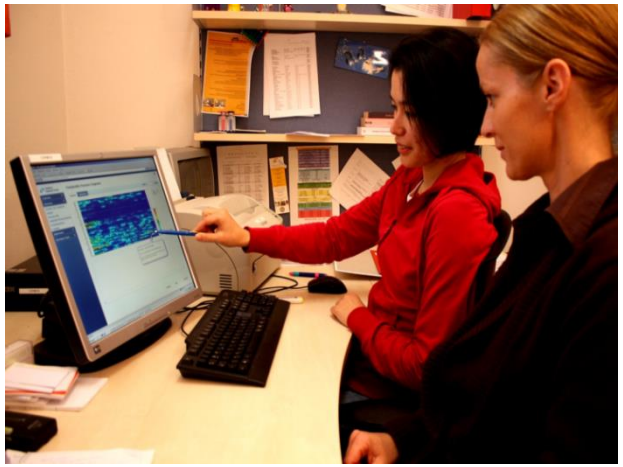
Prozessuale Muster psychotherapeutischer Veränderung. Vertikale Linien: Ordnungsübergänge. Links und rechts: Patient mit Zwangsstörungen; Mitte: Patient mit chronifizierter Depression (s. Schiepek et al., 2018). (a) Wöchentliche Symptomeinschätzungen DASS-21 (Nilges & Essau, 2015). Links: Subskala Depression; Mitte und rechts: Subskalen Depression (blau), Stress (gelb) und Angst (rot). (b) Tägliche Selbsteinschätzungen (TPB-R). Links: Symptom- und Problemintensität (blau) und Achtsamkeit/Körpererleben (rot); Mitte: Therapeutische Fortschritte/Zuversicht/Selbstwirksamkeit (blau) und Achtsamkeit/Körpererleben (rot); rechts: Therapeutische Fortschritte/Zuversicht/Selbstwirksamkeit (blau). (c) Rohdaten-Farbdiagramme. Blautöne: niedrige Werte, Orange- und Rottöne: hohe Werte von 47 in Zeilen angeordneten Items des TPB-R. (d) Komplexitäts-Resonanz-Diagramme. Links und rechts: Farbdiagramme (Blautöne: niedrige dynamische Komplexität, Orange- und Rottöne: hohe dynamische Komplexität) von 47 in Zeilen angeordneten Items des TPB-R. Mitte: Schwarz-Weiss Komplexitäts-Resonanz-Diagramm. Dunkelgraue und schwarze Pixel bedeuten hohe dynamische Komplexität.

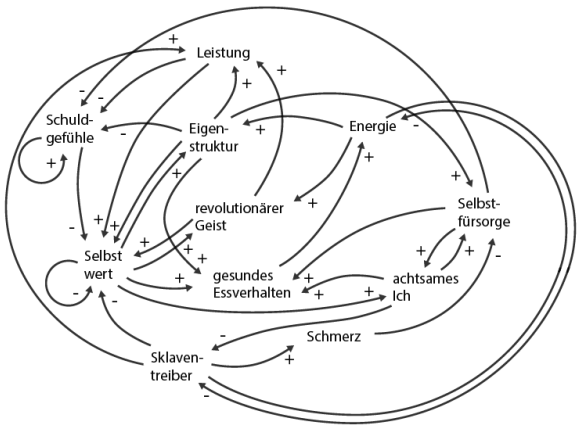
Feedback-loops of real-time monitoring based psychotherapy

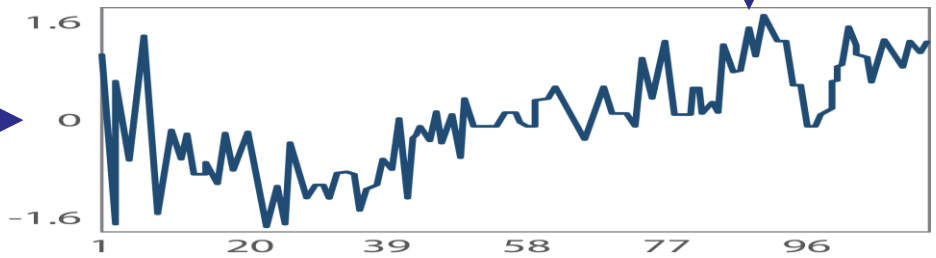
Idiographic system modeling

process monitoring

continuous cooperative process control







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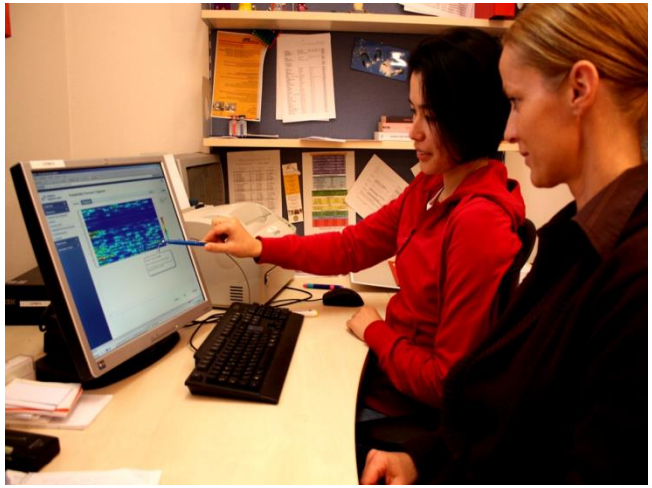
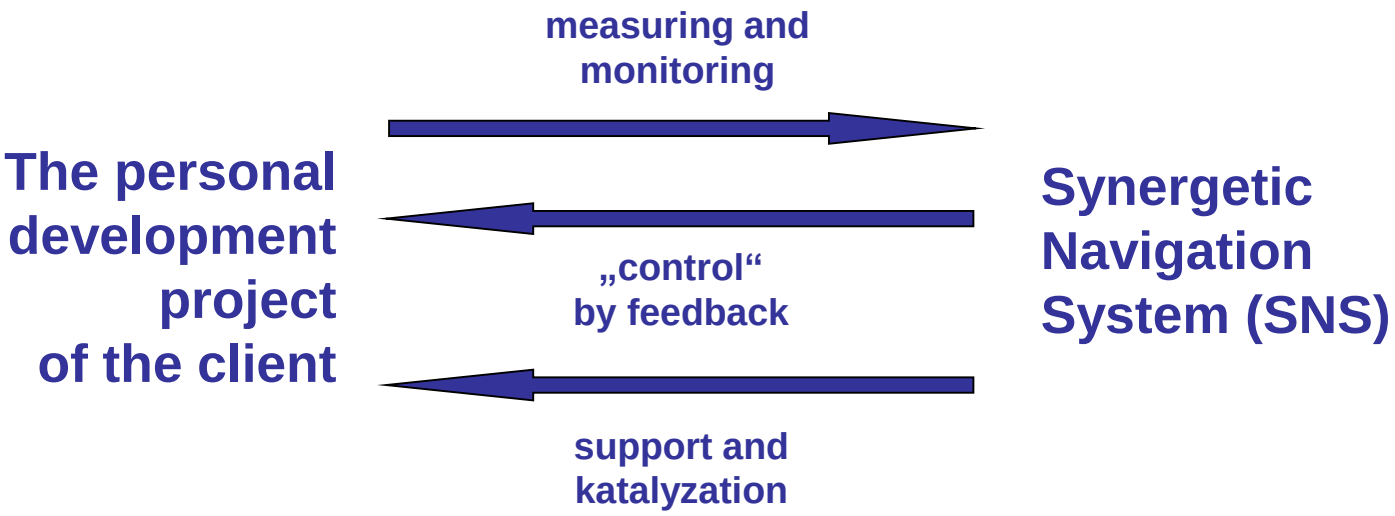
Continuous Cooperative Process Control

