
# Mapping the Dynamics of Therapeutic Change

## Theoretical Foundations of Schiepek's Dynamic Systems Approach

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# 1. Introduction - Problems and Shortcomings of Current Psychotherapy Research

## 1.1. The One Hundred Year Question of Psychotherapy

Nearly 115 years have elapsed since Freud's seminal lecture at Clark University, which is widely regarded as marking the inception of "psychotherapy as an established medical practice" (Wampold et al., 2018, p. 38). While contemplation of psychological processes predates this event, psychotherapy, as conceptualized in the contemporary Western paradigm, is a relatively recent development (Wampold et al., 2018).

Since then, practitioners and researchers from diverse fields, including psychoanalysis, psychology, behaviorism, and psychiatry, have endeavored to investigate the nature and mechanisms of psychotherapy (Zilcha-Mano, 2021). Despite these efforts, a consensus definition of psychotherapy and a comprehensive understanding of its efficacy mechanisms remain open.

Nevertheless, significant progress has been made. Empirical evidence robustly supports the general efficacy of psychotherapy (Barkham & Lambert, 2021). However, several critical questions persist, including: The delineation between psychotherapy and appropriate placebo interventions (Kazdin, 2007; Kazdin, 2009), explanations for differential treatment responses (Barkham & Lambert, 2021), and specific mechanisms underlying therapeutic change. As Kazdin (2009) aptly notes:

> *After decades of psychotherapy research and thousands of studies, there is no evidence-based explanation of how or why even the most well-studied interventions produce change, that is, the mechanisms through which treatments operate. (p.418)*

We posit that the field of psychotherapy research has reached an impasse within the current paradigm, which primarily relies on pre-post outcome studies and linear models. To advance our understanding of psychotherapeutic mechanisms and subsequently refine interventions, a paradigm shift is suggested.

This thesis proposes the adoption of a synergetic paradigm as a novel foundation for investigating psychotherapeutic processes. Specifically, we will elaborate on the theoretical underpinnings of Schiepek's non-linear model of psychotherapy, which facilitates process-

based assessment, analysis, simulation, and prediction of psychotherapeutic trajectories (Schiepek et al., 2017).

The overarching aim of this work is to establish a generalized, process-oriented framework for evaluating psychotherapy and its underlying mechanisms. This framework aspires to integrate diverse psychotherapeutic schools, bridge research and practice, and reconcile nomothetic and idiographic perspectives.

## 1.2. The Current Outcome-Oriented Paradigm

The current paradigm in psychotherapy research is predominantly based on a linear, outcome-oriented approach that is relying on the medical model and randomized controlled trial (RCT) methodology. The medical model assumes that specific ingredients targeting specific processes are the main facilitators of change (see Wampold et al., 2001, for a detailed explanation of the medical model). This paradigm, while valuable in many respects, has several limitations that have become increasingly apparent in recent years. The RCT-oriented approach in psychotherapy research typically involves randomizing patients and therapists, standardizing treatment manuals and questionnaires, and focusing on mean outcomes across groups (Wampold & Imel, 2015).

This methodology is rooted in a mechanistic worldview that can be traced back to Cartesian mind-body dualism, viewing psychotherapy as a standardized “treatment” that can be objectively studied independent of subjective experiences or individual differences (Wampold, 2001). A further key assumption of this paradigm is that psychotherapy outcomes should be objective and detachable from the personal experiences of patients or the specific dynamics of therapist-patient interactions. The focus is primarily on the treatment itself, analogous to studying a drug’s effects, with less emphasis on how it is delivered or by whom (Wampold et al., 2018). This approach aims to produce generalizable knowledge about treatment efficacy while controlling for confounding variables.

However, unlike drug trials, it is challenging to design credible placebo interventions in psychotherapy research that control for common factors while not providing active treatment (Enck & Zipfel, 2019). Standardizing psychotherapy into manualized protocols can reduce the flexibility and responsiveness that are often crucial in clinical practice (Havik & VandenBos, 1996; Truijens et al., 2019; Wampold & Imel, 2015). The focus on group means can obscure important individual variations in treatment response and process (Bringmann

et al., 2023; Hofmann et al., 2020). Research has shown that subjective processes, such as specific therapist-patient interactions, therapists sensitivity or therapy-external life events of the patients can influence the outcome, yet these are often treated as noise in the RCT paradigm when not being assessed as a specific outcome variable (Wampold & Imel, 2015). Furthermore, the controlled conditions of RCTs may not reflect the complexities and variabilities of real-world clinical practice (Bringmann et al., 2023; Olthof et al., 2020).

These limitations have contributed to several interrelated crises in psychotherapy research and the broader social sciences. There is a proliferation of disconnected micro-theories and results, with little integration into comprehensive frameworks (theory crisis) (Borsboom et al., 2021; Eronen & Bringmann, 2021; Robinaugh et al., 2021). Learning how to construct theories is also a blind spot in psychology and psychotherapy teaching, resulting in many studies and results that are detached from a theoretical framework, which makes an evaluation and development of a "common" direction in research difficult (Borsboom et al., 2021). Questions about the validity and reliability of psychological measures persist as well (measurement crisis). There are ongoing concerns about whether our measures and constructs truly capture the phenomena we aim to study (Eronen & Bringmann, 2021). Findings from controlled studies may not translate well to diverse real-world settings (generalizability crisis; Claesen et al., 2022). Further, many established findings have failed to replicate in subsequent studies (replication crisis) (Claesen et al., 2022; Oberauer & Lewandowsky, 2019).

These crises highlight the need for new approaches that can better capture the complexity and dynamism of psychotherapeutic processes. Instead of only "trying harder" of the same approach, i.e. implementing an even stricter randomization of patients and therapists in even bigger studies, and trying to standardize manuals and therapies even more, a different paradigm is needed (Cramer, 2013). A shift towards more integrative, process-oriented, and individualized research paradigms may help address these shortcomings and advance our understanding of psychotherapy. A theoretical framework could help to integrate the many dis-connected theories and findings in order to facilitate a collective development.

## 1.3. A Short Historical Overview

For the historically inclined reader, the following two chapters delve into the past, examining the evolution of psychotherapy and psychotherapy research. This exploration aims to

elucidate the development of the current paradigm and the present state-of-the research field. By tracing the historical trajectory, we can gain valuable insights into the foundations and challenges that have shaped contemporary approaches to psychotherapy and its scientific investigation.

### *1.3.1. History of Psychotherapy*

Psychotherapy's history can be traced back to two distinct paths: the psychiatric-medical part, which gave rise to psychoanalysis, and the field of psychology, which gave rise to the cognitive-behavioral therapies.

The first path discusses is the psychiatric-medical part, which starts with the distinction between the mind and the body, introduced by René Descartes. This distinction marked a significant shift in the Western weltanschauung and the medical field. Prior to this, the mind and body were considered two aspects of the same entity, and neither was treated as a disturbance to be subtracted. However, the Cartesian dualism led to a separate investigation of the body and mind, with a particular focus on studying the body without considering the mind. This approach proved especially useful in medicine, facilitating new studies, interventions, and explanations. The development of medications targeting specific physical aspects, such as the discovery of bacteria and their treatment with antibiotics, was a novel and successful endeavor during this period (Kriz, 2014).

The success of the mind-body distinction in medical research further promoted the rise of the medical model, which increasingly excluded the mind from consideration. This exclusion was accelerated by the development of randomized controlled trials (RCTs) (Kriz, 2014). However, the medical paradigm encountered limitations when a purely physical (structural) explanation was insufficient, such as in the case of functional physical symptoms like "Railway Spine" phenomenon. These conditions did not respond to physical treatment, and there was no adequate physical (medical) explanation for the symptom (Wampold et al., 2001).

The need for mental explanations, which the medical model had sought to avoid, resurfaced. As the medical model did not offer mental or psychological explanations, non-medical contexts began developing alternative explanations, often with religious undertones, such as the Emmanuel Movement. These alternative approaches also developed successful

treatments, challenging the medical profession's ability to help patients and highlighting the limitations of the medical paradigm (Wampold, 2001; Wampold et al., 2018).

Within the medical and psychiatric world, the field of psychiatry primarily employed physical interventions during this period (e.g. using heat or cold, fasting, etc.) (Brückner, 2023). This was not only due to the prevailing medical model but also because drugs specifically designed for mental disorders were limited around 1850. Although psychotherapy-like techniques, referring to talking-based interventions, had been present in various cultural and temporal contexts (e.g., shamanic practices, religious rituals, philosophical approaches), they were not prevalent in the psychiatric field (Kriz, 2014; Wampold, 2001). These techniques, common knowledge, and ideas were not connected under a single framework or term, and were not aligned with the medical paradigm, until Sigmund Freud gathered and integrated them into a consistent model, which was compatible with the medical paradigm (Kriz, 2014; Wampold, 2001). Freud introduced his structural model of the psyche, comprising the id, ego, and superego (Freud, 1923). This model suggested that these three internal instances are interrelated, and symptoms arise when there is an imbalance between them. Imbalances can occur on two levels: "structural," where basic psychological functions are not developed and cause broader problems, and "neuroses," where the main functions are intact, but specific issues cannot be resolved within the three inner instances, and symptoms represent a way of finding a solution. Freud's model included many other assumptions and explanations (e.g., stages of development, dream interpretations) that were well-received by the medical community. They now had a reasonable "mechanistic" model to explain and treat mental disorders that aligned with their paradigm. Consequently, psychoanalysis experienced a massive rise in the 20th century, which continues to this day.

The second path of psychotherapy history is the one of modern psychology, originating from philosophy, which was initially more philosophical than medical in orientation. However, the pursuit of physiological correlates within the medical model did not exclude psychology (Kriz, 2014). Several attempts were made to gain insight into the mind based on physical occurrences, such as relating intelligence to the shape of the skull in the field of phrenology by Gall (Brückner, 2023). The beginning of modern psychology as a natural science can be attributed to Wilhelm Wundt, who measured reaction times and memory curves (Wampold, 2001). Based on the dogma that theories and measurements had to be based on measurable and visible correlates, behaviorism developed (Wampold et al., 2018). The main paradigm of behaviorism was the "Mind as Black Box," which disregarded

internal mental processes and focused solely on input and output, particularly behavior. Within this branch of research, insights were gained about learning theories (e.g., different forms of conditioning), which were then applied to mental disorders. This offered alternative, more tangible explanations of mental disorders compared to the psychoanalytic field, which primarily relied on "unconscious processes". The first model of mental disorders within the behavioral paradigm was the explanation of anxiety as a learned reaction, initiated by Watson's "Little Albert" experiment, which conditioned an anxious response to a bunny in a young boy (Kriz, 2014).

From this point onward, the contrast between behaviorist and psychoanalytic approaches set the stage for subsequent "waves" of psychotherapy, each emerging as a response to perceived limitations in existing paradigms (Kriz, 2014). In the second wave (1960s), cognitive theorists argued that the behaviorist learning equation was insufficient, as different individuals could show varied reactions to the same inputs. Cognitive models, such as Aaron T. Beck's cognitive model of depression, claimed that the learning equation explaining behavior (output) by input (learning history) was untenable, as different people show different reactions to the same inputs, depending on their cognitions. Additionally, relationship-oriented and humanistic schools, particularly Carl Rogers' client-centered approach, emphasized the "missing" cognitive and relationship-focused components in the behavioral tradition (Kriz, 2014).

The third wave, beginning in the 1980s, saw a reintegration of elements previously excluded from psychological consideration. While behaviorism had removed unobservable mental processes, and cognitive therapies had reintroduced cognitions, this wave brought emotions back into focus. Emotions were reintroduced by emotion-focused theories, especially Leslie Greenberg's emotion-focused therapy and its precursors by Fritz Perls and psychodrama approaches. Furthermore, since the 1970s, different directions focusing on multi-generational aspects and families as systems converged in systemic therapies (Kriz, 2014; Schweitzer-Rothers & Hunger, 2022; Tretter & Löffler-Stastka, 2018).

The originally behavior-focused therapies evolved into cognitive-behavioral therapy (CBT), which became a foundation for integrating various approaches. Since the 1990s, CBT has incorporated emotion-focused techniques, leading to variations such as acceptance and commitment therapy (Hayes et al., 2006) and Schema Therapy (Young et al., 2003). This integration reflects the ongoing evolution of psychotherapy, as it continues to

synthesize insights from various theoretical perspectives and adapt to new understandings of human psychology and behavior.

### *1.3.2. History of Psychotherapy Research*

With the rise of psychoanalysis and behaviorism, psychotherapy also began to develop as a scientific research subject. Although there has always been an interest in understanding how therapy works, the history of psychotherapy research, beginning around the 1940s, can be divided into different phases driven by various main questions (Wampold et al., 2018).

The first phase focused on the validation of psychotherapy in general, following Eysenck's devastating conclusion in the 1950s that psychotherapy is not effective at all (Eysenck, 1952). This movement included controlling for placebo effects and developing adequate control conditions (see Wampold, 2001, for a detailed discussion).

The second phase addressed the question of superiority among therapy schools, known as the "dodo bird verdict". As soon as different schools of psychotherapy were established (i.e., psychoanalysis, behaviorism, cognitive, and humanistic approaches in the 1950s), researchers sought to determine which school was more effective. It quickly became clear that all schools had similar effectiveness, a finding noted by Saul Rosenzweig already in 1936, who coined the term "dodo bird verdict" based on the Alice in Wonderland novel (Wampold, 2001). Back then, Rosenzweig argued that if all therapeutic schools are similarly effective, they might share similar mechanisms. Since then, the idea of common factors has gained importance. In the 1940s Carl Rogers ("necessary and sufficient conditions for change"; Rogers, 1957) and Jerome D. Frank (four factors for an effective therapy; Frank & Frank, 1993) suggested shared mechanisms between different schools, which drive the effect of therapy as well. Up to date, the best researched and most accepted common factors are the dimensions of interaction, especially the matching of therapist and patient and the establishment of a positive relationship, process factors of learning, and process factors of action, as defined by Enck & Zipfel (2019), based on the literature of Lambert & Ogles (2004) and Huibers & Cuijpers (2015). Contributions and results from the common factors movement include the association of therapeutic alliance with outcome, treatments working for approximately 50% of patients, and treatments hypothesized to work on different mechanisms having equal effects (which is not necessarily proof for common factors)

(Zilcha-Mano, 2021). However, the common factors approach did not lead to an increase in effect sizes (Barkham & Lambert, 2021).

The third phase, known as the “litany question”, shifted the focus on comparing schools to comparing disorder-specific interventions, aiming to identify which interventions were superior for specific disorders (Hayes, Hofmann, & Stanton, 2020; Wampold et al., 2018).

The fourth phase, emerging in the 1990s, revisited the idea of common factors. As no therapy school or specific intervention showed particularly high effectiveness, and all had similar effect sizes, researchers pursued the concept that different therapies might share common underlying mechanisms again. This idea connected to the observations made by Rosenzweig in the 1930s and the research on the working mechanisms of therapy conducted by Rogers in the 1940s (Wampold, 2001).

The fifth phase, developing in parallel to the common factors approach and based on the problem of comorbidity, focused on trans-diagnostic processes in the 2000s. Trans-diagnostic processes have an integrative quality, but they also aimed to develop process-specific interventions, such as attention biases, intrusive pictures (trauma) and rumination (Dalgleish et al., 2020; Mansell et al., 2008; Smith & Alloy, 2009). However, the problem of comorbidity raised the question of how to tailor and apply specific interventions for multiple diagnosed patients. This disorder-specific research did not bring an increase in effect sizes either (Schiepek, Kratzer, et al., 2019).

The sixth phase views disorders as complex systems and develops a corresponding analysis system for assessing the complexity of disorders and therapy. Similar to the common factors and trans-diagnostic approaches, the complex systems perspective is not oriented towards a specific process or symptom but integrates both common factors and trans-diagnostic approaches while addressing the problems of comorbidity. It focuses on symptom configuration and the change of symptoms by using principles from complex theory and systems theory paradigms (Constantino et al., 2013; Haken & Schiepek, 2010), moving away from linear pre-post comparisons.

It is important to note that these phases are artificial distinctions and have occurred partly concurrently. The “disorder as complex systems” wave began with system-oriented approaches in the 1970s, which integrated findings from different fields, such as systems theory (Schweitzer-Rothers & Hunger, 2022), and were later continued by Haken & Schiepek (2010). The focus on non-linear symptom configurations gained momentum with the

advent of the network approach in the 2010s (Borsboom & Cramer, 2013). However, despite the foundations of a non-linear approach being established decades ago, a general shift in psychotherapy research away from the linearity and unidimensionality of the medical model has not yet occurred, including changes in theory, research, and statistical models.

## 1.4. Theory Crisis & Micro-Theories

The field of psychotherapy research has seen significant progress in the past decades, with numerous studies providing evidence for the effectiveness of various therapeutic approaches. However, despite these advancements, the current paradigm of linear assumptions, reliance on statistical methods, and focus on results rather than theory development has led to several challenges that hinder further progress in the field, as already mentioned.

One of the primary issues is the lack of interest in theory development. The current paradigm has become a self-limiting dead end, as converging to a new paradigm would require a change in the theoretical framework first. However, the construction of complex theories is not typically taught in psychology (Borsboom et al., 2021), and testing existing theories is often prioritized over developing new ones. Additionally, research designs such as randomized controlled trials (RCTs) are more widely accepted and lead to more deductive hypotheses, emphasizing results rather than theory or model development. If the development of main theories is neither of interest nor taught in psychological studies, the main limiting paradigm with its theories will not be changed (Borsboom & Cramer, 2013; Eronen & Bringmann, 2021; Oberauer & Lewandowsky, 2019). This problem was already warned about by Paul Meehl in the 1960s (Eronen & Bringmann, 2021). It is important to note that theory development is challenging in psychology due to the lack of robust phenomena (Borsboom et al., 2021; Eronen & Bringmann, 2021).

Another issue is the lack of interest in theory integration. Within results-oriented research designs, there is not only a deficit in theory development, but also in theory integration. A theory-oriented approach is necessary to link existing findings to existing theories and to connect different theories to each other. As Devezer & Buzbas (2023, p. 3) states, “In a model-centric paradigm, scientific activity involves iteratively building and refining theoretical, empirical, and statistical models that communicate with each other.” Furthermore, the “publish or perish” culture, with its pressure for publication, facilitates the use of proven

research designs due to a preference for findings with significant results, which impedes theory construction (Fanelli, 2010).