A realization of therapeutic self-organization





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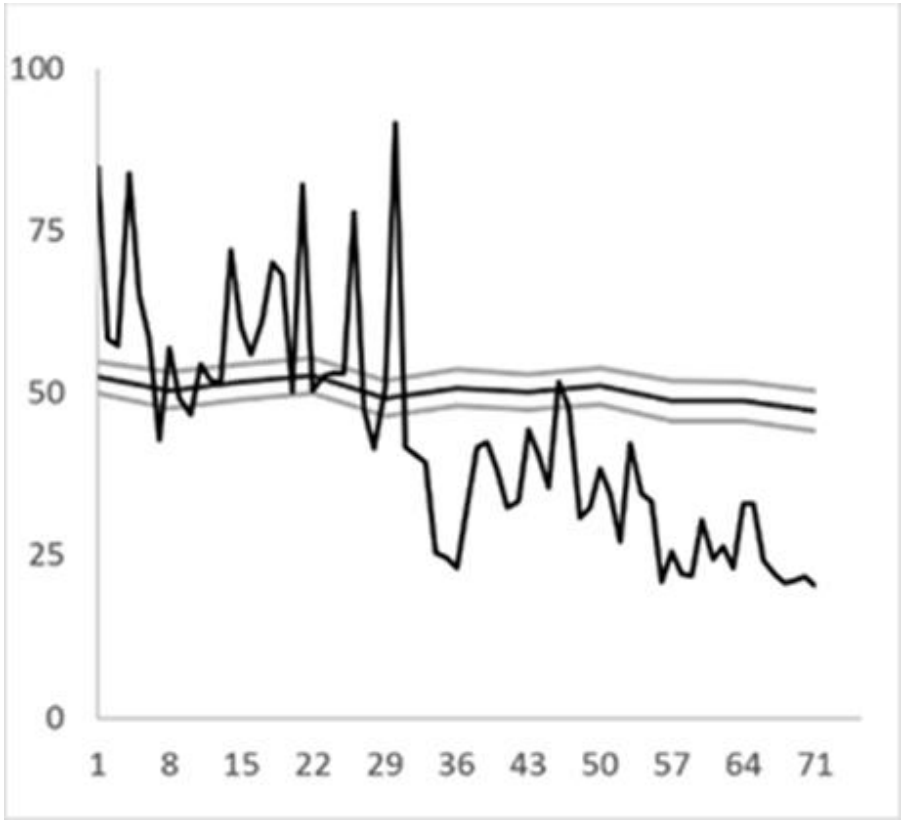
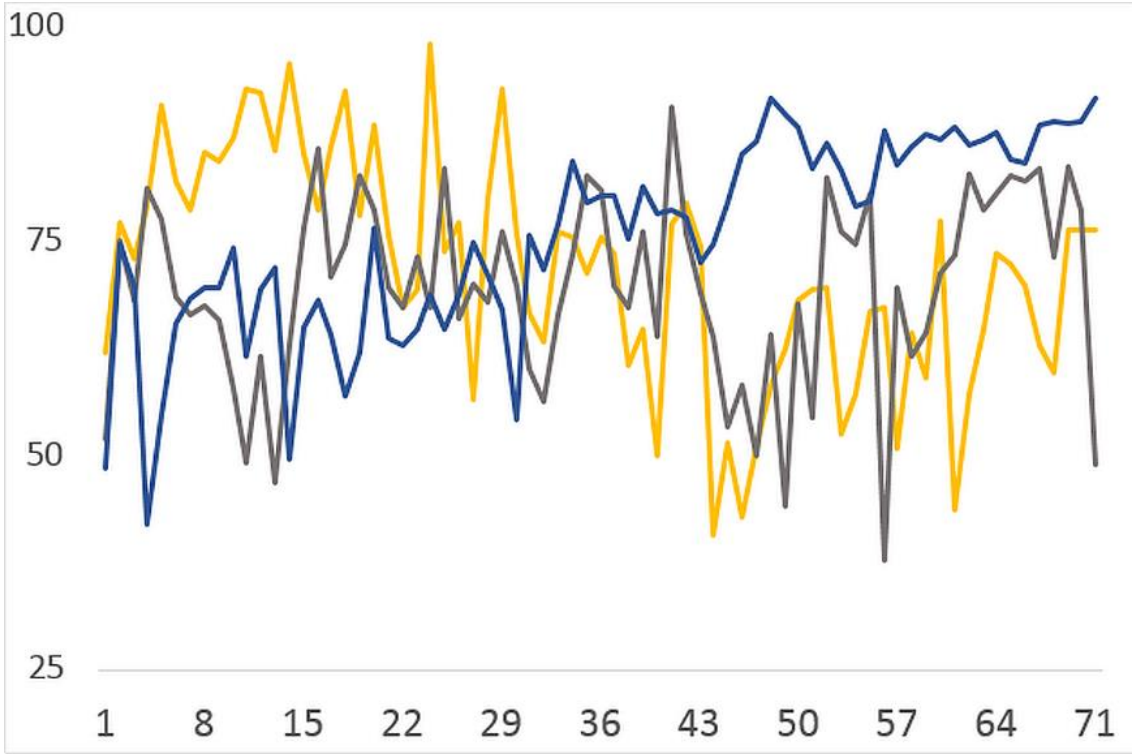
„On Track“ or „Not on Track“ – this is the question

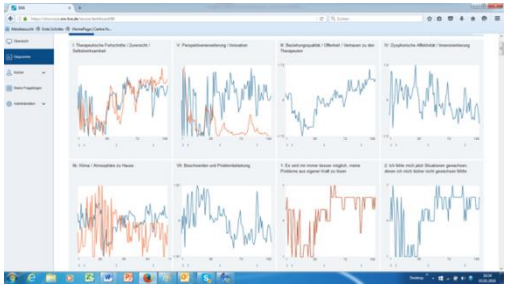


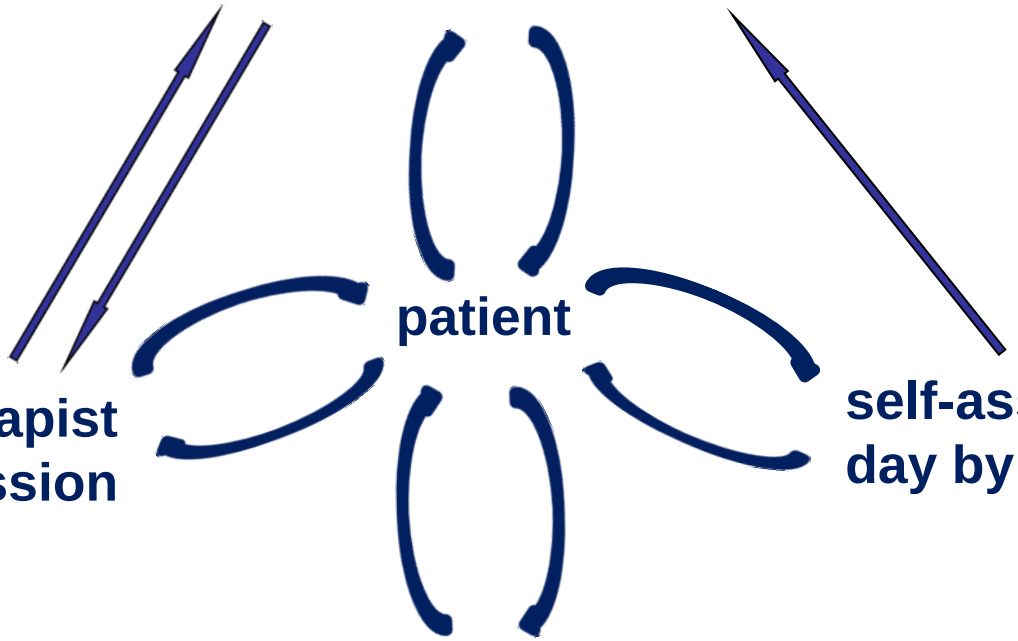
The Butterfly Effect

demonstrated by time series of the TPQ-R Factor „Problem and Symptom Severity“ (P)



Psychotherapy:
A process of feedback-driven mentalization and action





identification of patterns
without the quality of qualia

adaptive indikation:
data-driven decisions on interventions

confidence

theory- based reconstruction
of ongoing processes

confirmation of the therapeutic progress

confidence

valid feedback

enhanced motivation

experience of self-efficacy

enhanced self-regulation of
behavior and emotions

therapist

patient

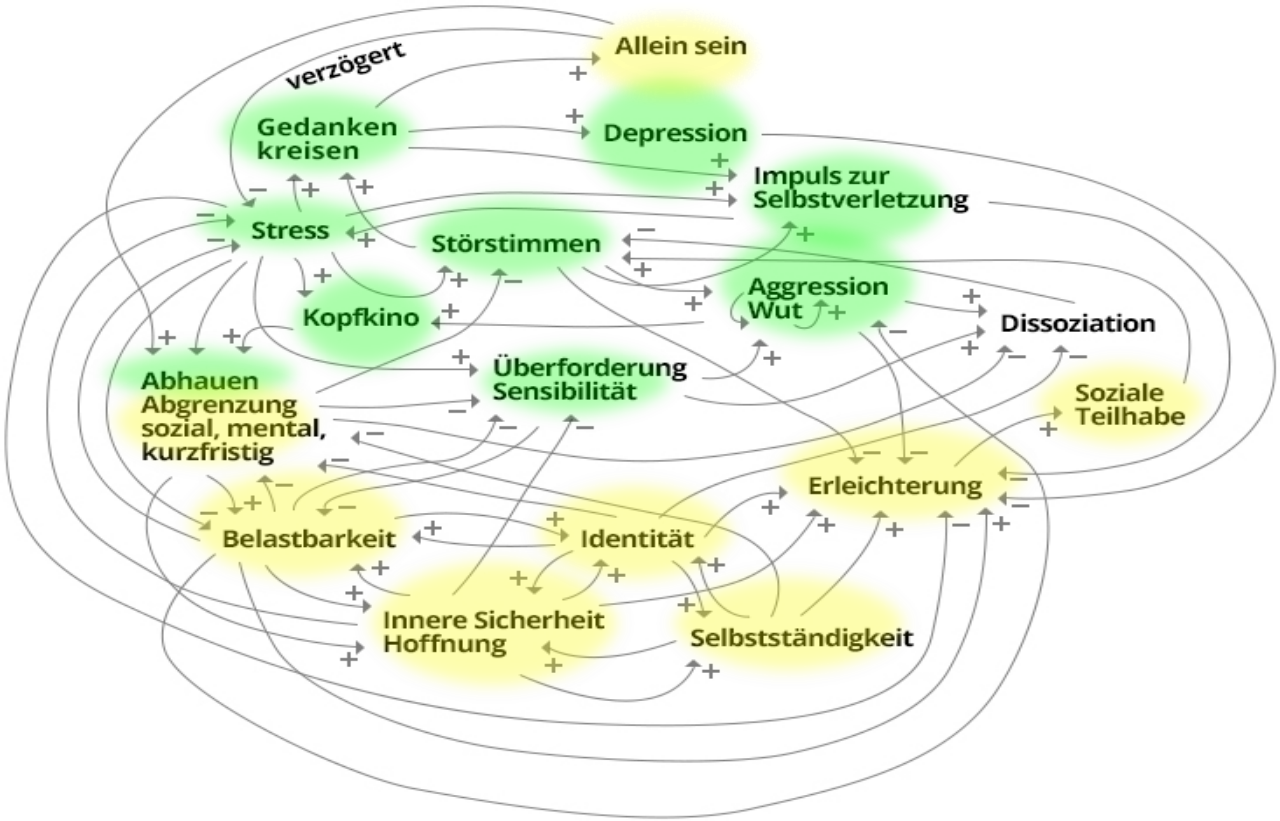
differentiated
self-awareness
of mental states

the classic interactional

and self-referential loops

perception of
emotions, emotional learning

Frau A., Idiographische Systemmodellierung



Wording idiographic systems model client I 2015

Die 18 begrifflichen Komponenten („Variablen“) des idiographischen Systemmodells von Frau I. Sie wurden zwei thematischen Kategorien zugeordnet, die in ihrem individuellen Fragebogen als Subskalen fungieren und über die zugehörigen Items zu aggregierten Zeitreihen führen.

Stress und Stressverarbeitung (Entspricht dem Ego-State „Kind“)

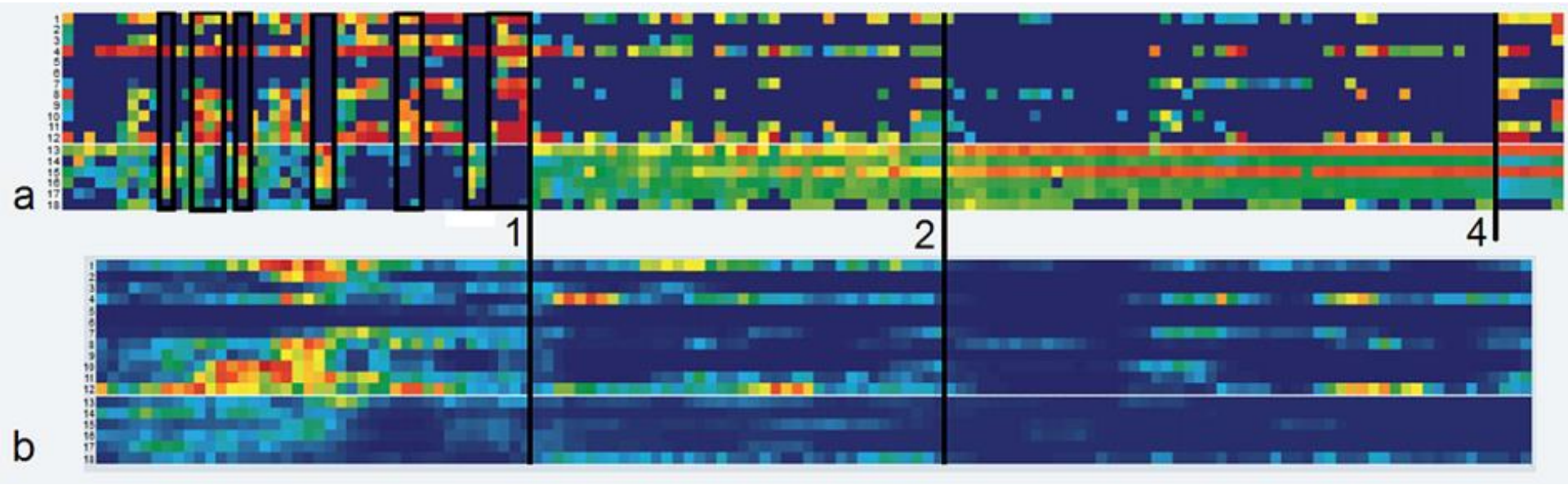
- **Heute habe ich Stress erlebt**
- **Heute war es notwendig, mein Kopfkino zu aktivieren**
- **Heute bin ich weggesaust - dissoziiert**
- **Heute war es für mich wichtig, alleine zu sein**
- **Heute wurde ich von der Depression mitgerissen**
- **Der Impuls zur Selbstverletzung war für mich heute …**
- **Das Gedankenkreisen war für mich heute …**
- **Die Störstimmen waren für mich heute …**
- **Mein Aggressionspegel war heute …**
- **Mein Wutpegel war heute …**
- **Heute fühlte ich mich überfordert**
- **Mein Bedürfnis nach Abgrenzung war heute …**

Positive Ziele und Identitätsentwicklung (entspricht dem Ego-State „Erwachsene“)

- **Meine Belastbarkeit war heute …**
- **Mein Gefühl der inneren Sicherheit war heute**
- **Mein Empfinden von Selbstständigkeit war heute …**
- **Das Gefühl für meine innere Identität war heute …**
- **Mein Gefühl der Erleichterung war heute …**
- **Meine Teilnahme am sozialen Leben war heute …**

Pattern of ego-state dynamics in a BPD client with dissoziative personality disorder

De-synchronizing order transitions



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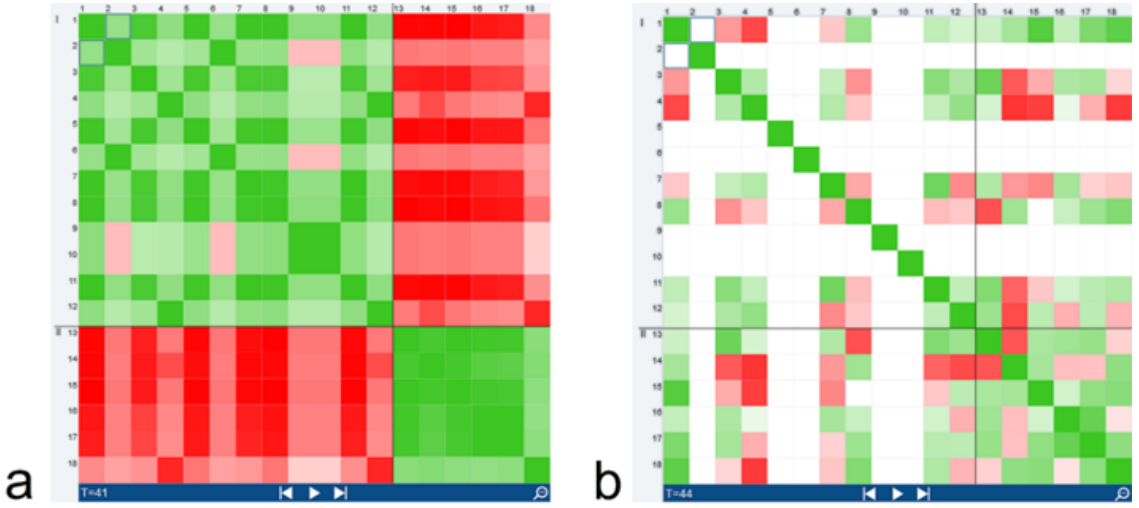
Increase of symptom severity and inter-item synchronization (absulute averaged correlation) at phase transitions