The third problem is the lack of interest in the falsification of existing theories and, at the same time, the disregard for existing concepts. Eronen & Bringmann (2021) refers to this as the generative entrenchment problem: once a theory is positioned in the field of psychology, it is usually not abandoned, even when it has been falsified. Additionally, existing, proven concepts tend to be forgotten in favor of developing allegedly new theories. Wampold et al. (2018, p. 18) calls this phenomenon "history oblivion," as psychotherapy has seen an increasing modularization, resulting in a wealth of supposed new developments, such as specific therapy methods for specific disorders that work with supposedly equally specific change mechanisms and have mostly been given new names, even though essential elements of this treatment concepts have long been described in the history of psychology and psychotherapy. Mischel (2008) calls this tendency of rephrasing existing concepts to publish one's own 'new' construct the 'toothbrush problem', as researchers prefer their own theory rather than using an existing one or amending an existing theory. This violates the basic dogma of science, 'standing on the shoulders of giants'. Oberauer & Lewandowsky (2019) argue that the replication crisis is only a symptom of the theory crisis.

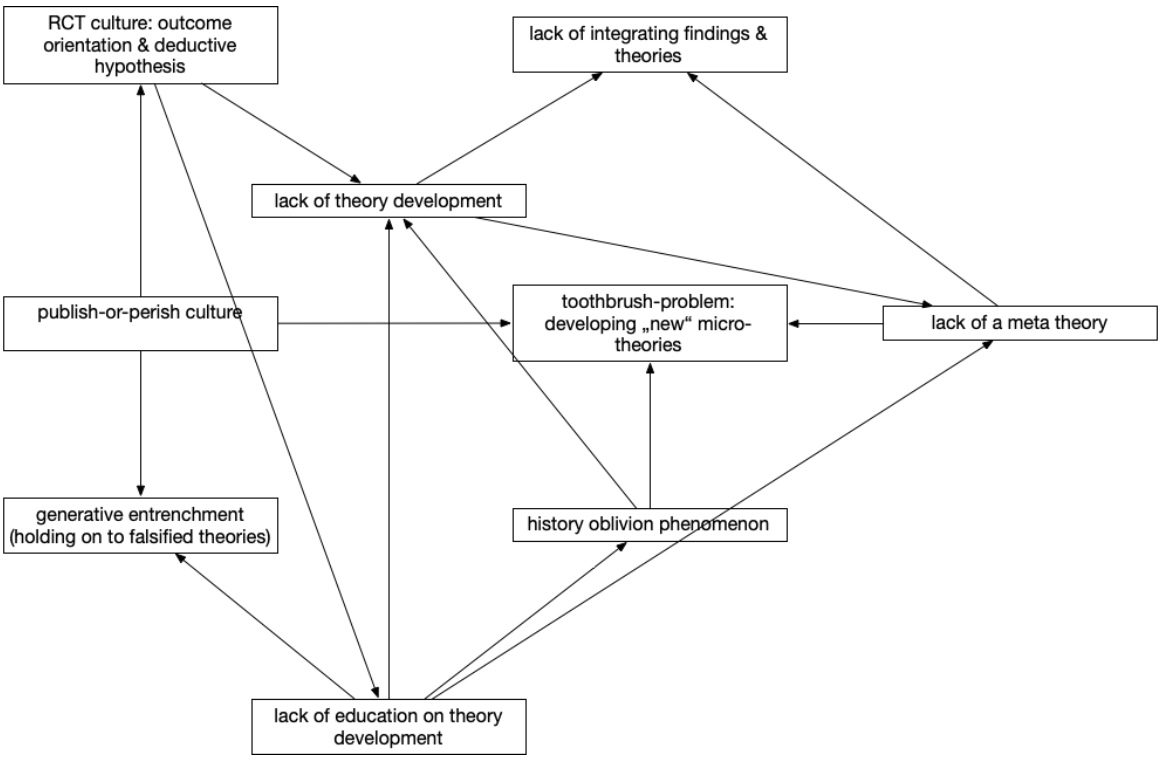



***Figure 1**: Schematic representation of the aspects affecting the theory crisis.*

The previously introduced problems culminate in the fourth issue: the lack of a meta-framework for integrating different results within different theories. This lack of a meta-framework leads to a field of poorly connected micro theories and research fields. Grawe (2000) elaborated on this when introducing his psychological therapy, based on the disconnected fields of fundamental research in psychology (memory and perception), psychotherapy research, and psychotherapeutic practice. **Figure 1** (p. 19) pictures the interaction of the outlined problems leading to the current dead end in theory development.

In conclusion, the current paradigm in psychotherapy research has created a dead end for further development, primarily due to the lack of theory orientation. This has likely led to many other problems, such as the replication crisis, adherence to falsified theories (the generative entrenchment problem), and a lack of integration of results across different research fields associated with psychology, including psychological research, psychotherapy research, and psychotherapeutic practice.

## 1.5. Problems, Questions, and Solutions

After revisiting the history of psychotherapy research and outlining the difficulties of the current paradigm in theory building, further limitations that hinder our understanding of the complex processes involved in psychological treatment and its effectiveness are discussed. One significant issue is the violation of statistical assumptions necessary for generalizing the findings of outcome research. For instance, the homogeneity assumption (Silberschatz, 2015) and ergodicity (Bringmann et al., 2022; Molenaar, 2004) are often not met in samples. Additionally, the field is grappling with the problem of low and static effect sizes (Schiepek et al., 2022), which suggests that the current approaches may not be capturing the full complexity of psychotherapeutic change.

Another challenge lies in the establishment of an increasing number of diagnoses and the lack of a unified approach to addressing comorbidity in both research and practice (Dalgleish et al., 2020). This diagnostic complexity further complicates the understanding of psychotherapy's effectiveness and working mechanisms. The issue of causality, or the 'time-line problem', is also a significant limitation in the current research paradigm. Most findings do not assess the temporal relationship between measurements, such as interventions and symptom change, making it difficult to establish causal relationships. As Kazdin (2009) emphasizes, time-series data is one of the essential requirements for determining

mediators or moderators in psychotherapy research. Despite decades of research, the field still struggles with understanding the working mechanisms of psychotherapy. Response rates remain between 60-70%, similar to the first studies on psychotherapy effectiveness in the 1970s, and these rates rarely include long-term effects (Barkham & Lambert, 2021). Improving psychotherapeutic outcomes requires a better understanding of the underlying working mechanisms (Cuijpers et al., 2019; Garfield, 1990; Huibers & Cuijpers, 2015; Kazdin, 2009; Silberschatz, 2015).

The complexity of psychotherapy poses another significant challenge to the current linear paradigm. Many indications suggest that the development of symptoms and psychotherapy effects is more complex than what can be captured by pre-post designs, which do not allow for non-linear statistical analysis (Hayes & Andrews, 2020). Between-person comparisons make it difficult to include more variables to address the complexity issue, as a lack of sample size leads to a decrease in effect sizes.

Moreover, many phenomena of change occur over time and cannot be assessed with a two-point comparison. Huibers & Cuijpers (2015) argue that there is insufficient evidence to conclusively determine the relative contributions of common and specific factors, particularly in the case of the therapeutic alliance. Existing research lacks adequate studies demonstrating a causal link from the alliance to symptom change, as opposed to the reverse (i.e., symptom improvement leading to a stronger alliance). Eronen & Bringmann (2021) further criticizes ‘fat-handed interventions’, suggesting that effects are probably neither linear nor specific, as an intervention on emotion hardly changes ‘just’ emotions (Cuijpers et al., 2019).

To address the complexity of psychotherapy, there is a need to include more systems and research objectives, focusing not only on the outcome but also on therapist variations and individual change trajectories (Cuijpers et al., 2019; Huibers & Cuijpers, 2015). As Huibers & Cuijpers (2015) suggest, adopting a comprehensive and complex approach to investigating psychotherapy may be more productive than focusing solely on the dichotomy between common and specific factors. One potential study design could involve measuring both common and specific factors, as well as treatment outcomes, at multiple time points throughout therapy. By tracking the temporal sequence of changes in these variables, researchers could gain insights into which factors precede and potentially drive symptom

improvement. However, implementing such a design would require careful planning and sufficiently large sample sizes to yield meaningful results.

The question of how the effectiveness of psychotherapy can be improved has remained unanswered within the current linear research paradigm. To enhance therapy outcomes, a better understanding of the working mechanisms is crucial, as it provides the necessary adjusting screws for optimization. However, the current pre-post designs have reached their limit in terms of investigating these working mechanisms (Huibers & Cuijpers, 2015; Kazdin, 2009). To address these open questions, several suggestions have been put forward.

First, adopting a paradigm that is more open to the individualization of treatments and allows for a better analysis of individual change tracks, rather than solely relying on means, could prove beneficial. As symptom change is highly individual, a mean does not carry sufficient information to determine whether change is due to common or specific factors (Cuijpers et al., 2019).

Second, temporal designs, such as process-oriented research designs, are needed to assess "therapeutic key events," including spontaneous fluctuations, alliance tests, and the resolution of conflicts (Silberschatz, 2015), which are considered drivers of change. These designs would also help address the time-line problem, i.e., the lack of causality in current findings, and allow for the assessment of more complex phenomena. Finally, the need for formal theories must be addressed, as they enable better integration of findings and facilitate the development of improved research designs (Robinaugh et al., 2021). By incorporating these suggestions, researchers can work towards a more comprehensive understanding of psychotherapy's effectiveness and the underlying mechanisms of change, ultimately leading to the development of more effective and individualized treatment approaches.

## 1.6. Complex Perspective for Dynamic Diseases: Complex Systems Paradigm and Time Series

Complexity sciences are a meta-paradigm that crosses over different disciplines, from physics and mathematics to biology and neurosciences (Orsucci, 2006). While there are various definitions of what complexity sciences are exactly (Bringmann et al., 2023), (Orsucci, 2006, p. 390) describes them "as a scientific toolbox, containing some tools to deal, empirically and theoretically, with complex dynamical systems (i.e., many variables systems changing in time)". Complexity sciences can also be seen as an "umbrella term for

several other contemporary system theories, including Synergetics […], chaos theory, complex adaptive systems or network science" (Schiepek & Pincus, 2023, p. 1).

To better understand the concept of systems in psychotherapy research, it's important to define key terms. A **system** can be conceptualized as a set of interconnected elements with defined relationships and, in living systems, a boundary that distinguishes it from its environment. Systems with feedback loops, such as those found in living, conscious, and social contexts, are particularly significant. This definition aligns with the notion of a 'network' or 'structure' with boundaries. **States** refer to the conditions of a system at a given time, such as equilibrium or non-equilibrium. **Processes** describe changes in these states over time, with some processes serving goal-directed functions. The characteristics of these changes, including their speed and intensity, constitute the system's **dynamics**. In this framework, mechanisms are functional structures that govern processes, providing explanations for how systems operate (Tretter & Löffler-Stastka, 2018).

The complex systems paradigm provides a promising new framework for psychotherapy research, addressing many of the limitations inherent in the current linear paradigm. This paradigm allows for the theoretical and mathematical description, analysis, and explanation of dynamic complex systems like psychotherapy and mental disorders, as argued by Schiepek et al. (2022). As Schiepek & Pincus (2023) elaborate, complexity science encompasses several overlapping theories, including Synergetics, chaos theory, complex adaptive systems, and network science (Gelo & Salvatore, 2016; Haken & Schiepek, 2010; Strunk & Schiepek, 2006). These theories provide models and methods for investigating complex and potentially nonlinear causes that unfold over time, enabling a more comprehensive understanding of how psychotherapy works. The complexity perspective stands in contrast to the search for independent causal factors that produce proportional effects on independent outcomes (Schiepek & Pincus, 2023).

One of the key benefits of the complex systems paradigm is its focus on measuring the process through the use and analysis of time series data. This temporal design addresses the Time-Line Problem, allowing for the assessment of causality (Borsboom & Cramer, 2013; Cuijpers et al., 2019; Kazdin, 2009) and better depiction of the relationship between non-therapeutic events and their effects on symptoms. Furthermore, subclinical data of non-patients can be used to assess the development of disorders, and simulations can be conducted using time series data (Borsboom & Cramer, 2013; Schiepek & Pincus, 2023). The

complex systems paradigm also facilitates both intra-individual and inter-individual analysis, bridging the gap between nomothetic and idiographic approaches by focusing on process (Zilcha-Mano, 2021). Additionally, personalized outcome criteria and higher ecological validity can be achieved through daily assessments (Schiepek et al., 2022), which also mitigates the memory bias that interferes with longer-term questionnaires.

The process focus of the complex systems paradigm allows for a better capture of diseases with characteristics that are only visible over time, such as mood swings in bipolar disorder or borderline personality disorders. These disorders, also known as Dynamic Diseases, are not adequately represented by point measurements (Schiepek et al., 2022). Moreover, the complex systems paradigm enables the investigation of complex, nonlinear patterns and relationships between multiple variables, expanding the focus beyond the few outcomes typically studied in RCTs and outcome research to achieve the necessary effect sizes (Schiepek, Felice, et al., 2022). Single outcomes do not fully represent therapeutic change, as change can occur in variables not measured and in the time between measurement points. Time series assessment allows for including more variables, as the number of measuring points provides a larger sample size when focusing on intrapersonal patterns. As Schiepek, Felice, et al. (2022), Schiepek et al. (2017), and Hayes & Andrews (2020) argue, life and therapy are complex, necessitating the consideration of multiple variables to explain effects.

The complex systems paradigm also provides the necessary methodology and theory to assess and analyze complex procedural data and supports the formalization of theories (Robinaugh et al., 2021). This paradigm is well-established in various research fields that explain and predict complex phenomena in physics, weather, and sociocultural areas (Haken & Schiepek, 2010; Thurner et al., 2018). Despite the mathematical vocabulary of the complex systems paradigm, it offers intuitive explanations for mental health (Bringmann et al., 2022), helping patients develop their own narratives and models of their diseases and change journey. Daily measurements also have therapy-enhancing effects (Lambert et al., 2018), supporting patients' self-reflective capacities through the daily habit of assessing their own progress (Schiepek, Felice, et al., 2022) and allowing for better therapist-patient interaction and the uncovering of misunderstandings (Levitt et al., 2016).

In summary, as Kazdin (2009) states, assessing the effects of psychotherapy when understanding it as a production of change requires multiple outcomes, multiple paths, nonlinear

relations, and individual timing. The complex systems paradigm, with its methodology and theory, allows for the assessment of dynamic, nonlinear patterns over time through time series, as well as nonlinear relationships between different variables, which have been shown to occur in symptoms and the process of psychotherapeutic change (Hayes & Andrews, 2020). The focus on daily assessments also brings additional benefits, such as improved therapist-patient interaction through process discussion, enhanced patient reflection on their own process, and the ability to provide a narrative for their own mental health course.

# 2. An Integration - Synergetic Perspective

In the preceding chapters, we introduced the currently predominant linear paradigm in psychology and psychotherapeutic research, providing a brief historical overview of how this paradigm developed over time. We then outlined the various problems associated with the linear paradigm, including theoretical issues such as the 'theory crisis', methodological limitations, and practical challenges. As an alternative, we introduced complex systems theory as a promising new paradigm that offers potential solutions to the unresolved questions within the current outcome-oriented research framework, particularly concerning the time-line problem and the individualization of research.

Given that the model of psychotherapeutic change discussed in this thesis is grounded in the paradigm of complex systems science, the following chapters provide a concise introduction to the most important ideas and definitions of complexity and systems science. Additionally, we outline the systems paradigm within the field of psychology, known as synergetics, along with the definitions of mental disorders and psychotherapy within this paradigm.

It is crucial to ensure that the reader and the author have a shared understanding of psychotherapy, as this is essential for gaining a better grasp of the model itself and the ideas upon which it is based. The same principle applies to mental disorders, as we employ a definition that goes beyond the diagnostic manual and instead utilizes a higher-level meta-definition of mental disorders as a general event or occurrence.

## 2.1. Synergetics as a Solution

Synergetics emphasizes the interaction of the components within complex systems, which gives rise to novel qualities that the individual parts themselves do not possess, a phenomenon known as emergence. This interaction occurs in a specific manner, referred to as self-organization (Haken & Schiepek, 2010). Consequently, synergetics can be understood as a theory of interaction and is aptly defined as a "theory of self-organization in complex systems" (Schöller et al., 2018, p. 1).

### *2.1.1. History of Synergetics*

The theory of synergetics was first enunciated within physics by Hermann Haken in the 1970s, with the aim of formulating different principles of self-organization (Schiepek, Heinzel, et al., 2016). Other related theories in the field of systems science, such as general systems theory, particularly influenced by Ludwig von Bertalanffy, chaos theory, and catastrophe theory, have also contributed to this field (Robinaugh et al., 2020; Tretter & Löffler-Stastka, 2018).

Haken began applying the principles of synergetics to various fields, including biology, neuroscience, the study of the brain, and psychology (Haken & Schiepek, 2010). However, the idea that several parts bring up new characteristics or 'qualities' when interacting together had already been around for a longer time. In psychology, Gestalt psychologists built theories around the importance of the interaction of different phenomena, forming a countermovement to the beginning of the separation of different processes in perception and memory around 1900. They also coined the famous phrase, 'The Whole is more than the Sum of its Parts" (Haken & Schiepek, 2010, p. 297; Wirtz, 2022).

The perspective of complex systems was also applied to mental disorders in clinical psychology and psychiatry, viewing them as the result of complex interaction across different levels, ranging from genetic predispositions to dysfunctional behaviors and societal influences. This approach dates back to the 1930s and evolved further with system theorists such as von Bertalanffy in the 1970s and the application of synergetic ideas in the 1990s by Haken, Schiepek, Tschacher, and Molenaar (Bringmann et al., 2023; Haken & Schiepek, 2010). For a more elaborate discussion on this topic, see Bringmann et al. (2023).

### *2.1.2. Synergetic Principles*

Synergetics, similar to the complex systems paradigm, employs several key terms and concepts that are not commonly found in psychotherapeutic and psychological vocabulary. This section aims to elucidate these concepts.

**Nonlinearity** is a fundamental characteristic of complex systems. In contrast to linear systems, where outputs are proportional to inputs and can be represented by straight lines mathematically, nonlinear systems exhibit disproportionate relationships between inputs and outputs. Mathematically, nonlinearity requires more complex functions, such as higher-

order polynomial or sigmoid growth functions, to accurately represent system behavior (Bringmann et al., 2023). As Goerner aptly puts it,

> *Technically, a nonlinear system is any system in which input is not proportional to output (…) It is everything whose graph is not a straight line – and this is essentially everything (Goerner, 1995, S. 19 quoted in Kornberger, 2017, p. 340).*

Nonlinearity is existent in various systems, including biological, sociological, meteorological, and psychological systems (Kornberger, 2017; Liu et al., 2007; Ostrom, 2009; Schiepek et al., 2017; Thurner et al., 2018). In psychotherapy research, phenomena such as sudden gains and losses (Lutz et al., 2013; Shalom & Aderka, 2020; Stiles et al., 2003), as well as nonlinear relationships between interventions and outcomes (Haken & Schiepek, 2010; Hayes et al., 2007; Schiepek et al., 2017), underscore the nonlinear nature of the therapeutic process. Orsucci goes further, stating that "Almost every system is complex, dynamical, and nonlinear by nature. It is the limit of our approaches or our deliberate choice that makes us see them as linear" (Orsucci, 2006, p. 390). Or, even more broadly, in Stanislaw Ulam's words, one can say that "calling a science 'nonlinear' is like calling zoology 'the study of non-human animals'" (quoted in Orsucci, 2006, p. 390).

**Self-organization** is another crucial characteristic of complex systems and a key concept in synergetics. Haken defines it as:

> *A process by which the interaction between the parts of a complex system gives rise to the spontaneous emergence of patterns, structures or functions. In this interaction the system elements exchange matter, energy and information. (Haken & Portugali, 2016, p. 1)*

While external parameters may facilitate change through self-organization, it is important to note that self-organization is not fully determined or controlled by external parameters or in a single instance (Bringmann et al., 2023).

Closely related to self-organization is the concept of **emergence**. Emergence refers to the formation of new qualities that are visible at a higher level of organization and result from the interaction of many lower-level parts. These emergent qualities are not present in or producible by the individual parts themselves (Haken & Schiepek, 2010, p. 79). In psychology, many phenomena can be classified as emergent. For instance, consciousness itself can be viewed as an emergent quality of the brain, arising from the interplay and interaction of neurons, rather than being a property of individual neurons (Haken & Schiepek, 2010).

**Order parameters** are collective variables that describe the macroscopic behavior or state of a complex system. They emerge from the interactions of many individual components

at a microscopic level and characterize the overall pattern or structure of the system. Order parameters effectively reduce the complexity of a system by capturing its essential dynamics in a few key variables. The term is often used synonymously with "attractor" or "attractor states" (Haken & Schiepek, 2010; Hayes et al., 2015; Kornberger, 2017). Attractor states describe relatively stable patterns of system behavior (Kornberger, 2017) that:

> *Require a significant amount of perturbation to move from these preferred states, whereas those that are less developed or that have been destabilized are changed more easily and allow for adaptation to challenge and changing contexts. (Hayes et al., 2015, p. 3)*

**Control parameters**, on the other hand, are external factors that can influence the state in which the system settles. They can alter the kind and number of attractors (Haken & Schiepek, 2010; Kornberger, 2017). It is important to note that control parameters do not influence the system directly, as this is not possible in self-organizing chaotic systems due to their nonlinear and unpredictable nature. Instead, they offer an indirect possibility of affecting the system's states (Haken & Schiepek, 2010).

The principle of **slaving** describes how order parameters (i.e., attractors), once established, constrain or "enslave" the behavior of the individual components of the system. This means that the collective behavior (described by the order parameters) influences the behavior of the parts (Viol et al., 2020).

**Different time scales** are an important aspect of complex systems (Kornberger, 2017). Individual parts of a system change relatively easily and settle quickly. Attractor states, however, are more resistant to change than individual parts, and tend to return to their original state if the changing force is insufficient. As Hayes notes:

> *The probability of transition from one attractor to another depends on the strength of that attractor, the type of perturbation, the parameters that control system organization (control parameters), and the strength of alternate attractors. (Hayes & Andrews, 2020, p. 2)*

Control parameters are even more resistant to change, shifting more slowly between states and exhibiting a stronger tendency to revert to their original state. In other words, these elements operate on different time scales: attractors change more slowly than individual parts, and control parameters change more slowly than attractors (Haken & Schiepek, 2010).

**Phase transitions** are a crucial concept in synergetics. The dynamics of order parameters are driven by control parameters. When control parameters reach a critical threshold,

known as a "tipping point," a sudden shift in the system's state can occur (Schiepek et al., 2017). As Hayes describes,

> *This type of change, which characterizes much of nature, is often abrupt and discontinuous, with periods of turbulence as attractors destabilize and create the potential for phase or order transitions. During these transitions, systems can reorganize into qualitatively new patterns of functioning, such as from a healthy state to a diseased state. (Hayes & Andrews, 2020, p. 2)*

Finally, **critical instability** refers to a state of a complex system characterized by increased fluctuations and sensitivity to perturbations, often preceding a significant change or transition in the system's behavior. In this state, the system becomes less stable and more susceptible to reorganization (Haken & Schiepek, 2010; Hayes & Andrews, 2020) In the context of psychotherapy and psychological processes, critical instability is often observed preceding major therapeutic breakthroughs or shifts in a client's psychological state (Gelo & Salvatore, 2016). It manifests as increased variability in thoughts, emotions, or behaviors. During these periods, small inputs or interventions may have disproportionately large effects on the system, creating a window of opportunity for therapeutic change as the system becomes more malleable and open to reorganization (Hayes et al., 2007). This state is associated with a loss of resilience in the current psychological configuration, potentially allowing for a transition to a new, more adaptive state (Haken & Schiepek, 2010).

### *2.1.3. Definition of the "Psychological System"*

The aim of the following model is to provide a tool for capturing and assessing the psychotherapeutic process, or more broadly, change processes, within the framework of complex system sciences. To begin, it is essential to define the "Psychological System" as the mental order (or disorder) of humans. According to Haken & Schiepek (2010), the definition of what constitutes the system and what does not depend on the variable of interest. In our case, this variable is the psychological dynamics and mental order (or disorder) of a human being. When selecting a "resolution" for the individual parts of the system, including order and control parameters, there is some flexibility.

When defining the boundaries of the system, we adhere to the principle of functional completeness proposed by Strunk & Schiepek (2006, p. 6). This principle states that all elements functionally involved in the emergence of the phenomenon are considered part of the system. In our case, we focus on the mental functioning of a person as the variable of interest, as our model is client-centered (Lambert et al., 2018; Levitt et al., 2016; Schiepek et al.,

2017). Potential components of the system could include emotions, cognitions, physiological and biological reactions, perception, and behavior (Kornberger, 2017). Depending on the perspective taken, neurons, synapses, and transmitters can also be viewed as parts of the "human mind" system (Haken & Schiepek, 2010). However, in our case, we will adopt a more "zoomed out" perspective, focusing on the level of emotions and cognitions.

In addition to focusing on emotions, cognitions, behavior, and physiological and biological aspects as parts of the system, we employ a state- and trait-like distinction. This means that some variables ("states") will vary on a daily basis and be more situationally influenced, while others ("traits" or parameters) are hypothesized to be more stable and change on a slower time scale (months, years) (Schiepek et al., 2017; Zilcha-Mano, 2021). This distinction allows different system components to move on different time scales and describe specific time-related relationships, which is an important attribute when working with longitudinal data (Borsboom, 2017a; Bringmann et al., 2022; Schiepek et al., 2017).

The state-trait distinction is common in the field of personality research. Personality is characterized by both continuity and change (Roberts & Mroczek, 2008). Research focusing on how personality traits change suggests a time- and level-dependent framework for assessing personality change. This implies that a change in traits occurs via continuous changes in states. States, therefore, represent a different level, and both levels operate on different time scales. This concept will be elaborated further in subsequent chapters (Allemand & Flückiger, 2017; Bleidorn et al., 2020).

#### 2.1.3.1. Definition States

To align with the terminology of the complex systems paradigm, the various components of the system are characterized by different attractors, which we will later refer to as "variables" or "order parameters" in the model. These attractor states can be equated with the commonly used psychological term "states." States are defined as situation-driven or cyclically affected person-in-a-situation measures (Steyer et al., 2015). They fluctuate quite volatile on a daily basis and exhibit high variability. At a psychological level, persistent behaviors, such as habits, or in a clinical context, mental disorders, can be conceptualized as attractor states (Kornberger, 2017).

#### 2.1.3.2. Definition Traits

In contrast to states, the second component of the model comprises traits. Traits are relatively stable measures that do not fluctuate across situations and are considered "an attribute of a person" (rather than an attribute of a person in a situation) (Steyer et al., 2015, p. 72). Traits are used, among other things, to describe personality and individual differences. Personality research has employed the concept of traits since its inception in the 1930s. However, the differentiation between states and traits was not made until the 1960s (Steyer et al., 1999). Unlike states, which fluctuate readily, traits do not change rapidly and are not easily influenced by situational aspects, as they should represent cross-situational stability considered 'characteristic' of a person. Changes in traits, as Steyer et al. (2015) note,

> *Involve modifications to the traits themselves that are long lasting and often irreversible, such as increases in cognitive abilities from early childhood to late adolescence. Trait changes are of particular interest to developmental psychology, educational psychology, and clinical psychology. For example, clinical interventions usually aim at trait changes rather than at mere short-term state changes (Steyer et al., 2015, p. 73).*

To align with the terminology of synergetics, traits operate on a slower time scale than states. We will later refer to traits in the model as "parameters" or "control parameters." In psychological systems, control parameters are not always "outside" of a system as they are in physical experiments (e.g., energy supply from outside of a closed system). Thus, control parameters within psychological systems are traits - and therefore still part of the "human" system. In summary, states and traits are important concepts that help to describe different aspects of personality and behavior. While states refer to temporary emotional or mental conditions that can change over time and in response to different situations, traits refer to enduring patterns of behavior, thought, and emotion that are relatively stable over time and across different situations.

#### 2.1.3.3. Interaction of States and Traits

As previously introduced, our model employs a trait and state distinction, as suggested in the field of personality research. Most frameworks in this field conceptualize a bidirectional relation between states and traits to explain personality change (Roberts & Pomerantz, 2004; Rosenberg, 1998; Wrzus & Roberts, 2017). This proposed "theoretical hierarchy of changeability" (Allemand & Flückiger, 2017, p. 477) utilizes different levels changing at varying time scales. States, including emotions and thoughts, represent the most dynamic and fluctuating level. Traits, conversely, change more slowly and remain stable over time

and across situations. Allemand & Flückiger (2017) elucidate this relationship based on Rosenberg (1998) model:

> *[…] the model posits bidirectional relations among the levels of hierarchy but suggests that the clear organizational influence flows from the more enduring affective traits down to the more transient emotions, indicating a tendency for top-down processes. Hence, a person with a high average level of trait anxiety tends to show more anxious thoughts and feelings in a given situation. However, the opportunity clearly exists for bottom-up influences from momentary emotions to affective traits via moods. Frequent experiences of certain emotions may become more habitual in terms of moods and eventually may impart changes at the trait level (Rosenberg, 1998). (Allemand & Flückiger, 2017, p. 478)*

More recent frameworks, such as the TESSERA (Triggering situations, Expectancy, States/State Expressions, and ReActions) framework by Wrzus & Roberts (2017), are based on similar assumptions:

> *[…] long-term personality development at the level of personality traits occurs due to repeated short-term, situational processes at the level of states/ state expressions (Allemand & Flückiger, 2017, p. 478)*

When examining which 'interventions' can continuously change states to alter personality traits, evidence suggests that life experiences and circumstances, as well as psychotherapy, have the potential to modify personality traits over the long term (Allemand & Flückiger, 2017; Bleidorn et al., 2018; Kivlighan et al., 2015; Roberts et al., 2017).

In summary, a state-trait distinction provides a valid framework for describing personality change, including that induced by psychotherapeutic processes. By acknowledging the bidirectional relationship between traits and states, it explains how consistent alterations in an individual's thoughts, emotions, and behaviors during therapy can gradually influence more enduring personality characteristics. Modifying states through therapeutic interventions might facilitate lasting personality changes, rendering the state-trait distinction a valuable tool for conceptualizing psychotherapeutic change and implementing effective psychotherapeutic strategies.

## 2.2. Mental Disorders in a Synergetic Perspective

The current linear paradigm affects not only research designs, but also the assessment and definition of mental disorders. Within this new paradigm that moves away from linearity and randomized controlled trials, we propose a different definition of mental disorders at a meta-level that characterizes mental disorders by their dynamics, independent of the specific disorder categories. We propose several criteria important for describing and mapping

mental disorders, including a symptom-focused approach, the assessment of symptom dynamics, and a complex systems perspective on disorders.

### *2.2.1. Shortcomings of Current Definition of Mental Disorders*

The medical model, with its symptom-cause assumption, developed in a medical context, entails several difficulties and limitations when applied to mental disorders. These problems encompass problematic reasoning regarding the relationship between symptoms and disorders, disregard for comorbidity and overlapping symptoms, lack of implementing time based assessments although there are time-based definitions. Three main shortcomings of the current paradigm support this new definition.

First, the current dominant "linear paradigm" in psychotherapy and psychology explains mental disorders within the principles of the medical model, hence suggesting a main underlying cause of symptoms (Borsboom & Cramer, 2013; Cuijpers et al., 2019). Mental disorders are further defined by several categorical symptoms, often arranged in a hierarchical and sometimes linear-causal relation. Conversely, when seeking explanations for symptoms, the disorder itself is often referred to as an explanation (Borsboom & Cramer, 2013). This single-cause explanation, adopted from medical diseases where it often provides a valid explanation (e.g., a brain tumor causing headaches and visual disturbances), leads to circular reasoning in the psychological domain. There is no independent measure for the underlying mental disorder beyond the symptoms themselves. Without an external measure for the disorder, the logic of viewing symptoms as proof of an underlying disorder while simultaneously using the disorder to explain the symptoms is untenable (Borsboom & Cramer, 2013). We suggest considering the temporal occurrence and interrelation of symptoms as diagnostically relevant aspects, without focusing on higher-level syndromes or disorders.

Second, there are accumulating problems regarding characteristics of mental disorders and symptoms that cannot be sufficiently explained by the current medical model. The foremost problem is comorbidity (Caspi & Moffitt, 2018; McGrath et al., 2020; Plana-Ripoll et al., 2019). As Caspi & Moffitt (2018) note:

> *Among individuals meeting criteria for one disorder in their lifetime, 66% met criteria for a second; of those meeting criteria for two disorders, 53% met criteria for a third; of those meeting criteria for a third disorder, 41% met criteria for a fourth. (p.832)*

Thus, having a patient with comorbid disorders is more likely than having one with a mono-diagnosis. Hofmann & Hayes (2019) describe the situation:

> *Comorbidity and client heterogeneity was so great within syndromal groups that traditional diagnosis felt more like an empty ritual than a vitally important and progressive process. (p.39)*

This questions the use of single diagnoses, given their rarity. Additionally, a diagnosis itself can "look" very different due to the various possibilities of symptom configurations. A depression may have more in common with an anxiety disorder than with another diagnosed depression in a different patient (Borsboom & Cramer, 2013), further questioning the usage of diagnoses as allegedly consistent symptom conglomerations.

The problem of comorbidity has implications for research as well. Homogeneous groups of subjects with only one diagnosis are not only rare but also of limited use when transferring results to "inhomogeneous" comorbid real-life patients. This could be seen as one of many reasons contributing to the existing implementation gap (Weisz et al., 2015).

Furthermore, comorbidity raises questions about the application of manualized therapies. Besides the lack of effect on outcome of adherence to manuals (Webb et al., 2010), comorbidity complicates the choice of which manual to use. Manuals are usually designed for treating specific disorders defined as diagnoses. With multiple diagnoses, there is often no scientifically reasonable way to decide which manual to use. "Prioritizing" disorders is often an arbitrary decision due to the close relationship and overlap of symptoms. Many therapies orient on the most urgent or dangerous symptoms rather than diagnoses (e.g., the dialectic behavioral therapy hierarchy used in dialectic behavioral therapy for borderline personality disorders, but also depression, posttraumatic stress disorder, and attention deficit hyperactivity disorder) (Sutor, 2022).

Third, mental disorders depend on time. Current diagnostic manuals include temporal criteria in many disorders, not only regarding the minimal time of occurrence of symptoms (e.g., two weeks as temporal criteria for depression) but also changes in symptoms over time (World Health Organization, 2016). Bipolar disorder, with its phases of mania and depression, is a prime example where the temporal aspect is crucial for diagnosis. Despite the temporal aspect in definitions of current disorders, current research paradigms mostly rely on single-time symptom assessments. We suggest a much greater consideration of the temporal development of symptoms in diagnostic and therapeutic aspects.

In summary, as we move towards a model of psychotherapy based on complex systems sciences, we need a definition of mental disorders within the new paradigm that considers the aspects of disorders and symptom development over time in a nonlinear manner.