Order transition of ego-state dynamics



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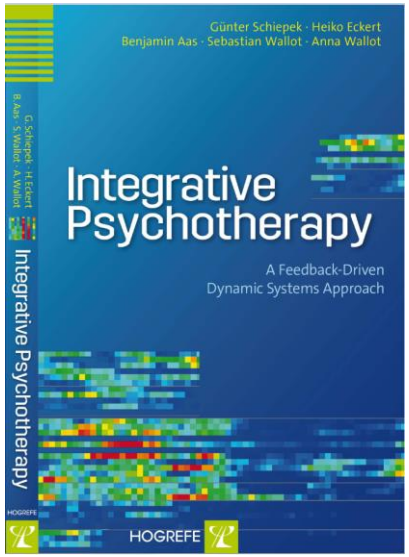
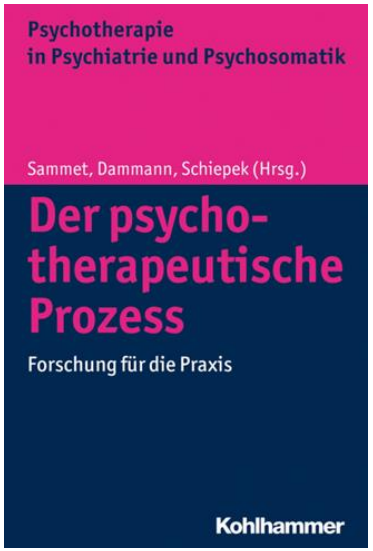
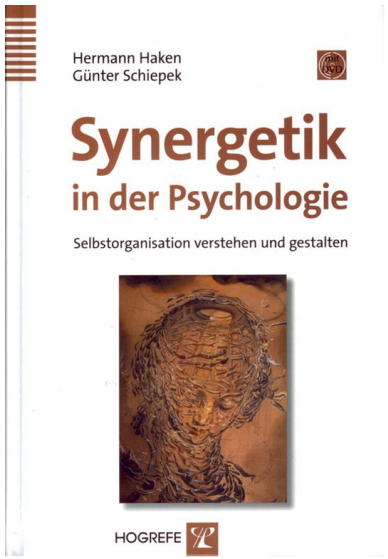
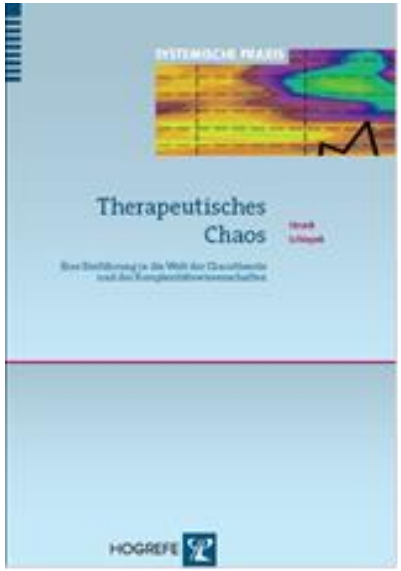
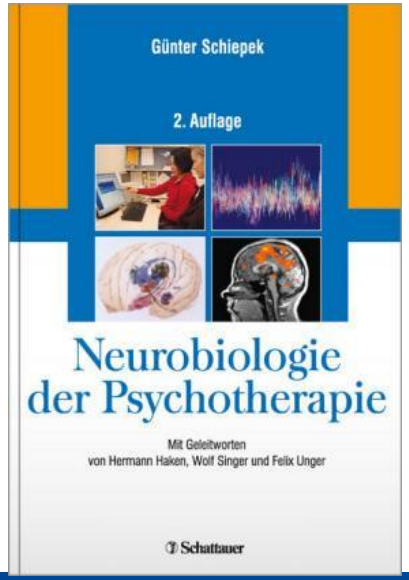
Research Performance: Books











Received: 21 March 2019 | Revised: 28 May 2019 | Accepted: 28 May 2019
DOI: 10.1002/cpp.2384

Clinical Psychology & Psychotherapy, 2019

RESEARCH ARTICLE

WILEY

The Therapy Process Questionnaire - Factor analysis and psychometric properties of a multidimensional self-rating scale for high-frequency monitoring of psychotherapeutic processes

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TABLE 2 Characteristics of the factors (subscales) of the TPQ

Factor	EV	Var%	VarC%	Cα	Cα(70) (min–max)	IIC	MDP	*n*
Well-being and positive emotions (WPE)	6.81	15.84	15.84	0.944	0.922 (0.881–0.945)	0.711	0.816	7
Relationship with fellow patients (RFP)	6.13	14.27	30.11	–	–	0.552	0.552	2
Therapeutic alliance and clinical setting (TAS)	4.81	11.19	41.30	0.944	0.919 (0.855–0.946)	0.740	0.832	6
Emotional and problem intensity (EPI)	4.75	11.05	52.35	0.919	0.904 (0.826–0.935)	0.595	0.717	9
Insight/confidence/therapeutic progress (ICP)	3.47	8.08	60.43	0.943	0.931 (0.854–0.953)	0.625	0.766	10
Motivation for change (MOT)	2.47	5.75	66.17	0.928	0.891 (0.821–0.921)	0.721	0.812	5
Mindfulness/self-care (MSC)	1.08	2.51	68.68	0.924	0.866 (0.789–0.891)	0.753	0.824	4

Abbreviations: Cα, Cronbach's α based on the complete set of multiple time series of all items over 10.442 measurement points; Cα(70), mean of all values of Cronbach's α calculated for the measurement points 1 to 70; EV, eigenvalues of the extracted factors (stop criterion: eigenvalue >1); IIC, mean inter-item correlations of the factors; MDP, mean discriminative power of the items of each factor; (min–max), smallest and largest value of Cronbach's α calculated for the measurement points 1 to 70 (the mean time series length of 70 still includes 85 out of 150 patients); *n*, number of items of each factor; TPQ, Therapy Process Questionnaire; Var%, explained variance of the factors; VarC%, cumulated explained variance of the factors.

TABLE 7 Correlations between the factors of the TPQ and the subscales of the ISR

	Subscales						
Factors	Dep	Anx	OCD	Som	Eat	Add	Total
WPE	−0.61**	−0.39**	−0.16	−0.17	−0.24*	−0.55**	−0.51**
RFP	−0.06	−0.08	0.03	0.00	0.01	−0.10	−0.02
TAS	−0.28**	−0.06	−0.06	0.09	0.04	−0.25*	−0.10
EPI	0.53**	0.37**	0.32**	0.14	0.20*	0.49**	0.50**
ICP	−0.49**	−0.19	−0.15	−0.04	−0.09	−0.35**	−0.29**
MOT	−0.42**	−0.21*	0.03	−0.07	0.08	−0.30**	−0.21*
MSC	−0.49**	−0.29**	−0.11	−0.2*	−0.10	−0.41**	−0.38**

Note. Intercorrelations between the arithmetic mean of the factor values at the first seven measurement points (beginning of the treatment) and the subscales of the ICD-10 based Symptom Rating (ISR), taken at the first days of hospital stay. Subscales: Dep (depression), Anx (anxiety disorder), OCD (obsessive–compulsive disorder), Som (somatoform disorder), Eat (eating disorder), Add (additional scale), Total (total score).