### *2.2.2. New Definition of Mental Disorders*

Based on the critique of existing definitions of mental disorders, we propose an adaptation. We define mental disorders as hyper-stable or hypo-stable attractor states that cause psychological strain, manifesting in specific symptoms, drawing upon the definition of psychopathology by Olthof et al. (2020):

> *The basis of psychopathology as a dynamic pattern is that its structure emerges over time: it is a process, not a specific configuration of symptoms. Time has always played a central role in conceptualizing psychopathology. No-one would suggest that a momentary state of sadness is pathological, while a dynamic pattern of persistent sad mood often is. In this case, the dynamic pattern is a stable state, called an attractor: the system is pulled or attracted towards that specific behavior. An attractor forms a constraint on the degrees of freedom that are available to a system when generating its behavior; the system cannot 'move freely' but keeps being attracted to one dynamic pattern. For example, an individual keeps being attracted to a sad emotional state (i.e., a fixed-point attractor) or appears to be unable to escape a cycle of periodic shifts between sad and euphoric states (i.e., an oscillator or limit-cycle attractor). (pp.11)*

The key difference between this definition and the current medical (linear) paradigm is that we neither focus on conglomerating symptoms into syndromes nor naming with hypothetical causes of disorders. Instead, our model will focus on working at the level of individual symptoms, their interactions, patterns, and processes that cause and maintain clinical symptoms (Hayes & Andrews, 2020). Such a stability- and flexibility based approach to mental health and disorders has already been present in research years, as well as in various theories (Borsboom & Cramer, 2013; Olthof et al., 2020; Robinaugh et al., 2020).

This new definition offers several benefits that address the limitations of previous approaches. First, it resolves the issue of circular reasoning. In our definition, the symptoms and functional patterns themselves constitute the disorder. In other words, the occurrence and hyper-stabilization of symptoms causing suffering is defined as the disorder itself. This definition does not rely on a mysterious "cause behind" the symptoms. Second, our approach addresses the problem of comorbidity. When the occurrence, duration and interaction of symptoms define the disorder without being aggregated to a higher-level syndrome, the problem of comorbidity becomes obsolete. Additional symptoms are simply viewed as further components of the system, rather than indicating separate disorders. Last, our

definition places a higher emphasis on symptom development over time, rather than relying on one-time occurrences. This focus on change assessment helps to better capture disorder-relevant characteristics, especially with regard to dynamic diseases. By considering the temporal aspect of symptom manifestation and evolution, we can gain a more comprehensive understanding of mental disorders and their progression. The next three chapters focus on the background of the benefits of the new symptom and time focused definition of mental disorders.

#### 2.2.2.1. Part 1: Symptoms are the Disorder - Lessons from the Network Approach

The concept of "symptoms are the disorder" is derived from the network approach, which developed a different perspective on mental disorders in response to issues such as the problem of circular reasoning in current disorder definitions (Borsboom & Cramer, 2013; Bringmann et al., 2022). This approach posits that the reasons behind symptoms remain as multifaceted as humans themselves, although there might be "root causes" for specific symptoms or disorders in some cases, such as trauma. Different circumstances can contribute to the same symptoms, and the same 'causes' can lead to different symptoms or no symptoms at all. For instance, a person with depression might develop symptoms like joylessness and sadness due to a long-term overwhelming workload. Alternatively, someone might develop alcohol abuse with the same background as a coping strategy for stress, lacking other skills. Similarly, someone with a history of physical abuse could develop the same depressive symptoms.

The crucial point here is that symptoms do not have a single cause, and disorders do not consistently show the same symptoms. In some cases, a 'depression' may resemble an anxiety disorder more than another instance of depression (Borsboom, 2017a). Instead of a "check of points for disorders," symptoms are considered "active ingredients" (Borsboom & Cramer, 2013, p. 96) of a pathology and can influence each other.

This perspective reframes comorbidity as more than a simple correlation: symptoms are connected, reinforcing each other, and are parts of a complex system (Borsboom, 2017a; Borsboom & Cramer, 2013; Schiepek et al., 2017). As Borsboom & Cramer (2013) explain:

> *The foundation of the network approach is simple (Cramer et al. 2010, Schmittmann et al. 2013): Instead of interpreting symptoms as a function of a set of underlying/latent disorders, the network approach conceptualizes symptoms as mutually interacting, often reciprocally reinforcing, elements of a complex network. Thus, rather than interpreting symptoms as measurements of a*

> *latent disorder […], symptoms are viewed as part of a causal system (Borsboom, 2008a). […] Instead of passive receptors of the causal influence of a medical condition, symptoms are causally active ingredients of the mental disorders themselves. It should be noted that this move from latent disorders to networks of causally connected symptoms is in itself a quite simple and straightforward matter. In particular, it does not involve the acceptance of any particular theory about psychopathology. It merely results from accepting two simple propositions: (a) Given the current evidence, we should forestall the conclusion that symptoms of the same disorder are uniformly caused by a single psychological or biological condition (or a single constellation of such pathological conditions), and (b) psychopathology symptoms causally influence one another. (p.96)*

With this approach, comorbidity is not problematic anymore. Further symptoms are just included as new nodes into the network, helping to explain the dynamics.

However, current network models face two major problems: a lack of application for clinical practice, as they currently "just" deliver a data-driven map of symptoms (Borsboom & Cramer, 2013; Bringmann et al., 2023), and a lack of a framework for common data collection (Robinaugh et al., 2020). To address these issues, we suggest different 'dimensions of change' as a uniform framework guiding general data collection. These dimensions are allocated to two different time scales (states and traits), as implemented in our model of psychotherapy, discussed later in the main chapter of this thesis. Using a fixed set of variables suited to map changes based on previous research brings several advantages. First, it facilitates application in clinical practice by providing distinct dimensions of change, allowing for structured supervision of clinical cases. This approach should not limit the possibility of using individually generated networks, as done in Ideographic System Modeling (Schiepek, Felice, et al., 2022). Second, a set of change dimensions offers the possibility of common data collection, with the potential to integrate "regular" clinical cases into research studies or designs, as the assessment is based on the same dimensions of change. Our model therefore addresses precisely the problems of the network approach.

#### 2.2.2.2. Part 2: Manifestation over Time - Dynamics as Key Criteria of Mental Disorders

In addition to defining interconnected symptoms as a key characteristic of mental disorders, we suggest a second important characteristic: the dynamics of symptoms. This describes the behavior of symptoms over time, specifically their manifestation (hyper-stability) or overly rapid fluctuation (hypo-stability) (Olthof et al., 2020). Characterizing mental disorders or mental health based on features of the process has been proposed in various theories. One popular concept signifying mental health is psychological flexibility, which, at its core,

describes the ability to adapt to different demands, both internally and externally. Kashdan & Rottenberg (2010) emphasize the temporal aspect of their definition:

> *Psychological flexibility actually refers to a number of dynamic processes that unfold over time. This could be reflected by how a person: (1) adapts to fluctuating situational demands, (2) reconfigures mental resources, (3) shifts perspective, and (4) balances competing desires, needs, and life domains. Thus, rather than focusing on specific content (within a person), definitions of psychological flexibility have to incorporate repeated transactions between people and their environmental contexts. (Kashdan & Rottenberg, 2010, p. 866)*

Pathological processes defined by a lack of psychological flexibility include rumination, patterns of behavioral perseveration, and the inability to rebound after stressful events (Hayes, Hofmann, & Ciarrochi, 2020; Kashdan & Rottenberg, 2010). Network theorist Denny Borsboom has also contributed a definition of mental health that focuses on the characteristic of a "balanced" (i.e., healthy) stability:

> *Mental health is the stable state of a weakly connected symptom network. Mental health is characterized by a resilient symptom network which, if peturbed, quickly returns to its stable state, which is a state in which symptoms are naturally inactive. Note that this definition does not equate mental health to the absence of symptoms. Rather it equates mental health to the attractor state of a complex network, which implies absence of symptoms (apart from random variation) but is not identical to it. (Borsboom, 2017b, p. 85, emphasis in original)*

Related to the stable-state characteristic of mental health is the concept of dynamic diseases. This term describes specific disorders identified particularly by their symptom fluctuation, i.e., hypo-stability of states. An example is borderline personality disorder, where emotional instability is an identifying feature (Schiepek, 2022). Hypo-stable, i.e. dynamic diseases are also characterized by a lack of flexibility. The inability to form stable patterns is itself an indicator of rigidity, hence connecting to the aspect of psychological flexibility (Schiepek, 2022). Another reason to include the dynamics of the symptom process is the existing evidence of dynamic patterns in mental disorders. Examples include early warning signals like sudden gains and sudden losses (Shalom & Aderka, 2020; Wichers et al., 2016), as well as critical slowing (Hayes & Andrews, 2020; van de Leemput et al., 2014). Haslbeck et al. (2021) describe five expected properties of mental disorders regarding their dynamic patterns: feedback loops, asymmetric relationships, different time scales, higher-order interactions, and multiple stable states. These properties are assumed to occur in mental disorders when defining them as a "complex network of interacting symptoms" (Haslbeck et al., 2021, p. 936).

A central part of a model focusing on capturing the aspects of dynamic patterns of mental disorders is the methodology for collecting time-series measurements. With high-frequency repeated measures, the process of change can be mapped (Zilcha-Mano, 2021). Our model will be based on and suited for using and analyzing time series data.

#### 2.2.2.3. Part 3: Mental Disorders as Complex Systems

The previous sections outlined two crucial aspects for a new definition of mental disorders: first, viewing symptoms themselves and their interconnections as the core of disorders, abandoning the search for a single "root cause" explanation; and second, recognizing dynamic patterns of symptom development as characteristic of disorders. Integrating these aspects leads to a definition of mental disorders based on complex systems theory, which allows for assessing both the interconnectedness of symptoms and the features of symptom development processes (Schiepek et al., 2022; Tretter & Löffler-Stastka, 2018).

Several theories have already utilized this approach. Borsboom (2017b) provides a framework for mental disorders with important aspects connecting to the complex system approach. He suggests a working definition of disorders as "emergent phenomena that originate in patterns of symptom-symptom causation" (Borsboom, 2017b, p. 93). The author further emphasizes that no knowledge about the system is needed beyond the level of interest. This essentially applies the principle of functional completeness by Strunk & Schiepek (2006), which states that the defined or needed levels of information depend on the variable of interest. Hence, analyzing and understanding the symptom configuration might be enough for understanding the disorder, and probably even its treatment.

As argued by Hayes, Hofmann, & Ciarrochi (2020), it is not problematic that a model only covers a specific level of interest and disregards other levels of information. Humans are part of a complex ecosystem where there will always be another level of complexity that cannot be addressed:

> *This "groups all the way down" approach suggests that processes at any level of complexity are nested within those at other levels. The psychological level is thus nested with the sociocultural level of group behavior and cultural practices (Wilson & Coan, 2020), but the psychological level in turn contains a genetic/physiological level – genes, epigenes, brain circuits, organ systems, and so on – and the other life forms contained within. Indeed, individual human beings are not just organisms, they are ecosystems. The "individual" human is a massive group of a wide variety of life forms – there are 150 times more genes in a person's gut microbiome than in their own cells (Zhu, Wang, & Li, 2010). These microorganisms in turn have known impact on mental health (Mohammadi,*

> *Jazayeri, Khosravi-Darani, Solati, & Mohammadpour, 2016). (Hayes, Hofmann, & Ciarrochi, 2020, p. 6)*

Due to this enormous complexity, we must choose a level or perspective of interest. This is not problematic as long as the chosen level and model allow for mapping the complexity and do not rely on linear-causal assumptions, which are rarely found in reality.

The definition by Bringmann et al. (2022) of mental disorders aligns with the one by Borsboom (2017b). Mental disorders are defined as complex, dynamic interactions on multiple levels, including behavior, affect states, and cognitions (Bringmann et al., 2023; Bringmann et al., 2022). Cramer et al. (2016) describe depression as a complex dynamic system utilizing the aspects suggested by Bringmann et al.:

> *Complex because symptom-symptom relations might result in outcomes, an episode of MD [major depression] for instance, that are impossible to predict from any individual symptom alone; dynamic because this network of symptom-symptom relations is hypothesized to evolve in an individual over time; and a system because the pathogenesis of MD is hypothesized to involve direct relations between symptoms that are part of the same system. MD specifically is hypothesized to be a bistable system with two attractor states: a 'non-depressed' and a 'depressed' state. (Cramer et al., 2016, p. 2, emphasis in original)*

To assess these characteristics, it is important to capture the process over time, as mentioned earlier (see also Bringmann et al., 2023), which can be done via time series data (e.g., through daily measurements). Only high-frequency time sampling allows for capturing individuality and dynamic patterns (Schiepek, 2022; Zilcha-Mano, 2021).

Integrating the previous models and suggestions leads to the following working definition of mental disorders:

Mental disorders are conceptualized as attractor states with different interacting elements of physiology, behavior, emotions, and cognitions (quality of mind states) (Borsboom & Cramer, 2013; Contreras et al., 2019; Cramer et al., 2016; Fried et al., 2017; Hayes et al., 2015; Hayes & Andrews, 2020; Hofmann et al., 2016; Robinaugh et al., 2020; Schiepek et al., 2017; Schiepek & Pincus, 2023). These attractor states are characterized by hyper-stability or hypo-stability of mental functioning, which cause psychological strain, manifesting in specific symptoms. The attractor states are not fixed points, but rather "a stable, rhythmic, complex, or chaotic attractor, or even a specific type of synchronization between cognition and emotion (Kotsou et al., 2011) or between functional anatomic brain structures" (Schiepek, Felice, et al., 2022, p. 6).

Within the complex system of a disorder, symptoms are self-organized, showing dynamic patterns (Orsucci, 2015). As described by Olthof, Hasselman, Strunk, et al. (2020), these patterns emerge from the interactions between interdependent biopsychosocial processes in a complex adaptive system comprising a person in their environment. The disorder itself can be seen as an emergent phenomenon, causing psychological strain, as a result of symptom interaction at a specific time point and within a specific time frame.

A popular way to visualize these attractor states is the "landscape metaphor" or so-called attractor landscape diagrams. In these diagrams, the rigidity of the system is displayed in deeper valleys. The deeper the valley, the more difficult is change, i.e. metaphorically speaking, more effort is needed for getting out of the valley (Borsboom, 2017b; Cui, Lichtwarck-Aschoff, et al., 2023; Hayes & Andrews, 2020; Schiepek et al., 2017). As Bringmann et al. (2023) explain, the depth of these valleys represents the strength of the attractor, with deeper valleys indicating more stable states that are harder to change. **Figure 2** (p. 42) depicts a diagram of concepts in the landscape metaphor of psychopathology.

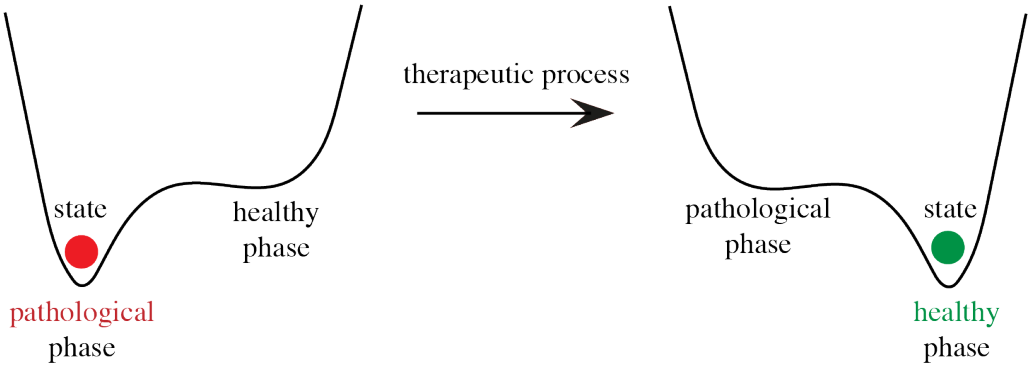



***Figure 2: Diagram of concepts in the landscape metaphor of psychopathology****. The solid line represents attractor landscapes. The ball represents the state of the system. Respectively, the healthy or pathological state is the more stable one in the according landscape (figure is based on figure 1 in Cui et al., 2023, p.744).*

In summary, mental disorders can be defined as non-linear, dysfunctional, and dynamic patterns of day-to-day or moment-to-moment interactions, which manifest in emotional, cognitive, behavioral, and physiological attractor states. The conglomerate of symptoms in a time frame becomes the mental disorder, without a single "one cause behind" explanation. These attractor states can only be adequately described by considering their course over time. As Bringmann et al. (2023) argue, time series data is necessary to assess psychopathology as a process with its dynamic nature. In other words, mental disorders only

manifest through time and hence can only be described with time. This new approach has implications for both research and psychotherapy practice.

## 2.3. Psychotherapy in a Synergetic Perspective

### *2.3.1. Characteristics & Definition of Psychotherapy*

Based on the characteristics of mental disorders and symptom behavior, a process-oriented definition of psychotherapy is proposed, aligning with the dynamic systems framework. This meta-perspective conceptualizes **psychotherapy as a human change process** that unfolds over time, characterized by non-linearity, self-organization, and chaoticity (Hayes & Andrews, 2020; Schiepek et al., 2017). Hayes & Andrews (2020) suggest that the change process occurring in psychotherapy is fundamentally a learning process. This aligns with the definition of psychotherapy as a human change process, as learning is a form of adaptation, and adaptation is a reaction to change (Darwin, 2023; Staddon, 2022). Therefore, psychotherapy can be viewed as a voluntary change process, characterized by learning. Previous psychotherapy definitions have largely lacked a process orientation, while clinical practice is often already process-guided - unless it is manualized . As Schiepek & Pincus (2023) describe the process of adaptation in clinical practice:

> *Most clinicians intuitively, if not explicitly, are continuously assessing and modifying interventions depending upon the degree to which emotion, cognition, behaviour and relational processes are well-integrated, fused (i.e., overreactive to one another) or disconnected. (p.1)*

When describing mental disorders as hypo- or hyper-stable attractor states, psychotherapy aims to facilitate a change of those attractor states, i.e. changing the landscape. Hayes & Andrews (2020) note that psychotherapy:

> *Targets […] the patterns and processes that maintain clinical problems, rather than symptoms or isolated components of a larger system [3]. Tschacher and Haken [44] also highlight the importance of contextual factors, the therapeutic relationship, and environmental and random factors (stochastic variables), which also influence the change process. Therapist interventions (deterministic factors) can stabilize, shift, or destabilize attractors and also increase or decrease exposure to stochastic variables and their influence. (p.3)*

This description suggests that psychotherapy aims to facilitate activating or balancing movement in hypo- or hyper-stable systems to facilitate a change of the pathological attractor. This can be achieved through concrete interventions, framing factors of the psychotherapeutic process such as the therapeutic relationship, and external (non-psychotherapeutic)

factors like life events in the client's life. The attractor change is always connected to the idea of a new stable state that can be sustained by the patient without external stabilizing factors. Being able to sustain a new state independently requires gaining specific skills, qualities, and characteristics, which can be described as a learning process. Psychotherapy provides also a supportive framework facilitating human change, i.e., learning. This has similarities to Vygotsky's concept of scaffolding, which describes the process of supporting a child mastering a new task as little as possible. The support should be only enough that the child is able to succeed by using the maximum of the own skills (Vygotskiĭ & Cole, 1978).

Given the numerous indefinite and individual factors involved in mental disorders and the psychotherapeutic process, it becomes evident that the process cannot be linear and predictable. Instead, it is characterized by complexity, deterministic chaos, nonlinearity, and self-organizing processes (Hayes et al., 2007; Hayes & Andrews, 2020; Schiepek et al., 2017). Findings support that the psychotherapeutic process is not linear but complex (Cramer et al., 2016; Gelo & Salvatore, 2016; Helmich et al., 2020; Nelson et al., 2017; Strunk & Lichtwarck-Aschoff, 2019). For example, there are many nonlinear phenomena underlining the complex characteristic of psychotherapy, such as sudden gains and sudden losses (Cui et al., 2022; Cui et al., 2023), which can only be detected and assessed properly when analyzing the therapeutic process and individual trends rather than comparing pre-post outcomes. A chaotic process implies sensitivity to initial conditions, where slightly different starting conditions result in very different trends, known as the butterfly effect (Strunk & Lichtwarck-Aschoff, 2019). This unpredictability of outcomes, especially regarding long-term symptom behavior, makes a nonlinear process-based definition of psychotherapy indispensable (Schiepek et al., 2017). The chaotic behavior of psychotherapy also serves as evidence for self-organization in the patient's system (Cramer et al., 2016; Hayes et al., 2007; Nelson et al., 2017; Schiepek et al., 2017; Wichers, 2014).

Evidence shows that focusing on the psychotherapeutic process enhances outcomes compared to pre-post focused interventions that do not account for the process, for example, by using feedback systems (Antichi & Giannini, 2023; Lambert, 2013; Låver et al., 2023; Leertouwer et al., 2021; Lloyd et al., 2019).

In conclusion, when considering the characteristics of mental disorders and psychotherapy, a process-based definition of psychotherapy is inevitable. Only process-focused methods

allow for the assessment of aspects like chaos, self-organization, and non-linearity, while offering the possibility of combining individual and group trends.

### *2.3.2. Mechanisms of Psychotherapy Based on Complex Dynamics*

Based on the conceptualization of psychotherapy as a non-linear dynamic process, Hayes & Andrews (2020) propose different pathways through which psychotherapeutic change can occur or be initiated when working with a process-based model of psychotherapy. They delineate four approaches to facilitating change: minor adjustments to existing maladaptive patterns, switching to a healthier attractor, destabilization of the pathological attractor, and stabilization of the healthy attractor.

**Minor adjustments to maladaptive patterns** encompass harm reduction strategies, such as skills training or approaches aimed at raising the activation threshold of the pathological attractor, like mindfulness exercises. Interventions such as reappraisal and emotion regulation strategies are thought to operate through different mechanisms: by reducing feedback loops of pathological attractors and thereby facilitating new learning and reduction of pathological patterns. However, as Hayes & Andrews (2020, p. 5) emphasize, “all of these strategies work within the pathological attractor but do not change it directly”. Compared to the universal mechanisms proposed by Grawe (2000), this is similar to the mechanism of problem coping (also called intention realization).

**Switching** to a healthier attractor necessitates the existence of an alternative attractor. In psychotherapy, this can be facilitated by providing a supportive environment (e.g., through the therapeutic relationship), (re)activating resources, and teaching new skills. While working on developing alternative attractors increases the possibility of switching, it does not directly alter the pathological attractor. This is comparable to the mechanism of resource activation proposed by Grawe (2000).

**Destabilization** of the pathological attractor is a distinct process aimed at interfering with old patterns of functioning to “break the stasis and facilitate transition” (Hayes & Andrews, 2020, p. 5). Interventions for destabilization may include exposure therapy, insight and emotion-focused therapy, as well as cognitive restructuring. Hayes & Andrews (2020) note that during the destabilization phase:

> *Indicators of critical fluctuations (increased variance) are likely to be apparent. This period can be characterized by systemwide disturbance and symptom*

> *exacerbation, but this turbulence can also increase the flexibility needed for attractor change (...). Critical slowing might be apparent, the person does not return as quickly to the pathological patterns after perturbation. (p.5)*

The process of destabilization is like the mechanism of procedural activation, as proposed by Grawe (2000).

The final pathway hypothesized is **stabilizing** new learning. At this stage, a state of bistability is present, where the healthy and pathological attractors are at least equiprobable. The therapeutic focus here should be on strengthening the healthy attractor and activating upward spirals to promote more automatic and easier transitions to the healthier attractor. The mechanism of intention modification has similarities with this process (Grawe, 2000).

It is important to note that even after successful therapy, the pathological attractor does not disappear entirely. It can still be reactivated by random stochastic factors or difficult life events (Hayes & Andrews, 2020). A more detailed explanation of the different phases of change in therapy and the use of various psychotherapeutic techniques can be found in Hayes & Andrews (2020). The mechanisms suggested by Grawe (2000) will be further discussed in the main chapters of this thesis.

In summary, Hayes et al. (2020) propose that different pathways of change are possible in psychotherapy when organizing interventions according to different attractor states. This framework provides a nuanced understanding of how therapeutic change can be initiated and maintained within a non-linear dynamic process model of psychotherapy.

### *2.3.3. Generic Principles and Consequences for Psychotherapy*

Changing the definition of mental disorders necessitates a different model of psychotherapy, as outlined above. This process-based model of psychotherapy subsequently implicates and emphasizes specific attributes of clinical practice.

One key consequence of adopting a more process-oriented approach is constant adjustments based on process observation (Schiepek et al., 2017). This approach requires continuous monitoring of the therapeutic process, often utilizing measurement facilities such as the Synergetic Navigation System (SNS). Beyond mere measurement, process guidance involves analyzing the dynamics of the process, including assessments of stability or instability, before implementing changes based on these analyzes.

The process of frequent monitoring and process-based adaptation has several benefits: it is hypothesized to strengthen the collaboration between therapist and client by potentially supporting the development of a stronger therapeutic relationship (Schiepek et al., 2016; Schiepek et al., 2017). Furthermore, progress monitoring enhances self-awareness, reflection, and communication between therapist and patient (Låver et al., 2023). A recent meta-analysis demonstrated that two-thirds of studies using progress feedback show enhanced outcomes compared to studies without feedback (Lambert et al., 2018). Several researchers have proposed the development of process-based models and their usage in psychotherapy monitoring (Hofmann et al., 2020; Lutz et al., 2022).

A process guided psychotherapy allows to assess unique trajectories of change and a data-based individualization of treatments. While individualizing the psychotherapeutic process is typically already part of clinical practice, it can be seen as a countermovement to the manualization of psychotherapies in the research field (Bakker, 2022). By introducing a model which provides general dimensions of change, which allow and assessment and adaption of the individual process and an inter-individual analysis of the dimension dynamics, this might help to close the gap between research and practice. A recent meta-analysis by Norcross & Wampold (2018) shows that fitting the therapy to the client's needs enhances outcomes, for example by adapting it to their spiritual identity, attachment, or coping style.

In line with the attractor-based hypothesis of how psychotherapy could work, introduced in the last chapter (Hayes & Andrews, 2020), Haken & Schiepek (2010) developed eight 'generic principles' which should frame and guide the therapeutic process to facilitate attractor change. We shortly introduce those principles, as they are an important amendment for the construction of a process-based psychotherapy framework. These principles are: establishing stable conditions, identification of patterns in the target system, connection to purpose, energy and motivation, destabilization and enhancement of fluctuations, Kairos (resonance and synchronization), targeted symmetry disruption, and re-stabilization (Rufer, 2013).

The first principle is the establishment of stable conditions. As Haken & Schiepek (2010) argue, the shift to a new attractor, and the facilitation of this process within psychotherapy, is a destabilizing act. A facilitation of the destabilization can be made by establishing stable boundaries within which the destabilization can take place. In terms of psychotherapy, this can involve predictable and transparent procedures, a good therapeutic relationship, and

self-affirming resources of the patient (resources, experiencing self-efficacy, etc.). From the perspective of attachment theories, one could say that a secure base is necessary for exploration (Bowlby, 1988). The second suggested principle is identification of patterns in the target system. This includes setting boundaries regarding the targeted systems (which part/problem is in focus), as well as a first assessment and analysis of involved processes, especially on a cognitive-emotional-behavioral level. Methods for this procedure could be the ideographic system modeling (Schiepek, 2003), configurational analysis (Horowitz, 1987) (for assessing states of mind), schema- or plan analysis (Caspar, 2018; Schiepek et al., 1997).

Speaking within the picture of the attractors, the second principle could be seen as the "mapping of the attractor". The compilation of a case-conception builds a first sketch of the current conditions, and with that, a starting point for the upcoming process, as well as a base-assessment for later comparison.

The third principle of purpose refers to a matching of therapeutic goals to the patient's life-plan. Goals, timing and rationale of the therapy need to be in line with the patient's concept of life. Otherwise, the goal/change process is not purposeful and aspirational for the patient. According to theories from motivational psychology, only meaningful paths are worth the work (concept of effort justification by J. Cooper & Axsom, 1982). Also, in more philosophical theories, meaningfulness is required for new paths to keep a sense of inner coherence (construct of sense of coherence by Antonovsky, 1987). Within the picture of the attractors, this process could be seen as lightly sketching the new, healthier attractor (to get an idea of where things should move).

The fourth principle of energy and motivation refers to the control parameter of the system in synergetic terms. They have a crucial impact on the system behavior and attractor building. Unlike systems in physics, energy cannot be easily supplied to human systems from external sources. In this case, "energy supply" refers to a modulation of control parameters. The core of this is the (re)activation and intensification of the patients' intrinsic motivation, by activating resources, intensifying existing emotions (Ciompi, 1997) and working on the emotional attribution of motivational goals. A famous tool here is the miracle question by DeShazer (De Shazer & De Shazer, 1998).

The fifth point of destabilization & enhancement of fluctuations corresponds with the switching phase of Hayes & Andrews (2020), where a new attractor is already approachable

for short time. In therapy, this is the time for increased destabilization of the old attractor to facilitate a switching to the new attractor more often. Techniques here can include (among many) role plays, reframing, and behavioral experiments.

The sixth principle is Kairos, resonance, and synchronization. This refers, similar to the second principle "purpose" in regard to content/meaning of goals, to the dynamic matching of interaction and interventions according to the patients' rhythm. This could be on a larger time scale, i.e., when a patient is amid a bigger phase of processing, they cannot absorb new input at the same time. On a shorter time scale, good coordination could involve appropriate body language, intonation, or rate of speaking. Only when the patient's state of mind/process and the input match can therapeutic interventions develop an effect (Ambuhl & Grawe, 1988).

The seventh principle of targeted symmetry disruption is based on the synergetic term of symmetry. A state of symmetry in a system refers to the existence of two or more equally probable different attractors. Only small fluctuations can decide to which attractor the system manifests (in potential landscapes: in which valley the ball rolls). Although the realization is decided by the process, a targeted imagination/activation of the desired attractor can help to increase the probability of switching (similar to assistance when learning new moves in sports). Tools here can be the imagination (realization) of the new attractor within role plays, or motoric tasks (for creating also a somatic representation).

The last principle of re-stabilization corresponds with the phase of "stabilize new learning" by Hayes & Andrews (2020). The aim is to stabilize the new healthier attractor, e.g., with elements of repetition, testing/use in different contexts, integrating new patterns into existing schemata. A more detailed explanation of the principles can be found in Haken & Schiepek (2010).

Collecting data for assessing the psychotherapeutic process requires specific software. There are already some tools existent for monitoring the psychotherapeutic process, e.g. the Trier Treatment Navigator (Schaffrath et al., 2022), ecological momentary assessment methods (Shiffman et al., 2008) or the Outcome Questionnaire (Lambert, 2015). However, to our knowledge, the most potent and flexible tool is the Synergetic Navigation System (SNS) at the moment. It serves as a method for conducting standardized or individualized questionnaires in a chosen frequency. Further, it allows the storage, analysis, and visualization of process and outcome questionnaires (Schiepek, Schöller, et al., 2022). It is an

online application, accessible through browser and app, where questionnaires can either be chosen from the existing databank or self-generated with the implemented editor. The system allows for various visual examinations of single or multiple outcomes, including bar charts and time series, either separated or overlaid within a diagram. Additionally, methods of nonlinear time series analysis are available, enabling the visual display of changes in patterns or critical instability (Schiepek, Schöller, et al., 2022).

## 2.4. Summary: Benefits Nonlinear Paradigm for Assessing Human Change Process

In the preceding sections, we introduced the linear paradigm, which has dominated psychotherapy research with its focus on linear models and outcome-oriented studies. We provided a brief excursus into the evolutionary history of this paradigm and highlighted its associated problems and limitations. As a counterproposal, we presented complexity theory as a new paradigm, incorporating synergetics as a theoretical framework for researching, assessing, and explaining psychotherapy and mental disorders (Gelo & Salvatore, 2016; Orsucci, 2015; Schiepek et al., 2017).

Synergetics provides the methodology for utilizing and analyzing time series, nonlinear patterns, and complexity in disorders and the therapeutic process. It further allows for mathematical formalization, which enables better verifiability than verbal theories and permits the simulation of processes. We argued synergetics is a suitable framework, as it not only offers the possibility of integrating existing knowledge into a meta-theory but also facilitates the integration of different types of information across various time layers, such as biological, psychological, and sociological data (Schiepek et al., 2017). This integration is made possible through the use of time series and because complexity occurs in almost every aspect of research and the world, including biology, stock markets, and social sciences.

Consequently, complexity theory serves as an appropriate meta-theory that enables integration across diverse fields (Bringmann et al., 2023; Thurner et al., 2018). We further introduced new aspects of mental disorders and psychotherapy that can be assessed within the synergetic framework. Key aspects include paying respect to the non-linearity and complexity of symptoms and the therapeutic process. The consequences of psychotherapy and psychotherapy research within the synergetic framework include a more central role in process monitoring and the timing of interventions, leading to an enhancement of individualized treatments (Schiepek & Pincus, 2023). The following chapters introduce a model based on Schiepek's dynamic systems approach, which is grounded in synergetic principles. This model introduces parameters and variables as dimensions of change, allowing for the assessment of patient dynamics and the psychotherapeutic process, in order to monitor and analyze it, and even simulate interventions.

# 3. Theoretical Foundations of Schiepek's Dynamic Systems Approach

In the introduction, we outlined the history and current shortcomings of psychotherapy research and introduced the complex systems paradigm as a framework that holds the potential to overcome the difficulties of the current research and theory landscape. Two central difficulties became clear: first, the lack of integrative theoretical concepts of psychotherapy, which are opposed to an eclectic-integrative practice. Second, the lack of non-linear mathematical approaches to psychotherapy, that do justice to the complex nature of the change processes.

In order to integrate the theoretical and practical landscape of psychotherapeutic interventions, to facilitate a better assessment and deeper understanding of psychotherapy dynamics, in order to gain a deeper insight in *how* therapy works, a model grounded in the principles of the complex systems paradigm is needed. As outlined in chapter Cluster of Different Models: Theoretical and Mathematical Approaches and their Different Foci (p. 57), there is currently no such model to our knowledge that allows for describing and explaining the dynamic patterns of symptom development and psychotherapy processes (Schiepek et al., 2017).

The abstract nature of the complex systems paradigm enables the construction of a psychotherapy model at a meta-level. This higher-level perspective is sufficiently 'distant' to integrate various concepts from different psychotherapeutic schools, accommodating diverse emphases on experiences and interventions related to emotion, cognition, behavior, and relationships with self and others. Such a model can bridge time-sensitive, non-linear measurements and analyzes with pre-post approaches, while also reconciling nomothetic and idiographic perspectives. It can incorporate trans-diagnostic concepts and findings from common factors research, ultimately fostering a stronger connection between psychotherapeutic practice and research (Schiepek & Pincus, 2023).

The integrative nature of this model should extend beyond theoretical constructs to include mathematical formulations. Rather than remaining a purely verbal construct, the model should encompass mathematical equations that precisely capture relationships and are more amenable to empirical testing (Borsboom et al., 2021; Bringmann et al., 2023; Schiepek et

al., 2017). This mathematical foundation enhances the model's rigor and applicability in both research and clinical settings.

In developing this comprehensive model, we adhere to the criteria outlined by Schiepek et al. (2016) and Schiepek & Pincus (2023) for constructing a complex model to assess the psychotherapeutic process. These guidelines ensure the model is not only theoretically sound, but also practically useful in capturing the intricacies of psychotherapy dynamics. By meeting these criteria, the model aims to provide a robust framework for understanding, analyzing, and potentially predicting the complex processes involved in psychotherapeutic change.