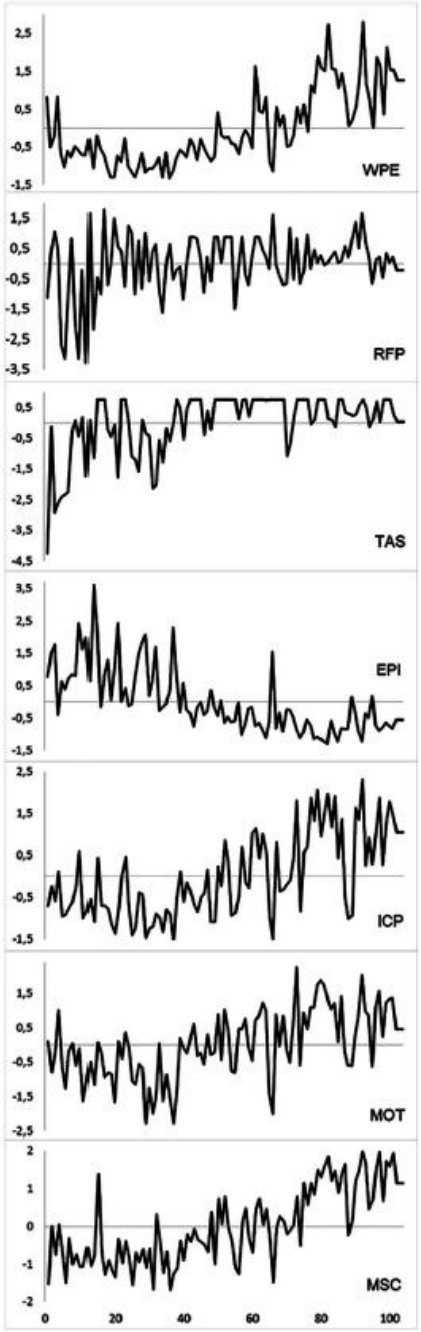


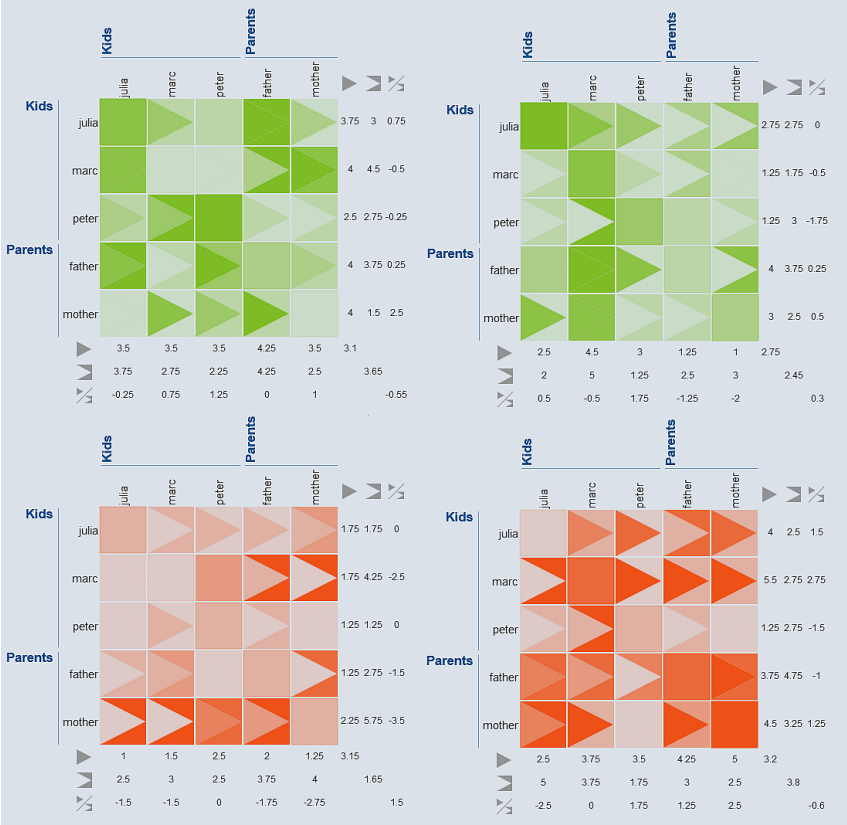
TABLE 6 Factor intercorrelations

	WPE	RFP	TAS	EPI	ICP	MOT	MSC
Well-being and positive emotions (WPE)		0.40	0.21	−0.57	0.66	0.56	0.72
Relationship with fellow patients (RFP)			0.22	−0.44	0.26	0.27	0.30
Therapeutic alliance and clinical setting (TAS)				−0.18	0.31	0.43	0.26
Emotional and problem intensity (EPI)					−0.28	−0.30	−0.44
Insight/confidence/therapeutic progress (ICP)						0.69	0.64
Motivation for change (MOT)							0.56
Mindfulness/self-care (MSC)							

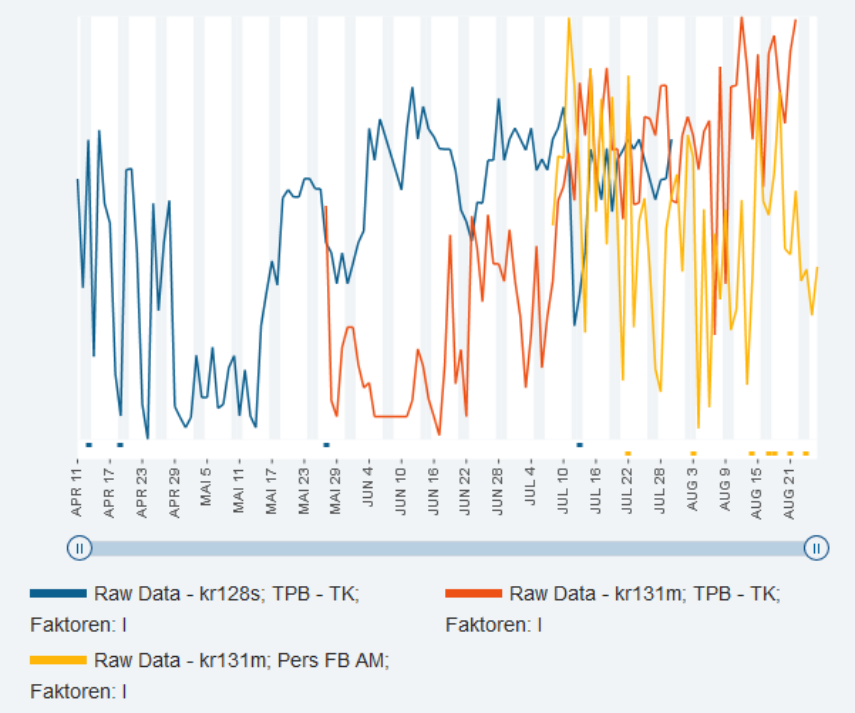
Note. The correlations are based on the *z*-transformed time series of the factors. These time series are produced by including all patients of the sampl which resulted in an artificial time series of 10.442 measurement points. All correlations are significant at $p < .001$. The applied family-wise error correctio for multiple comparisons did not change the significance levels of the correlations.

Synergetic Navigation System (SNS)

Interaction Matrix



Superposition of time series of different persons even if only partially overlapping



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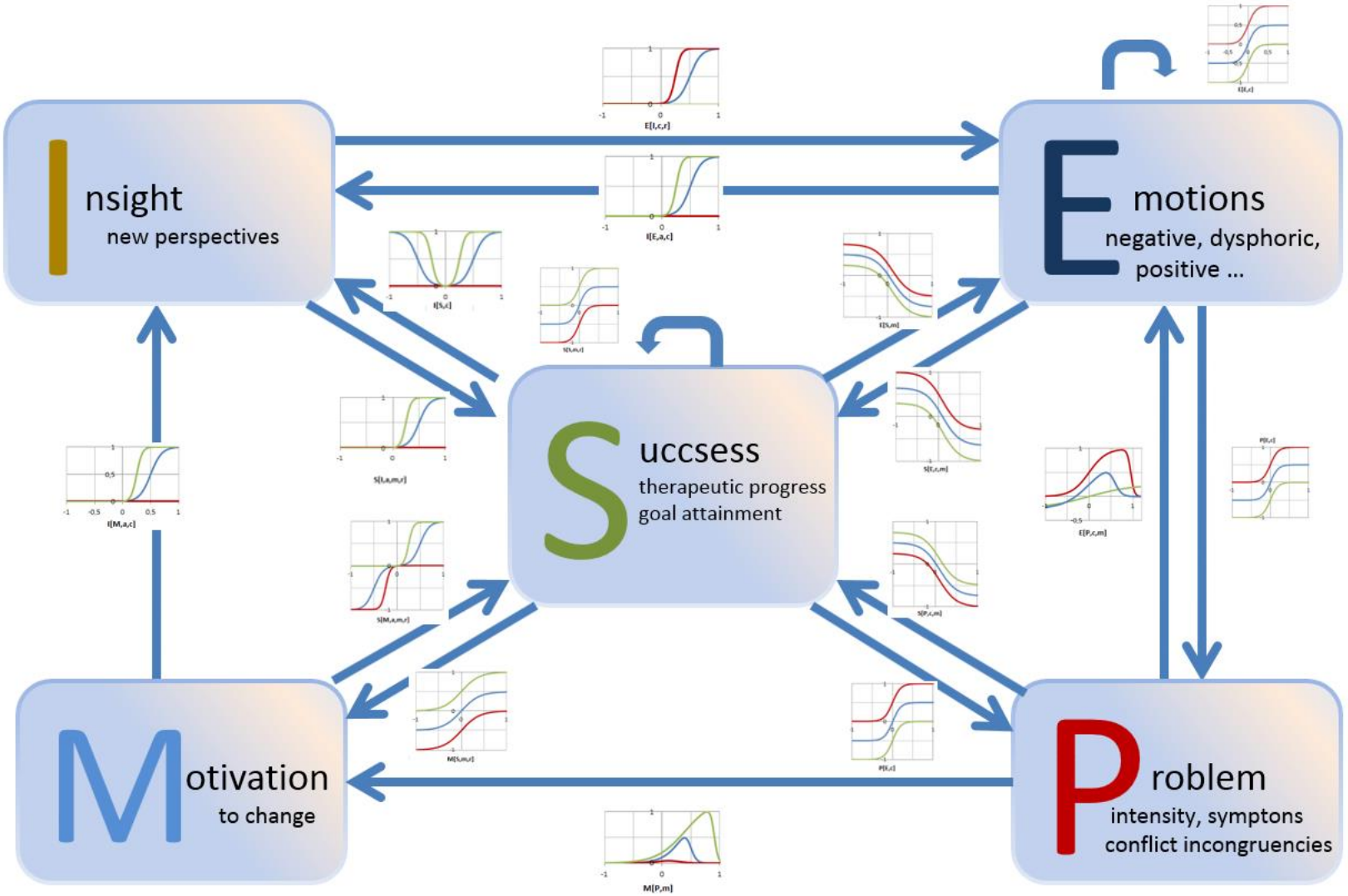
A Nonlinear Mathematical Model of Change Dynamics in Psychotherapy



Dynamic control parameters:
a (therapeutic alliance), c (cognitive competencies: mentalization and emotion regulation),
r (behavioral resources), m (trait motivation)