## 3.1. Composition of the Model

Our model is constructed as a formal theory, i.e. created by a top-down approach. Based on common factors literature, previous findings and synthesis of current models, we derived a set of variables, parameters and their relations. According to Bringmann et al. (2023) is a formal theory approach characterized:

> *In the formal theory approach, a model is constructed where the nodes [note.: Bringman refers to network models, in this models nodes correspond to variables] and the relationships between them are specified in a mathematically precise way, typically with differential equations that describe how each variable changes over time as a function of the other variables. Thus, in contrast to a data-driven model […], the formal approach starts from theory, from which testable models are then derived. (p.28)*

Schiepek al. (2017) et already developed and published the first version of our model (see also Schiepek et al., 2016; Schöller et al., 2018). It comprises a set of five variables (states) and four parameters (traits). Emotions E (a bi-dimensional variable representing positive and dysphoric emotions), problem intensity P (symptom severity), motivation M (to change and engage in the therapeutic process), insight I (confrontation with avoided behaviors, cognitions, and emotions to gain new perspectives), and success S (experience of therapeutic progress) are the variables. The parameters are therapeutic alliance a (including the therapeutic relationship and the patient's capability to engage in a trustful relationship), cognitive competencies c (including mentalization, emotion regulation, self-reflection and level of structure based), Behavioral resources r (including problem-solving skills) and motivation to change as trait m (including self-efficacy expectations). The model currently encompasses 16 functions that link the five variables. **Figure 3** (p. 54) depicts the variables and their relations with arrows. The mediating parameters are labeled to the arrows. The

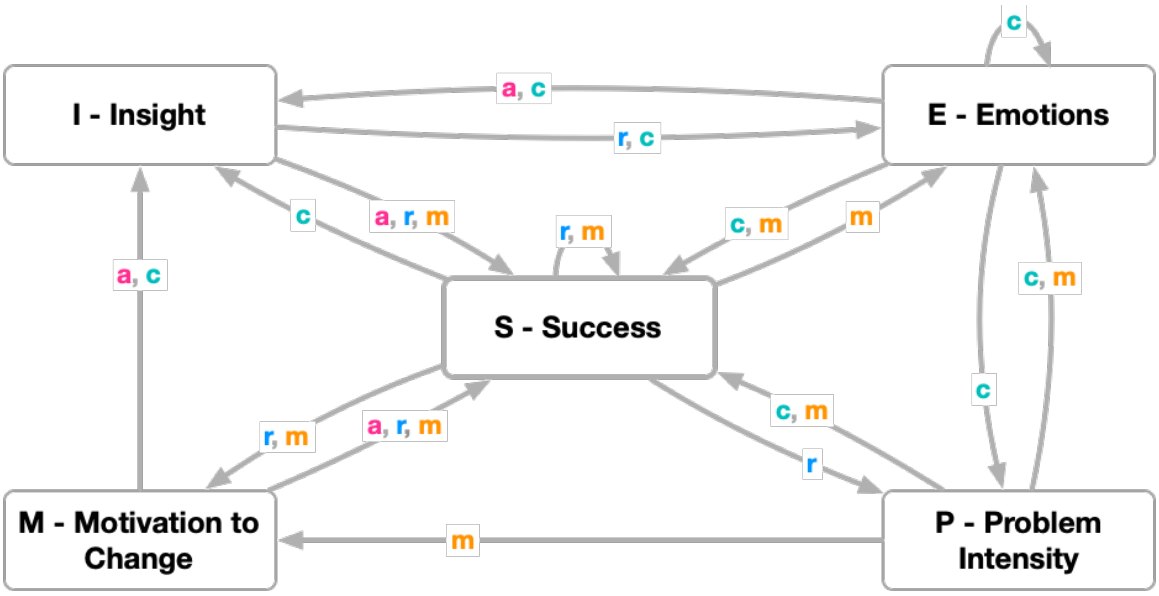



***Figure 3: The 16 functions of the model**. The arrows illustrate the dependencies between the variables. E: emotions, a bi-dimensional variable representing dysphoric or positive emotional experiences; P: problem intensity and symptom severity; M: motivation for change; I: insight; S: success and experienced therapeutic progress. The control parameters modulate the functions. a: therapeutic alliance and capability to enter a trustful cooperation with the therapist; c: cognitive competencies, mentalization and emotion regulation; r: behavioral resources and skills; and m: motivation to change as trait, self-efficacy and reward expectation (figure adapted from Schiepek, 2023, p.5).*

mathematical functions are integrated into five coupled nonlinear equations, each representing a variable. Those equations portray the dependencies of each variable to other variables and parameters, hence depicting their dynamic behavior. Also, the dynamics of the parameters are integrated into a formula for each, depending on the values of the variables. This is based on the assumption of the circular causality of states and traits (i.e. variables and parameters) (Schiepek et al., 2017; Schöller et al., 2018). **Figure 4** (p. 55) depicts a matrix of all 16 functions represented by a corresponding graph.

The decision to use a state/trait distinction in our model is based on important insights from personality development research (Allemand & Flückiger, 2017), synergetics and complexity sciences (Bringmann et al., 2023; Olthof et al., 2020; see also chapter Interaction of States and Traits (p. 32)). This framework provides a valuable approach for modeling the bidirectional relationship between states and traits. Derived from that, a core assumption of our model is that continuously changing experiences and states (cognition, emotion, behavior) over an extended period can alter traits (dispositions and competencies of a person). In terms of synergetics, that means that one the one hand states can change traits. The states (which we refer to as variables) correspond to order parameters, while the traits (which we

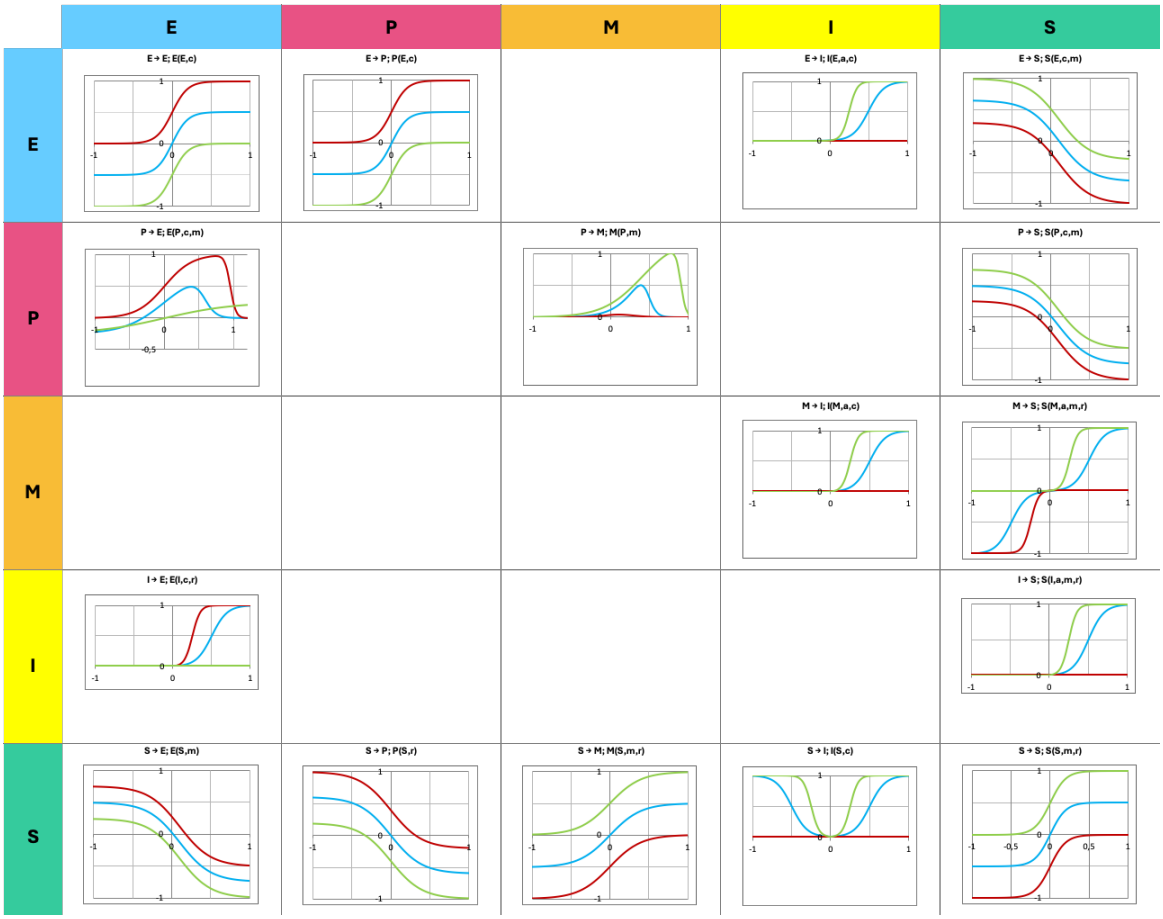



***Figure 4**: Matrix of all functions with the corresponding graphs included in the model. The variables on the left side of the matrix (lines) depict the input, and the variables at the top represent the output. Each function is represented by a graph in a coordinate system with the input on the x-axis and the output on the y-axis. E.g. the first graph in the left top corner depicts the function E → E with the mediating parameter c, resulting in E (E, c). I.e. variable E is impacted by variable E itself and parameter c. Red function graphs correspond to the minimum of the respective control parameter(s) (=0), and green graphs to the maximum of the parameter(s) (=1). Blue graphs represent an in-between state of the control parameters (0 < parameter value < 1). The figure is adapted from Schiepek & Pincus (2023, p.5).*

call parameters) correspond to control parameters of the system (Haken & Schiepek, 2010; Schiepek et al., 2017). On the hand, the parameters mediate the interactions between the variables - based on their values, they can amplify or diminish the impact of one variable on another, as well as activate or inhibit it. Formally, the parameters alter the functions that define the relationships between the variables.

So, when aiming for long-lasting changes, changes in traits are aimed at. From a synergetics perspective, shifting control parameters can help establish a new 'healthy attractor' – an altered long-lasting change in the dynamic of the states (Olthof et al., 2020; Schöller et al., 2018). For example, if specific basic assumptions underlying agoraphobia have been therapeutically addressed, the day-to-day experience of fear may be permanently changed

across situations. Here, the change in the basic assumption represents a change in the control parameter, which helps elevate the state dynamics to a new healthy attractor characterized by less fear and fewer worrying thoughts.

In selecting the variables and parameters for our model, we aimed to identify 'general dimensions of change' for modeling human change processes. This selection was based on common factors research, established psychological mechanisms, and factor analysis of the Therapy Process Questionnaire. We focused on aspects important for patients themselves, as this is the most relevant perspective for psychotherapeutic interventions (Grawe, 2004b; Orlinsky et al., 2004; Schiepek et al., 2017).

Our model, while primarily focused on the client's psychological processes, also considers various external factors. These include therapeutic interventions, the client's perception of the therapeutic relationship, and everyday stressors. The model recognizes that a client's experiences, both within and outside therapy, can significantly influence the variables included in the model. However, it has to be acknowledged that there are many other complex factors affecting the therapeutic process that our current model does not fully capture. For instance, in inpatient settings, interactions with other patients may play a role, while in outpatient care, a client's social network can have a substantial impact. These elements are challenging to precisely measure and incorporate into our model at present. As we continue to develop this approach, we hope to account for these broader contextual influences. Future iterations of the model may explore how the therapist's own cognitive and emotional processes influence their clinical judgments and actions, recognizing the therapist as an integral part of the therapeutic system (Schiepek et al., 2017).

Taken together, the model tries to integrate variables and parameters that are essential in understanding the dynamics of psychotherapy and human change processes in a trans-theoretical and trans-diagnostic manner. The model allows a time-sensitive and non-linear assessment and analysis of symptom development and psychotherapy process. The next chapter will provide a deeper analysis of the interplay and overlap of the chosen variables and parameters with other key concepts and evidence of psychotherapy and psychology research.

## 3.2. The Process of Generating 'General Dimensions of Change'

Above, we introduced shortly which variables are contained in our model. It is also mentioned that we synthesized the variables and parameters mostly based on existing models and results of common factor research. In the following, different integrative models and frameworks are outlined, to show that an integrative mathematical and theoretical model of psychotherapy process is missing and hence needed, and where our variable and parameter selection is based on.

### *3.2.1. Cluster of Different Models: Theoretical and Mathematical Approaches and their Different Foci*

**Table 1** (p. 62) delivers an overview of models describing therapy related concepts in psychotherapy and psychology. For better orientation, we clustered the concepts into the mainly used approaches (theoretical, mathematical, theoretical and mathematical) and focus of explanation (psychotherapy process, disorder specific, psychological functioning). This cluster is based on the distinction made by Robinaugh et al. (2021), who divide theories based on their target system and their structure:

> *Theories aim to explain phenomena by representing the components of the real world that give rise to the phenomena of interest. We refer to these components of the real world and the relationships among them as the target system (Elliott-Graves, 2014). We refer to the components of the theory and the relationships among those components as the theory's structure. (Robinaugh et al., 2021, p. 727)*

The mainly used approach corresponds to the structure used in the model. The focus of explanation corresponds to the target system of the model.

1. Theoretical Approaches: Under the term theoretical models, we gather verbal theories, describing the theory's framework through natural language. These approaches are constrained by the inherent lack of precision of words and language (Robinaugh et al., 2021; Smaldino, 2017). Hence, theoretical approaches are focused on explaining phenomena using mainly words. Prediction of phenomena is limited because of the imprecision of the verbal approach (Smaldino, 2017).
2. Mathematical Approaches: The category of mathematical theories encompasses models that primarily contain mathematical descriptions of phenomena. Of course, mathematical models usually also contain or are connected to a verbal theory. In

our categorization, we focus on concepts that primarily represent data-driven, deductive models of empirical phenomena. The focus in these models is more on the description of, for example, symptom configurations than on an elaborate creation of a theoretical framework that can be embedded in existing theories, predictions, and practical therapeutic application.

3. Theoretical and Mathematical Approaches: The category of theoretical and mathematical theories aggregates frameworks which provide both a verbal and a mathematical theory, and have links to the existing theory landscape, which also allows a comprehensive explanation, prospective, and therapeutic application of a phenomenon.

The rows in **Table 1** encompass three primary target systems, each with a distinct focus: psychotherapy process models, disorder-specific models and psychological functioning models.

1. Psychotherapy Process Models: These models concentrate on how change occurs during therapy. They aim to explain the mechanisms by which symptoms evolve and improve over the course of the treatment. Such models try to examine the dynamics of therapeutic interventions, client responses, and the interaction between therapist and client. They seek to understand the factors that contribute to successful outcomes and the sequence of events that lead to symptom reduction.
2. Disorder-Specific Models: These models focus on describing and explaining the constitution of specific mental disorders. They integrate various symptoms associated with a particular disorder and explore how these symptoms interact with each other. Such models aim to provide a comprehensive understanding of the disorder's etiology, maintenance factors, and the complex interplay between different symptom clusters. This approach helps in developing targeted interventions for specific disorders.
3. Psychological Functioning Models: Unlike disorder-specific models, these models describe general mechanisms of psychological functioning without necessarily focusing on specific symptom patterns. They aim to explain how cognitive, emotional, and behavioral processes operate in both healthy and dysfunctional states. These models provide a broader framework for understanding human psychology and personality, which can be applied to various contexts, including but not limited

to psychopathology. They often form the basis for trans-diagnostic approaches in therapy, next with process models.

Each of these model types contributes uniquely to our understanding of mental health and therapeutic processes.

| | | **Focus (Target System)** | |
|---|---|---|---|
| | | ***Psychotherapy Process*** (trans-diagnostic, trans-theoretical; "how psychotherapy works") | ***Disorder Specific*** ("how a disorder works") | ***Psychological Functioning*** (descriptive, less process-focused; "how the psyche works") |
| **Approach (Structure)** | ***Theoretical*** | *bigger models*:<br>Common Factors;<br>Grawe (2000): psychological psychotherapy;<br>Orlinsky et al. (1994): generic model;<br>Hofmann & Hayes (2019): process-based therapy with extended evolutionary meta-model (EEMM) | | Research Domain Criteria (RDoC) (RDoC, 2024);<br>trans-diagnostic processes (an excellent overview can be found in Morris & Mansell, 2018);<br>hierarchical taxonomy of psychopathology (HiTop criteria) (Kotov et al., 2017) |
| | | *smaller models*:<br>Wampold & Flückiger (2023): CARE Pathway;<br>Lutz et al. (2021): concentric circles model;<br>Barkham et al. (2015): CORE Dimensions;<br>Epstein & Epstein (2016): dual process personality and psychotherapy theory | | *theories of the psyche:*<br>Freud (1923): structural model of the psyche;<br>Janzarik (1988): structural dynamics;<br>Ciompi (1997): affect logic;<br>Tretter & Löffler-Stastka (2018): integrative clinical systems psychology (framework for psychological functioning);<br>Horowitz (1987): ego states |
| | | *meta analysis:*<br>Antichi & Giannini (2023): meta-analysis for moderators for change;<br>Timulak & Creaner (2010): outcome cluster of person-centered/experiential therapies | | personality models: Big Five (Costa & McCrae, 1992), Big 6 (Thalmayer et al., 2011);<br>Mischel & Shoda (1995): cognitive-affective personality system;<br>Cervone (2005): personality architecture |

| | | **Focus (Target System)** | |
|---|---|---|---|
| **Approaches (Structure)** | | | |
| ***Theoretical*** | *systems theory conceptualizations:*<br>Gelo & Salvatore (2016): dynamic system theory for explaining psychotherapy process;<br>Orsucci (2015): meta-model of human change; Russell & Breunlin (2019): integrative systemic therapy;<br>Constantino et al. (2013): context-responsive integrative framework | | *systems theory conceptualizations*:<br>Olthof et al. (2020): complexity theory of psychopathology |
| | | *network models*:<br>Borsboom & Cramer (2013): network theory as paradigm;<br>Haslbeck et al. (2021): abductive formal theory construction (AFTC) framework for designing theories | |
| | *therapy-school dependent:*<br>Rogers (1957): necessary and sufficient conditions for psychotherapy;<br>psychodynamic explanations: alliance measures, transference, countertransference | *therapy-school dependent*:<br>mostly cognitive-behavioral therapy-based explanations and models: e.g. Becks' depression model (Beck, 1979), panic disorder model (D. M. Clark, 1986), cognitive behavioral analysis system of psychotherapy (CBASP) for chronic depression (McCullough, 2012) | *therapy-school dependent*:<br>Young et al. (2003): modus model of schema therapy;<br>psychodynamic explanations: level of structure and conflicts in the Operationalized Psychodynamic Diagnosis (OPD) (Cierpka et al., 2014); mentalization-based therapy (Bateman & Fonagy, 2010); supportive-expressive therapy (Luborsky, 1984); transference focused therapy (Kernberg et al., 2008) |

| | Focus (Target System) | | |
|---|---|---|---|
| ***Mathematical*** (descriptive/explanative focus) | Lutz et al. (2019): Trier Treatment Navigator;<br>Lambert (2015): Outcome Questionnaire | *older models - simulation of dynamics (overview by Schiepek et al., 2016)*:<br>schizophrenia: Ciompi & Müller (1976), Schaub & Schiepek (1992), Schiepek et al. (1992);<br>family dynamics: Kriz (1992);<br>marriage dynamics: Gottman et al. (2005);<br>emotional valence: Liebovitch et al. (2011);<br>depression: Demic & Cheng (2014) | *neuropsychology*:<br>Sanz Leon et al. (2013): the virtual brain |
| ***Theoretical & Mathematical*** | Schiepek et al. (2017): trans-theoretical and trans-diagnostic process model | Robinaugh et al. (2019): panic disorder | Lichtwarck-Aschoff (2008): dynamic systems theory model of identity development |

***Table 1: Overview of different models****, clustered based on their focus (psychotherapy process, disorder specific, psychological functioning) and their underlying approach (theoretical, mathematical, theoretical & mathematical with a focus on explanation, prospective and therapeutic usage)*

### 3.2.1.1. Theoretical Approaches

There are many different theoretical models and concepts in the field of psychotherapy research (see also THEORY CRISIS & MICRO-THEORIES (P. 18)).

Theories with a focus on the psychotherapeutic process range from a few larger, more established and comprehensive models, too many smaller integrative models and meta-

analyzes of effective factors, to models based on system theories and models that can be assigned to schools of therapy. Several broad frameworks are Grawe's concept of general psychotherapy (called psychological therapy) (Grawe, 2004b), the generic model of psychotherapy (Orlinsky, 2009), further emerged from the field of common factors research (e.g. the contextual model of psychotherapy by Wampold & Imel, 2015), and the process-based therapy with the extended evolutionary meta model by Hofmann & Hayes (2019).

Grawe's psychological psychotherapy encompasses a sophisticated framework explaining human functioning and therapy processes from a complex interaction of cognition, motivation and learning factors (Castonguay et al., 2015). Grawe also contributed to the generic model of psychotherapy by Orlinsky (2009), which is a trans-theoretical framework, based on various empirical findings and meta-analysis on the therapeutic process, aiming for delivering an integrative meta-theory for research and practice. The generic model of psychotherapy already formulates relations between the different components and variables of the model, but always on a verbal level, i.e. there is no mathematical conceptualization here.

The field of common factors research is relatively broad and has not produced a coherent, integrative model. With the contextual model of psychotherapy, Wampold and Imel (2015) have formulated a model that describes various pathways of therapeutic processes, but also on a purely verbal level. Cuijpers et al. (2019) and Enck & Zipfel (2019) also present an excellent overview of common factors, which are based primarily on the conceptualization of Lambert & Ogles (2004) and Huibers & Cuijpers (2015). Although these papers extract and describe various effective factors of psychotherapy based on empirical findings, they do not formulate interactions between the variables and do not include any mathematical conceptualization.

The model by Hayes, Hofmann, & Ciarrochi (2020) focuses on biopsychosocial processes of change. The included extended evolutionary meta-model (EEMM) defines dimensions which can be used for process-based diagnosis by applying evolutionary concepts to key dimensions related to human suffering and positive functioning. Although the theoretical integration seems to be quite widespread, interactions between change processes are only occurring on an idiographic level of case conceptualizations at the moment (Hayes, Hofmann, & Stanton, 2020). Meta-relations are missing, and the entire theory remains a verbal theory.

Smaller trans-diagnostic and trans-theoretical models focusing on psychotherapy processes include the CARE Pathway for therapy quality (CARE: caring, attentive, real and empathic, EXPECTANCY, and SPECIFIC) (Wampold & Flückiger, 2023), Lutz et al. (2021) Concentric Circles Model for integrating common outcome predictors, and CORE dimensions (Clinical Outcomes in Routine Evaluation) for assessing subjective well-being, problems, life functioning, and risk (Barkham et al., 2015). Epstein & Epstein (2016) deliver a dual-process personality and psychotherapy theory, for explaining psychotherapy processes trans-diagnostically and trans-theoretically. Meta-analysis by Antichi & Giannini (2023) on moderators for change and Timulak & Creaner (2010) on person-centered/experiential therapies deliver an overview of different mechanisms that are relevant for change and outcome, but do not wrap it into a specific conceptual framework.

There are also several conceptualizations using the dynamic systems paradigm for explaining the psychotherapy process, which include a meta-theoretical framework by Gelo & Salvatore (2016), the meta model of human change by Orsucci (2015), a family therapy focused model by Russell & Breunlin (2019), and a context-responsive integrative framework by Constantino et al. (2013).

Last, there are a few concepts belonging to different therapeutic schools that have more procedural qualities than others. These are the principles formulated by Rogers for personality change (Rogers, 1957, 1958; Rogers & Dymond, 1954), and psychodynamic alliance qualities like transference and countertransference (Kriz, 2014; Wittchen & Hoyer, 2011).

Disorder-specific theoretical models typically contain verbal theories explaining mechanisms of specific disorders. A conceptual paradigm change was initiated by the network models in the last decades. The seminal paper by Borsboom & Cramer (2013) introduced the underlying network paradigm. Haslbeck et al. (2021) further formulated a framework for modeling psychopathologies based on the network approach. Network models for specific disorders are introduced in the chapter on mathematical models. Other disorder specific models are mostly located in cognitive-behavioral therapies. For example, Beck's model of depression (Beck, 1967), Clark's model for panic disorders (D. M. Clark, 1986) or the conceptualizations in the cognitive behavioral analysis system for chronic depression (McCullough, 2006).

Models focusing on the psychological functioning include big frameworks, like the research domain criteria (RDoC) (Insel et al., 2010; RDoC, 2024), a research framework

developed by the National Institute of Mental Health (NIMH) aimed at understanding mental disorders through the study of fundamental dimensions of behavior and their underlying biological systems, various trans-diagnostic processes, like rumination, cognitive fusion, altered metacognition (see Morris & Mansell, 2018 for an overview), or the hierarchical taxonomy of psychopathology which delivers hierarchical categorization for impaired functional areas (Kotov et al., 2017).

Further there are several models conceptualizing the human psyche, like the Freud's famous structure model with the components id, ego and superego (Freud, 1923), the states of mind (ego states) by Horowitz (1987), the structural dynamics developed by Janzarik (1988). This is a systematic approach to understanding psychopathology by examining the interplay between structural components of the psyche and the dynamic processes that influence them. Further, there is the theory of "affect-logic" by Ciompi (1997), a system theory-based approach to understanding mental disorders, with a focusing on schizophrenia and the function of emotions. Tretter & Löffler-Stastka (2018) also describes a framework for psychological functioning, called integrative clinical systems psychology. The category of models focusing on psychological functioning also includes various personality models. These range from descriptive trait-based approaches like the Big Five (Costa & McCrae, 1992) and Big Six (Thalmayer et al., 2011) to more dynamic conceptualizations. Mischel & Shoda (1995) Cognitive-Affective Personality System emphasizes the interplay between personality structure and functioning. Similarly, Cervone (2005) concept of personality architecture views the individual as a complex dynamic processing system. Olthof et al. (2020) describes a complexity theory of psychopathology, conceptualizing a model of psychological functioning based on system theory. There are also therapy-school dependent explanations of psychological functioning, such as schema therapy modus models (Young et al., 2003) and various psychodynamic explanations. This includes the structure levels of personality and basic conflicts in operationalized psychodynamic diagnostics (Cierpka et al., 2014), the concepts of the mentalization-based therapy (Bateman & Fonagy, 2010), supportive-expressive therapy (Luborsky, 1984), and transference-focused therapy (Kernberg et al., 2008).

#### 3.2.1.2. Mathematical Approaches

The category of mathematical theories encompasses models that primarily contain mathematical descriptions of phenomena. This category can also be divided based on the different

foci the models have, i.e. explaining the psychotherapeutic process, a specific disorder or psychological functioning.

Mathematical models with a focus on depicting the psychotherapeutic process are mostly feedback systems, where patients answer frequent questionnaires in order to map the course of the treatment. Depending on the system, these data are partly used to warn in specific symptom constellations or recommend various interventions prospectively. One of these models is the Trier Treatment Navigator (TTN) (Lutz et al., 2019). It is a comprehensive feedback system that combines pre-treatment and adaptive recommendations to personalize psychotherapy decisions, including dropout risk prediction, optimal treatment strategy selection, dynamic risk assessment, and clinical problem-solving tools for treatment adaptation. Another example is the Outcome Questionnaire-45 (Lambert, 2015). It is a tool for routine quality assurance of psychotherapeutic care, including the prediction of a patient's recovery curve based on a standard track developed based on 11,000 patients. The therapist is notified as soon as the patient falls below cut-off. Both concepts rely on a set of factors and sub-questionnaires, which assess the patients's course and aggregate its clinically applicable scores and recommendations. Even if the selection of factors and questionnaires is partly based on existing empirical findings and empirical knowledge, it is not entirely clear how and why the composition used came about. Although there is a certain integration into previous therapeutic research, there is no elaborate theoretical connection or a theory of its own that explains how psychotherapeutic change comes about.

In the research field of network models, Cramer et al. (2016) developed a time-dependent network model of depression, which allows a simulation of individual symptom networks of major depression, based on the degree of connectivity of symptoms as factors of vulnerability/recovery potential. Burger et al. (2022) constructed a network model for eating disorders based on ecological momentary assessment data. Henry et al. (2022) deliver a framework and an example of how the concepts of psychological networks and control theory can be applied. Besides those more recent examples, there are several models simulating the dynamics of disorders. Schiepek et al. (2016) provide an overview, mentioning models of schizophrenia (Ciompi & Müller, 1976; Schaub & Schiepek, 1992; Schiepek et al., 1992), family dynamics (Kriz, 1992), marriage dynamics (Gottman et al., 2005), the emotional valence by therapist and client (Liebovitch et al., 2011) and depression (Demic & Cheng, 2014).

Regarding models conceptualizing general psychological functioning, there are also several concepts using the network-models paradigm. Borsboom (2022) mentions models on general intelligence (Savi et al., 2019; Van Der Maas et al., 2006), attitude change (Dalege et al., 2016) and personality (Costantini & Perugini, 2012). Schöller et al. (2018) refers to models with a neurobiological basis, such as the Virtual Brain (Sanz Leon et al., 2013), a full brain network simulation using biologically realistic connectivity.

#### 3.2.1.3. Theoretical & Mathematical Models

When looking at models, which deliver a verbal and a mathematical theory, are embedded in the existing theoretical landscape, and offer point of contacts for clinical application, only very few models exist. Although the generic model of psychotherapy (Orlinsky, 2009) and the psychological therapy (Grawe, 2004b) are very elaborated frameworks, including different factors and interactions among those, they are purely verbal theories. The same applies for Tretter & Löffler-Stastka (2018) systemic model of the mind Robinaugh et al. (2019) presents a network theory of panic disorder, comprising a theoretical framework based on cognitive-behavioral therapy and a computational model, based on the network theory. The model allows for mathematical recording, description, and explanation of the disorder, as well as a therapeutic application. Lichtwarck-Aschoff et al. (2008) develops a conceptual framework for the development of identity, based on dynamic systems theory. It encompasses two time-related dimensions related to short- and long-term processes, and distinction between static and dynamic approaches. Now coming to the last quadrant of the table - theoretical and mathematical models explaining the psychotherapy process. To our knowledge, there is currently no other model than the one introduced by Schiepek et al. (2017), that contains both a verbal and a formal theory about the temporal course of psychotherapeutic processes, and also has a focus on and enables clinical application. The theoretical background of this model and its connection to existing theories will be the focus of this thesis.

#### 3.2.1.4. Conclusion of the Current Theory Landscape

Table one provides providing a comprehensive overview of the diverse approaches in psychotherapy research across different structural approaches and explanatory focuses. Taking the above findings together, constructing a comprehensive verbal and formal theory of psychotherapy process requires a multifaceted approach that addresses several key aspects. A

crucial element is the trans-theoretical and trans-diagnostic integration of insights from various therapeutic approaches. This integration should encompass at least the four broad categories of experience: emotion, cognition, behavior, and relationships. By utilizing complexity science as a foundation, we can transcend the limitations of individual schools and adopt a more holistic, transdisciplinary approach to understanding psychotherapeutic change processes (Schiepek & Pincus, 2023).

The theory should be presented in both verbal and formal (mathematical) forms. This dual approach, as suggested by Smaldino (2019), allows for better testing and validation of the theory. The verbal component provides a conceptual framework, while the formal component enables precise predictions and rigorous empirical testing. Following Olthof et al. (2020), the theory should aim to describe psychopathology and therapeutic change using a relatively small number of collective variables, balancing the need for comprehensiveness with the practicality of measurement and analysis.

A vital aspect of the theory is the integration of measurement, explanation, and analysis of the therapeutic process. It should bridge the gap between process explanation and measurement by providing tools and methods for measuring psychotherapeutic processes and outcomes, and guiding the analysis of this data. This integration ensures that theoretical concepts are grounded in empirical observation and that collected data is interpreted within a coherent theoretical framework (Schiepek & Pincus, 2023).

To capture the complex reality of human psychology and psychotherapy, the theory should incorporate non-linear measurement and analysis techniques. This approach goes beyond traditional linear and pre-post measurements, enabling the capture of dynamic processes. The theory should provide tools for analyzing time-series data, as suggested by Schiepek & Pincus (2023) and Bringmann et al. (2023), to reveal the intricate dynamics of therapeutic change.

Finally, the theory should allow for both individual-level (idiographic) and group-level (nomothetic) analysis. This dual focus enables the examination of unique individual patterns while also identifying general principles of therapeutic change.

By addressing these aspects, a theory of psychotherapy process can provide a robust framework for understanding, measuring, and enhancing therapeutic change. Such a theory would not only advance our scientific understanding but also inform clinical practice, enabling more personalized and effective interventions. In the following, we will introduce

such a framework, based on the model introduced by Schiepek et al. (2017). As already mentioned, the focus of this thesis will be on the theoretical aspect of this dual theory. The mathematical background can be found in Schiepek et al. (2017), Schöller et al. (2018) and Schöller et al. (2019).

### *3.2.2. Cluster of Variables and Parameters and Corresponding Theories*

An examination of existing models reveals that only a few effectively capture the psychotherapeutic process in its entirety. We have outlined the crucial elements necessary for a comprehensive psychotherapy process model. Our proposed model integrates these requirements, enabling it to capture the dynamics and complexity inherent in the psychotherapeutic process.

In the following section, we provide an overview of several major concepts, demonstrating how their scales align with or can be categorized within our model's dimensions. Our model is designed to be 'open', offering points of connection to existing theories and facilitating the integration of future or other unmentioned models.

**Table 2** (p. 71) illustrates examples of how some existing models can be mapped onto our framework, which consists of five variables (emotion, problem intensity, motivation, insight and success) and four parameters (alliance, cognitive competencies, behavioral resources and motivation as trait). In addition to established concepts, our selection of variables is further supported by factor analysis of the Therapy Process Questionnaire (TPQ) (Schiepek et al., 2019).

It is important to note that our model operates on two levels: variables and parameters. The parameters primarily relate to slowly changing personality aspects. Consequently, models from the process- and psychological functioning domain are particularly relevant to this level of our framework. This dual-level approach allows our model to capture both the dynamic, short-term changes in the therapeutic process and the more gradual shifts in underlying personality structures.

| | Grawe (2000) | Orlinsky (1986) | Common Factors | RDoC | Hayes (2020) EEMM | Mischel (1995) | Antichi & Giannini (2023) | Schaffrath et al. (2022) TTN |
|---|---|---|---|---|---|---|---|---|
| | | | | **Variables** | | | | |
| **E** | need for increasing pleasure and avoiding pain | emotional climate | emotional dimension (Enck & Zipfel, 2019) | positive and negative valence | affect | affects | | affective style questionnaire |
| **P** | mechanism: problem actualization (process activation) | severity, diagnostics | patient variables | | | | symptom levels | risk and suicidality; brief symptom inventory checklist (SCL-90-SL) |
| **M** | Rubicon model (desirability), motivational clarification | personal presence, energy | patient variables | | attention | goals and values | readiness for change | motivation and therapy goals |
| **I** | mechanism: clarification perspective (process activation) | 'learning' the broad sense; therapeutic realizations (insight, catharsis, etc.) | emotional-cognitive dimension (Enck & Zipfel, 2019); process learning factor (Lambert & Ogles, 2004) | | | | insight | |
| **S** | need for self-enhancement | in-session impacts | factor behavior and success (Enck & Zipfel, 2019) | | | | | social support and critical life events |
| | | | | **Parameters** | | | | |
| **a** | need for attachment | therapeutic bond; subjective realm of inner and outer experience | interaction, quality and process characteristics (Enck & Zipfel, 2019); interaction (Lambert & Ogles, 2004) | social systems affiliation and attachment | self | | interpersonal functioning / cognitions/ avoidance, quality of object relationships | therapeutic alliance |

| | Grawe (2000) | Orlinsky (1986) | Common Factors | RDoC | Hayes (2020) EEMM | Mischel (1995) | Antichi & Giannini (2023) | Schaffrath et al. (2022) TTN |
|---|---|---|---|---|---|---|---|---|
| **c** | mechanism: intention realization | self-relatedness, object relations, mind & personality, cognitive traits | cognitive dimension (Enck & Zipfel, 2019); process learning (Lambert & Ogles, 2004) | cognitive system, social processes | cognition | self-regulatory plans & competencies | mentalization, affective awareness, emotion regulation | emotion and self-regulation |
| **r** | mechanism: resource activation | personal resources | behavioral regulation (Enck & Zipfel, 2019); common factors: process action (Lambert & Ogles, 2004) | | overt behavior | self-regulatory plans & competencies | compensatory skills | |
| **m** | mechanism: intention modification (motivational clarification) | motivational traits | patient variables; placebo effects; | | motivation | expectancy beliefs | assertiveness, agency; externalizing difficulties, self-efficacy | treatment expectations questionnaire (before therapy) |

***Table 2: Cluster of variables and parameters with the corresponding theories****, beneath psychological psychotherapy by Grawe (2000), generic model of psychotherapy by Orlinsky (1986), common factors (Enck & Zipfel, 2019; Lambert & Ogles, 2004), research domain criteria (RDoC), extended evolutionary meta model (EEMM) by Hayes (2020), cognitive-affective system theory of personality by Mischel (1995), meta-analysis on working mechanisms by Antichi & Giannini (2023) and the Trier treatment navigator (TTN) by Schaffrath et al. (2022)*

The most prominent integrative model of psychotherapy is probably the psychological therapy approach by Grawe (2000). It includes several working mechanisms (intention realization, intention modification, process activation, resource activation) and basic needs (orientation and control, increasing pleasure and avoiding pain, attachment, self-enhancement), which can be aligned with our model. The need for increasing pleasure and avoiding pain can be mapped with the variable E (emotions), as pain is reflected with negative emotions and increases in pleasure with positive emotions. The mechanism of problem actualization, combined with process activation, describes the technique of activating problems and

problematic behavior, emotions and cognitions during therapy, especially through activating interventions, which is reflected on the one hand by the variable P, which covers the patients' symptom severity and the variable I, which covers insightful processes gained by procedural activating interventions. I also overlaps with the mechanism of clarification, as confronting with arousing material helps to clarify the intentions (Grawe, 2004b). The variable M also reflects aspects of the process of motivational clarification and the desirability mentioned within the used Rubicon Model. The variable S is an important indicator of the general satisfaction of needs, and especially the need for self-enhancement. Regarding the parameters, the need for attachment can be assigned to the parameter a alliance. The parameter c (cognitive competencies) encompasses mechanisms that help the process of intention realization, which has also a certain overlap with the parameter m, as it includes concepts of expectancy and self-efficacy. m further covers the mechanism of intention modification, as an alteration in self-efficacy and expectancies beliefs is reflected in changes of m. Lastly the parameter r comprises resources and behavioral competencies, which are also emphasized within Grawe's model under the term of resource activation, giving attention to the patients' positive sides, capabilities and skills.