Control Parameters (traits, dispositions)

a attachment quality + working alliance

- **AAS**, Adult Attachment Scale (german version: Schmitt et al., 2004)
- Therapeutic alliance subscale of the Therapy Process Questionnaire (TPQ-R)

c cognitive competences, mentaization, emotion regulation

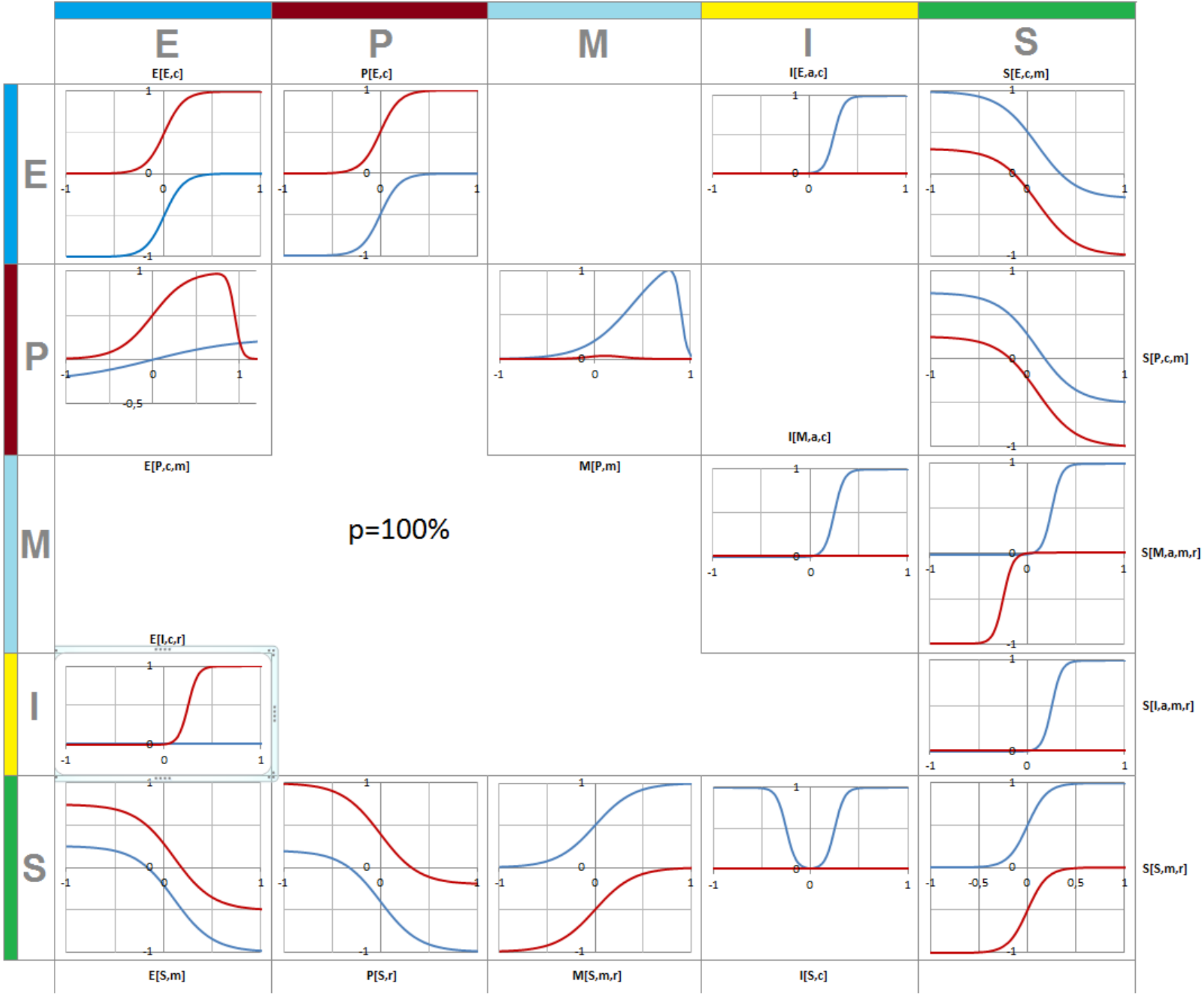
- **HSRI**, Hannover Selbstregulationsinventar (Jäger et al., 2012)
- **EKF-S,** Emotionale- Kompetenz- Fragebogen- SB (Rindermann, 2009)

r resources and skills

- **ERI,** Essener Ressourcen Inventar (Tagay, Düllmann, Senf, 2008)
- **ISK,** Inventar sozialer Kompetenzen (Kanning, U. P., 2009)

m self-efficacy, reward expectation, hopefulness

- **BHS**, Beck Hopelessness Scale, H-Skalen (Beck, 1994)
- **GKE**, Generalisierte Kompetenz Erwartung (Schwarzer, 1994)


E
P
M
I
S
E[E,c]
P[E,c]
I[E,a,c]
S[E,c,m]
S[P,c,m]
E[P,c,m]
M[P,m]
I[M,a,c]
S[M,a,m,r]
p=100%
E[I,c,r]
S[I,a,m,r]
S[S,m,r]
E[S,m]
P[S,r]
M[S,m,r]
I[S,c]

Therapeutisches Chaos

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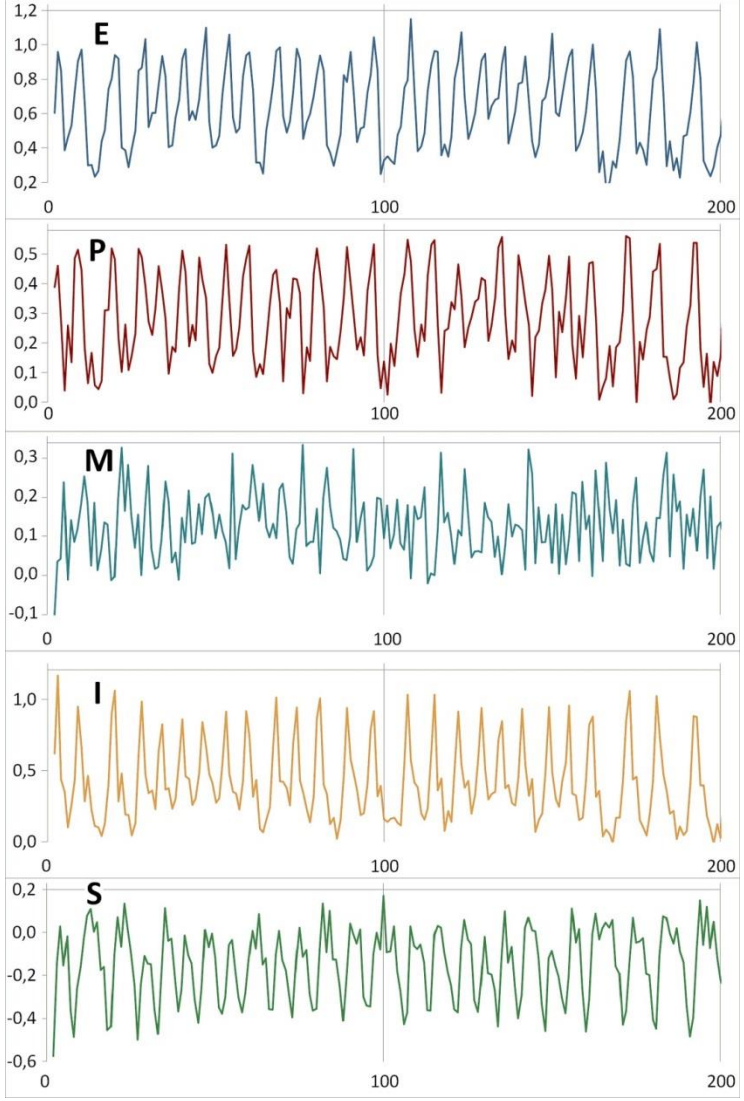
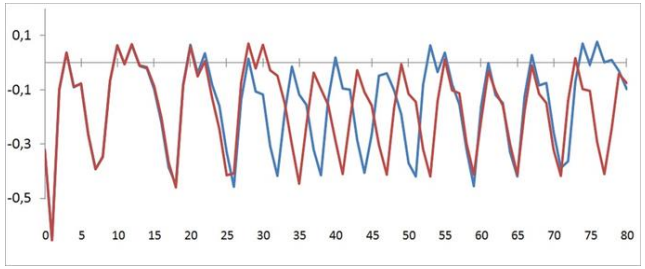
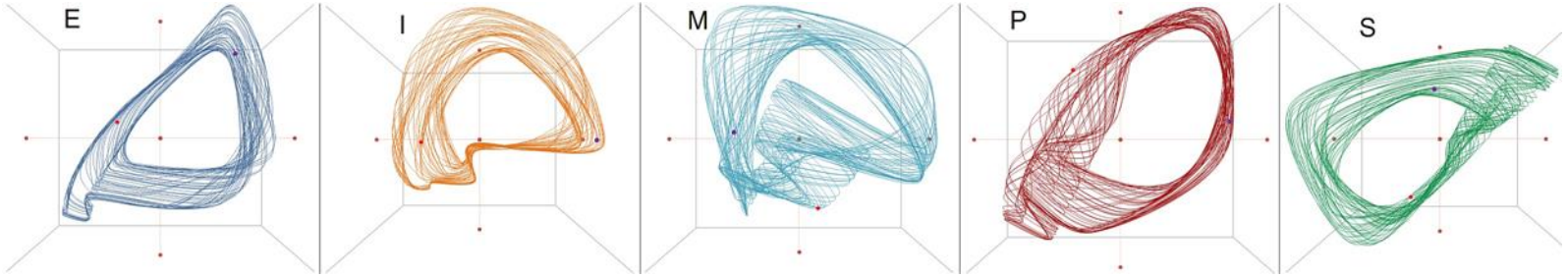
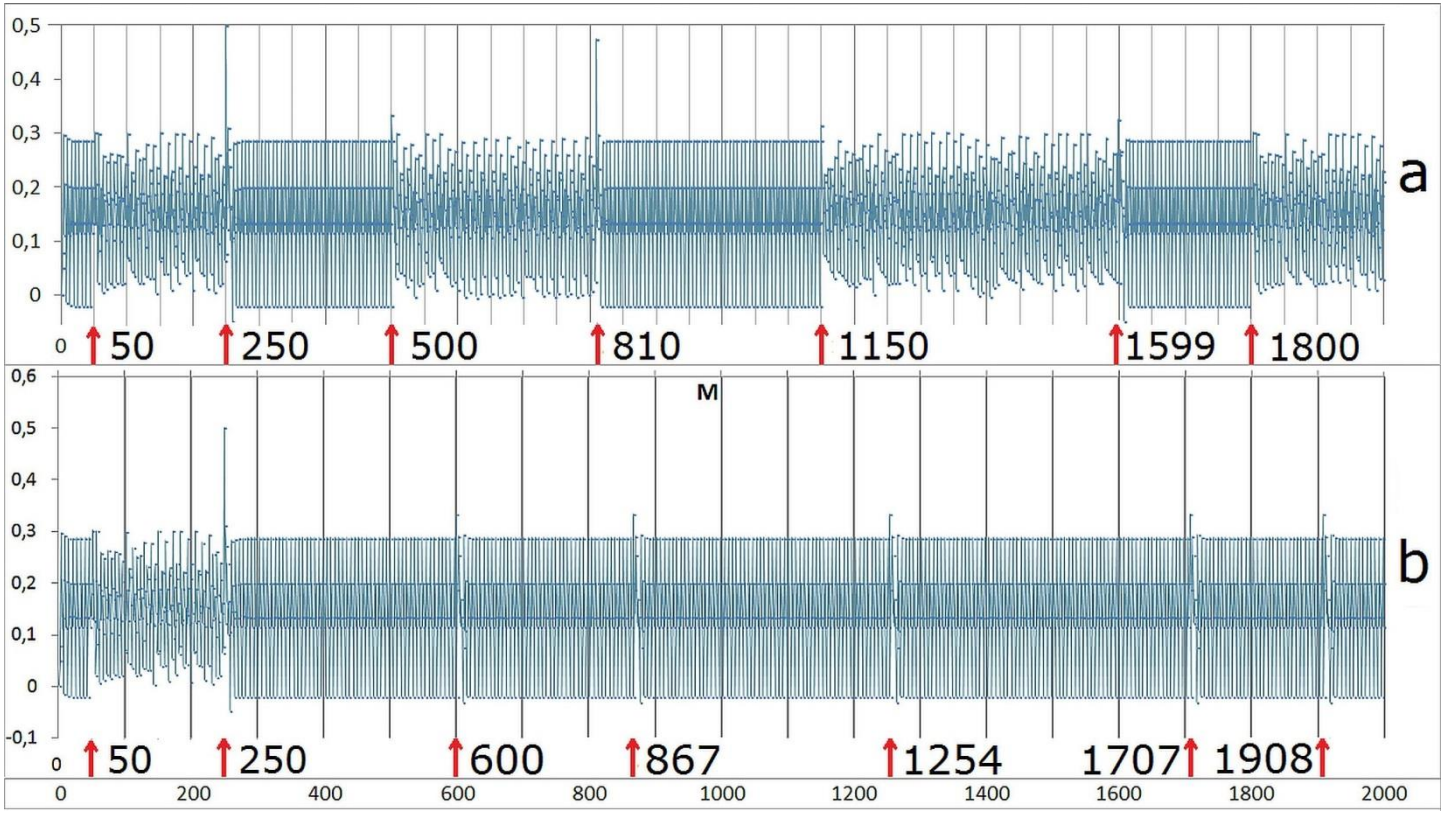
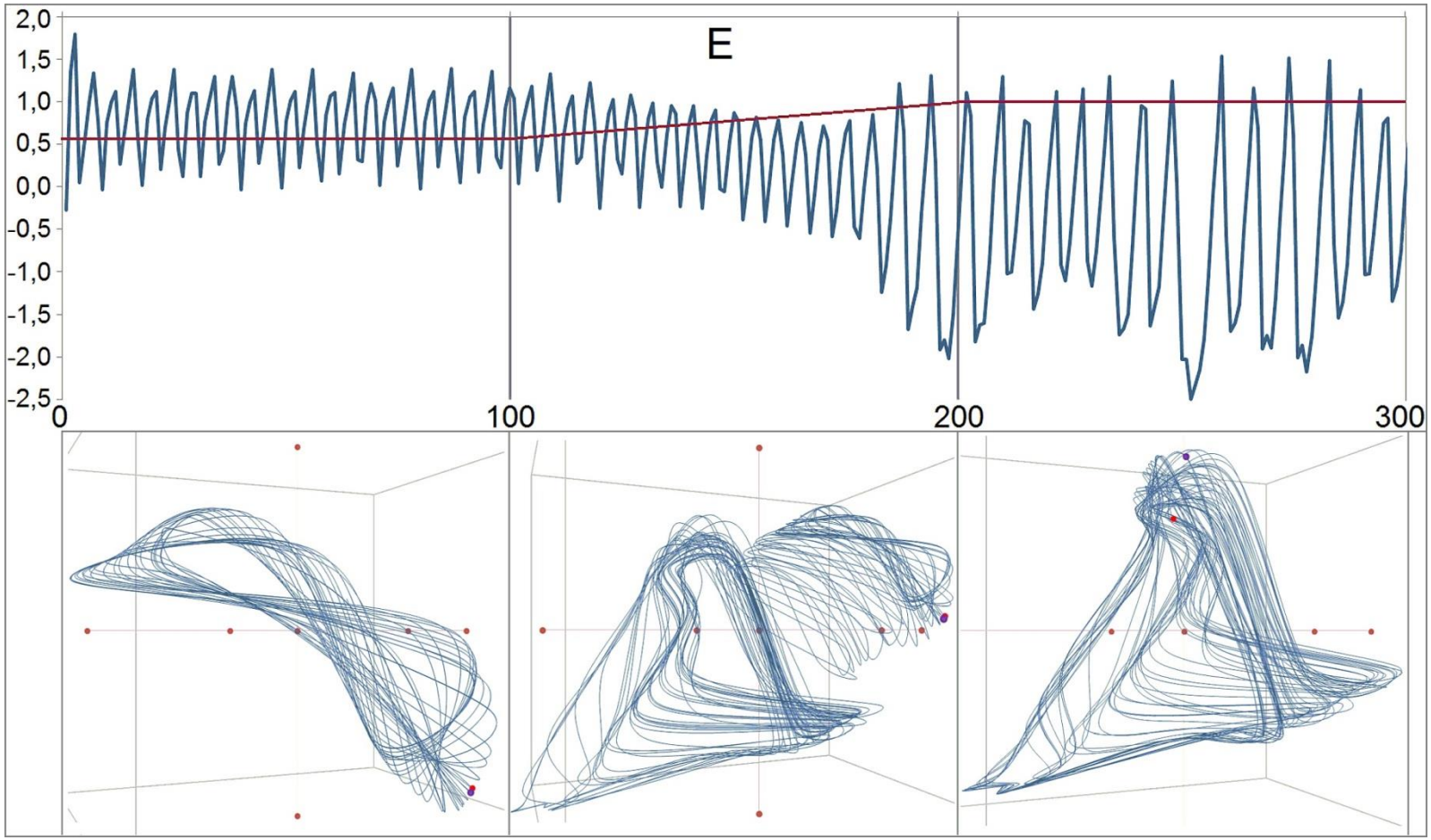






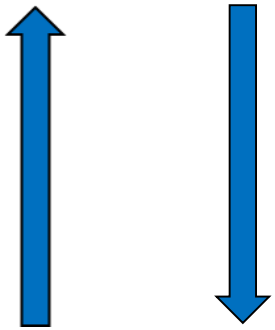
Time-sensitivity of interventions in a computational world




E
2,0
1,5
1,0
0,5
0,0
-0,5
-1,0
-1,5
-2,0
-2,5
0
100
200
300

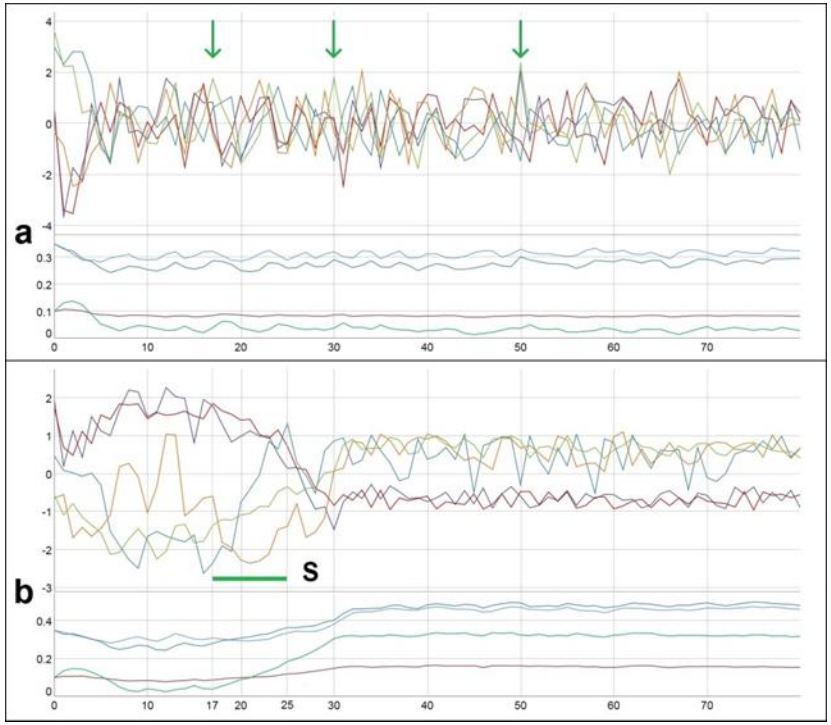
Variables and parameters correspond to states and traits

variables
variable dynamics, attractors
states



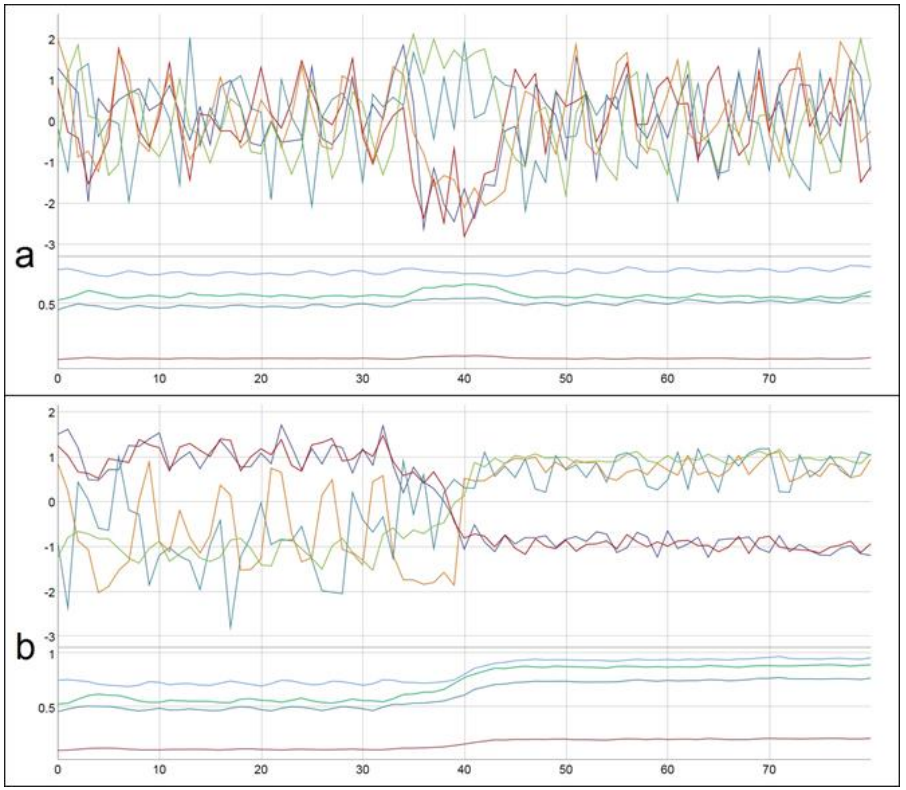
parameters
parameter dynamics
traits

Punctual vs continuous interventions



Noise-dependent dynamics of psychotherapy

Two realizations (random numbers) of the same levels of dynamic noise (a) and (b). Parameters: *a*: red, *m*: green, *c*: bright blue, *r*: dark blue. In both cases, the initial values of variables and parameters are identical: E: 97.6, P: 61.5, M: 7.5, I: 100, S: - 40.7. *a*: 0.10, *c*: 0.75, *r*: 0.46, *m*: 0.53. Dynamic noise 10% on E and P, 5% on M, I, and S, continuously.



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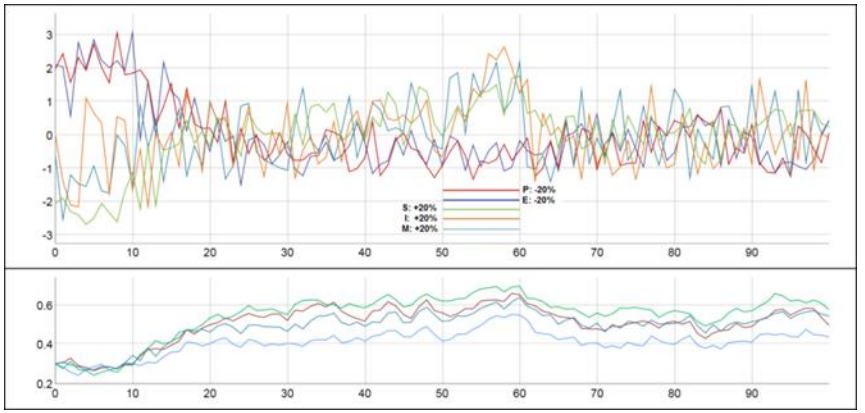
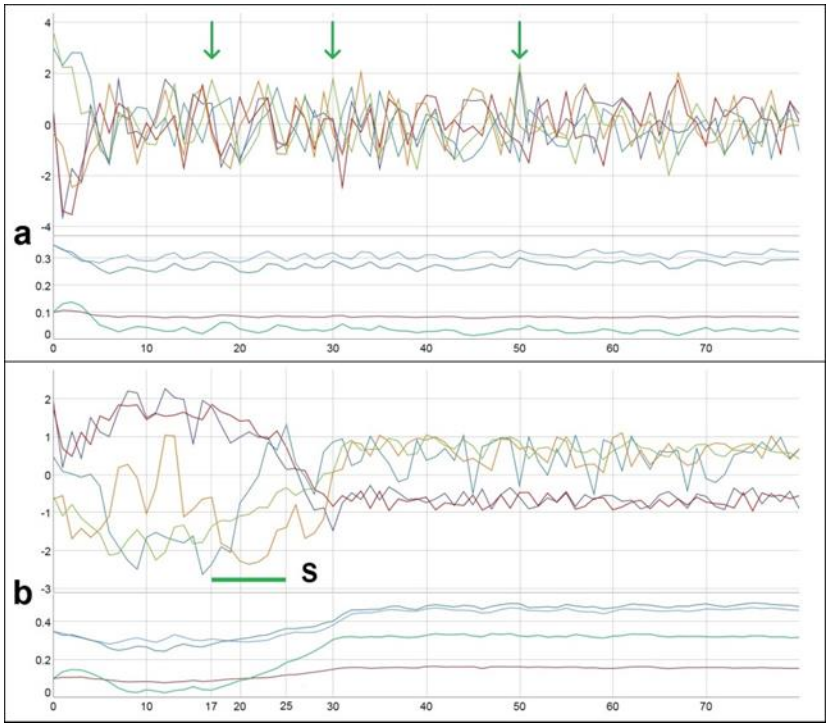
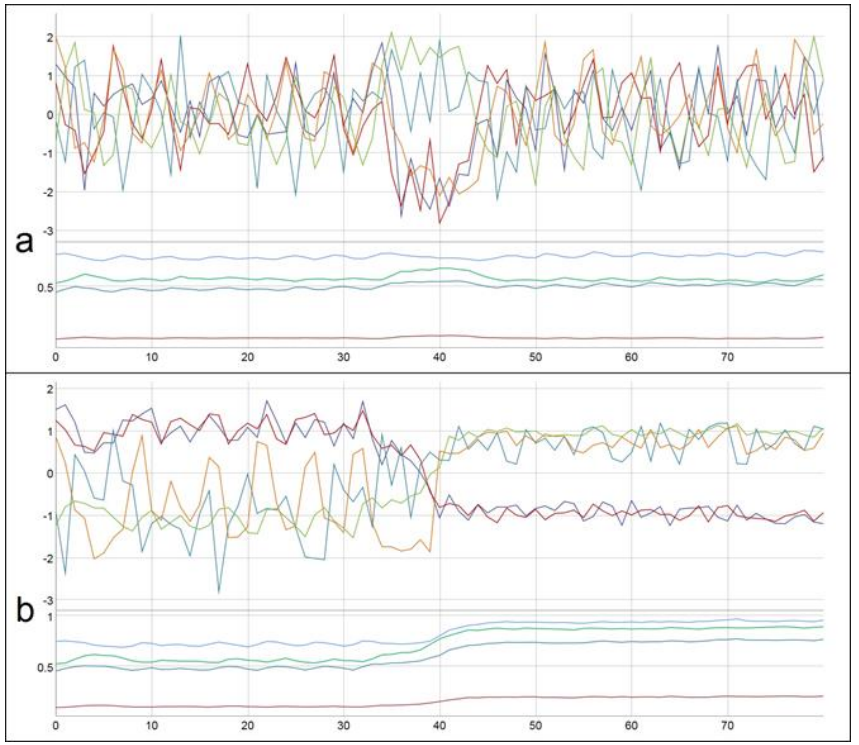
Order and control parameters interact for creating change





Punctual and continuous interventions



Therapeutic effects by „chance"