The generic model of psychotherapy by Orlinsky (2009) has also several components, which can be integrated in our model. The variable emotion (E) reflects the emotional aspects during therapy framed as the emotional climate. Problem intensity (P) coincides with the factor severity and diagnostics (symptoms). The motivational component during therapy is covered by M in our model and under the term personal presence and energy in the generic model. The process of learning "in its broadest sense" (Orlinsky, 2009, p. 330) and gaining therapeutic realizations, like insights and catharsis, aligns with our variable I insight. Success experiences (S) partly cover the in-session impacts mentioned in the generic model. Both models give the therapeutic alliance a central role. In our model, it is the parameter a, that covers the alliance, and in the generic model, the factors therapeutic bond and subjective realm of inner and outer experience. The emphasized self-relatedness of therapeutic models mentioned by the generic models is foremost reflected in the general construction of our model, as the patient's experience is the central point of interest, assessment, and analysis. Additionally covers the parameter c concepts, which help to grasp the quality of self-relatedness, i.e. object relations, mentalization, level of structure (Cierpka et al., 2014) in our terms. In terms of the generic model, the concepts of mind and personality

are mentioned, as well as cognitive traits. Both models include the parameter r of behavioral and personal resources, and the parameter m motivational traits.

In common factors research, there are many variables and mechanisms mentioned. We focus on the categorizations made by Enck & Zipfel (2019), Huibers & Cuijpers (2015), Cuijpers et al. (2019), Wampold et al. (2018), Fiedler (2012) and Lambert & Ogles (2004). Enck & Zipfel (2019) clusters an emotional dimension matching our variable E. Motivation to change, problem intensity and symptom severity are aggregated under the term of patient factors and are covered by the variables M and P (Fiedler, 2012). Insight processes, reflected by the variable I, are mentioned in the emotional and cognitive dimensions by Enck & Zipfel (2019) and under process learning factors by Lambert & Ogles (2004). Enck & Zipfel (2019) further describes the importance of experiencing success within the behavioral dimension, matching to the variable S in our model. Regarding parameters, every concept includes the therapeutic alliance. In our case, it is the parameter a, Enck & Zipfel (2019) and Lambert & Ogles (2004) summarizes the aspects of interaction factors, other concepts mention it under the term of quality- and process aspects (Fiedler, 2012). Cognitive competencies (c) are also included in the cognitive dimension (Enck & Zipfel, 2019) and process learning factors (Lambert & Ogles, 2004). The dimensions of behavioral regulation (Enck & Zipfel, 2019) and process action (Lambert & Ogles, 2004) align with the parameter behavioral resources (r). Motivation as trait (m) is partly covered with patient factors and placebo effects (Enck & Zipfel, 2019; Fiedler, 2012), as it includes self-efficacy beliefs, hope for healing, therapy-benefiting attributions, which are categorized as placebo effects when working in a purely medical context, but are desired effects in psychotherapy.

Several domains of the research domain criteria (RDoC, 2024) are also covered by our model. The domain of positive and negative valence is covered by E, the domain of social systems, affiliation and attachment by a, the domain of cognitions by c, the domain of overt behavior by r, and last, motivation by m. The same applies to the other concepts included in **Table 2** (p. 71) . E covers the factors of affect, mentioned by Hayes, Hofmann, & Ciarrochi (2020) (extended evolutionary meta model: EEMM) and Mischel & Shoda (1995), and is assessed by a set of affective style questionnaires in the Trier Treatment Navigator (TTN) (Lutz et al., 2019). In addition, it evaluates symptom severity by utilizing the short version of the symptom inventory checklist (SCL-90-SL) and combining it into a risk/suicidality indicator. Problem intensity is also assessed in our model (P) and the risk can be derived from an analysis of the dynamics. Antichi & Giannini (2023) extracted symptom

severity also as an important factor impacting psychotherapy processes. The dimension of motivation (M) is included in all the other concepts as well. Hayes, Hofmann, & Ciarrochi (2020) assign it to an attentional factor, Mischel & Shoda (1995) calls it goals and values, Antichi & Giannini (2023) readiness for change and TTN uses the indicator of motivation/therapy goals. Insight (I) is mentioned in the meta-analysis by Antichi & Giannini (2023) as an important change mechanism. Success (S) might be partly reflected in the comprehensive category of social support and critical life events of the TTN. Although, critical events are becoming visible through the course of the therapy in the dynamics of the different variables. The parameters can also be spotted in the different models and concepts. Alliance (a) aligns with the domain of self in the EEMM, interpersonal functioning and quality of object relations in the meta-analysis by Antichi & Giannini (2023) and the indicator of therapeutic alliance in the TTN. Cognition (c) is included in every model: as cognition in the EEMM, as self-regulatory competencies in Mischel & Shoda (1995), as mentalization, affective awareness and emotion regulation by Antichi & Giannini (2023), and as emotion- and self-regulation in the TTN. The EEMM, Antichi & Giannini (2023) and Mischel & Shoda (1995) mention overt behavior, compensatory skills and competencies to regulate behavior, fitting all to the parameter of behavioral resources (r). Motivation as trait (m) has equivalents in all presented models: motivation in the EEMM, expectancy believes (Mischel & Shoda, 1995), assertiveness, agency and self-efficacy (Antichi & Giannini, 2023), as well as treatment expectations in the TTN, which is assessed before therapy. Further concepts, which are applying and supporting different single parameters and variables, are discussed in the respective chapter of the variable/parameter, as well as in the included tables in every chapter.

By integrating these various elements and maintaining an open structure, our model aims to provide a comprehensive yet flexible framework for understanding and analyzing the psychotherapeutic process. This approach not only synthesizes existing knowledge, but also creates a platform for future developments in psychotherapy research and practice. The following chapters will elaborate on each variable, parameter and their interactions, as well as the connections to existing theories, concepts, and research.

## 3.3. The 5 Variables

After describing the selection and composition of the variables of the model, a definition and description of the five variables and four parameters follows. Each variable and parameter is embedded into the context of psychological theories, research in clinical psychology, and neuropsychological correlates.

**Figure 5** (p. 75) depicts a matrix of the five variables, color-coded by the different theories that support each variable. In APPENDIX C: MATRIX OF THE VARIABLES (P. 326) a detailed version of the matrix below can be found, depicting every included theory by name and color-coded.

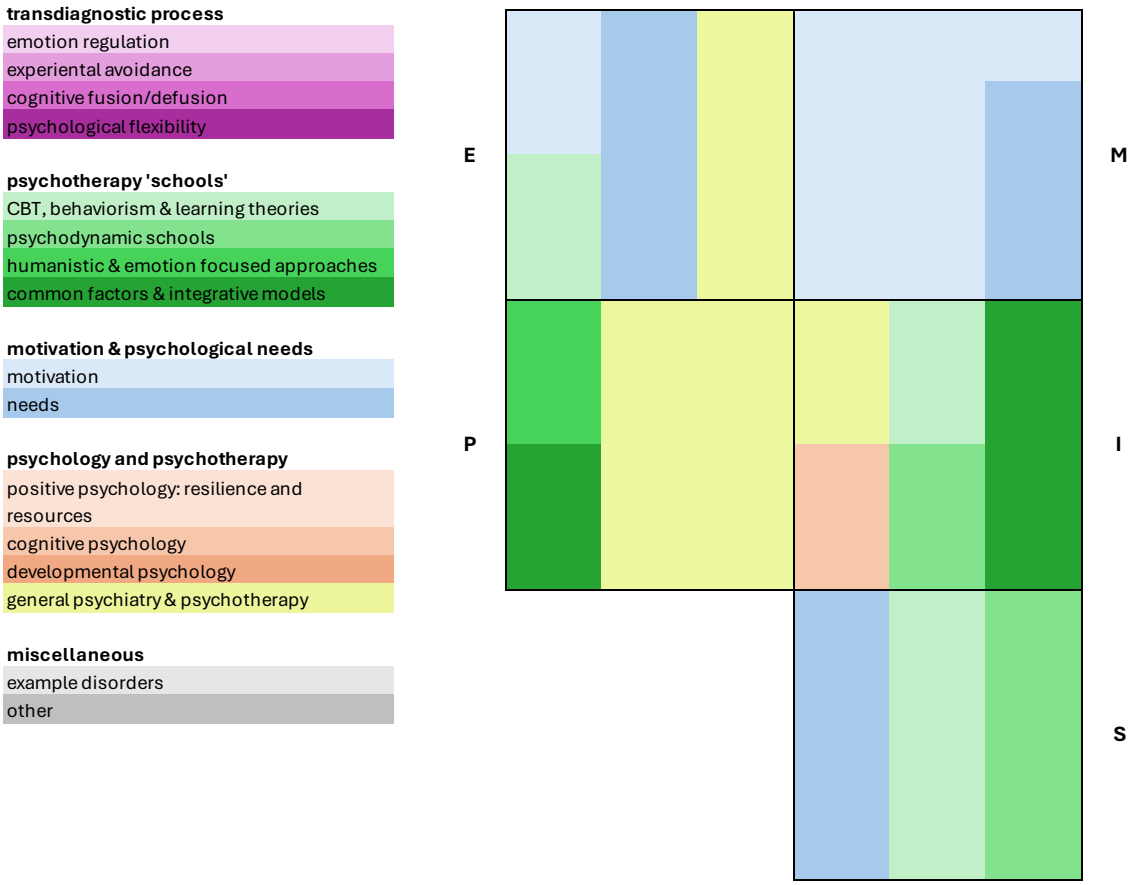



***Figure 5**: Matrix of the five variables, color-coding the different theories that support each variable. The color-coding is depicted in the legend left to the matrix. A detailed matrix can be found in the appendix.*

### 3.3.1. Variable E - Emotion

| Author/Group | Theory | Reference |
|---|---|---|
| Baumeister | core affect: distinction of desirable and undesirable | (Baumeister et al., 2001) |
| Grawe | need for increasing pleasure and avoiding pain | (Grawe, 2000) |
| Freud | pleasure and displeasure | (Grawe, 2000) |
| Behaviorists | reinforcement and punishment | (Grawe, 2000) |
| Watson | positive and negative affect scale (PANAS) | (Watson et al., 1988) |
| Research Domain Criteria | positive and negative valence system | (RDoC, 2024) |

***Table 3:*** *Theoretical concepts related to E.*

The first variable in our model is emotion (E). It refers to positive and negative emotions. We are using a bi-dimensional approach to emotions, i.e. arranging emotions on a spectrum with positive emotions on one end (e.g. self-esteem, joy or flow) and dysphoric emotional experiences on the other (higher) end (e.g. grief, guilt, shame, anger and anxiety) (Schiepek et al., 2017). **Table 3** (p. 76) summarizes theoretical concepts related to E.

#### 3.3.1.1. Good and Bad

There are several reasons for creating a bidimensional variable. First, the distinction between *good* and *bad* is one of the most fundamental distinctions humans make at almost every age, and even animals do so (Baumeister et al., 2001). Baumeister et al. (2001) define *good* as "desirable, beneficial, or pleasant outcomes including states or consequences" (p. 2). *Bad* is defined as the opposite: "undesirable, harmful, or unpleasant" (Baumeister et al., 2001, p. 3). They also define the strength as the "causal impact" (Baumeister et al., 2001, p. 3), which corresponds to the intensity in our model (pictured with the height of the curve).

Good and bad are a fundamental distinction not only on a philosophical level, but there is also accumulating evidence, that emotions and core affects (see Russell (2003) and Barrett et al. (2007) for the concept of core affect) have the distinction of pleasure or displeasure at heart (Barrett et al., 2007; Izard, 2009; Russell, 2003). Even scales assessing discrete

emotions seem to "provide strong evidence of a common core of pleasant and unpleasant feelings" (Barrett et al., 2007, p. 378).

The bi-dimensionality of emotions is also implemented in Grawe's psychological psychotherapy. According to Freud's principle, one of the four basic needs is the need for increasing pleasure and avoiding pain (Grawe, 2004b).

> *Pleasure and displeasure are inherent components of people's biological templates. This becomes even more obvious when we consider that our innate affective reaction systems are designed to produce these two experiential qualities. Pleasure and displeasure are perceived from the very beginning of our lives, and throughout life they remain the most important feedback in the development of optimally adjusted behavior. With their emphasis on the principles of reinforcement and punishment, behaviorists viewed the regulation of pleasure/displeasure as the most important psychological regulatory principle of all. At least in this respect, they seemed to agree with Freud. (Grawe, 2004b, p. 319)*

Hence, including a variable E, which depicts the changes of the most basal affective system, is essential when building a model describing the psychotherapeutic process. Common factor approaches, like the synthesis by Enck & Zipfel (2019), include an emotional dimension as well, which reflects the up and downs and affective aspects of the therapeutic process (Enck & Zipfel, 2019; see also Huibers & Cuijpers, 2015; Lambert & Ogles, 2004; Tretter & Löffler-Stastka, 2018). The Research Domain Criteria (RDoC) also use a binary valence system of positive and negative valence (RDoC, 2024).

The distinction is also well established in the emotion-related research, e.g. reflected by the widespread usage of the Positive and Negative Affect Scale (PANAS) (Barrett et al., 2007; Harmon-Jones, 2019; Watson et al., 1988) or the Flourishing Scale measuring subjective well-being also with positive and negative affect (Diener et al., 2010).

#### 3.3.1.2. Practical Reasons

Second, there are, besides the theoretical reasons, practical reasons for the valence-based assessment of emotions. As Diener et al. (2010) argues, "although clinical practitioners often want to access specific feelings such as depression, a common goal of well-being researchers is to assess positive and negative feelings in general" (Diener et al., 2010, p. 145).

The aim of our dimension of *emotion* is assessing the dynamics of feelings and mood of a person, in order to capture if a person is more often in a desirable or non desirable state. The reason for this can best be explained by the broaden-and-build hypothesis by Barbara

L. Fredrickson (Fredrickson, 2001; Fredrickson, 2004). It hypothesizes negative emotions narrow the "momentary thought-action repertoire to promote quick and decisive action" in order to manage threatening situations fast (Fredrickson, 2004, p. 1396). In contrast to that, positive emotions shall only occur in non-threatening situations, where it is safe to engage with the environment. They

> *Have a complementary effect: relative to neutral states and routine action, positive emotions broaden peoples' momentary thought–action repertoires, widening the array of the thoughts and actions that come to mind. (...) the broadened thought–action repertoires triggered by positive emotions are beneficial in other ways. Specifically, broadened mindsets carry indirect and long-term adaptive benefits because broadening builds enduring personal resources. (p.1369)*

So, a valence-based distinction of positive and negative emotions does not allow a precise categorization of the current states. However, the distinction allows a dimensional classification of the state/mood the person has regarding the options that are available for the person: negative emotions are more narrowing the horizon of thought, action etc., positive emotions provide more possibilities. This approach is specifically interesting in the framework of synergetics, where we are using an attractor-based metaphor/model for the disorders. Speaking within the landscape metaphor (see PART 3: MENTAL DISORDERS AS COMPLEX SYSTEMS (P. 40)) positive emotions could allow a shallowing of the dysfunctional attractor valley.

Lyubomirsky et al. (2005) underlines the same idea of Fredrickson's broaden-and-build hypothesis:

> *Positively valenced moods and emotions lead people to think, feel, and act in ways that promote both resource building and involvement with approach goals (Elliot & Thrash, 2002; Lyubomirsky, 2001). (pp.803)*

Positive emotions are an indicator if the current state/situation is desirable. I.e. a positive mood is an indicator for a desirable state, which might lead to a higher probability of repeating that behavior. Again, this could be translated to the beginning of building a new attractor.

Hence, a valence-based distinction of emotions could be a more useful classification in order to assess possible influences and changes on longer term moods and then long-term traits, than the assessment of precise categories of emotions. However, specific categories of emotions are, of course, still part of therapy and the patient-therapist interaction. Additionally, they could also be assessed with the open text field in the synergetic navigation system (SNS) questionnaire right below the emotional-valence questions, to provide

specific information for interventions or problems that can be targeted within the therapy sessions.

#### 3.3.1.3. Factor Analysis of TPQ

Third, a factor analysis of the therapy process questionnaire (TPQ) revealed a polarity of emotions as well, supporting the bi-dimensional approach to the variable E Emotion (Haken & Schiepek, 2010; Schiepek et al., 2019).

#### 3.3.1.4. Neurobiological Correlates of Emotions

Conceptualizing emotions bi-dimensionally in terms of positive and negative valence is also supported from a neurobiological perspective. A meta-analysis of neuroimaging studies by Lindquist et al. (2016) reveals that both positive and negative emotions engage a common set of brain regions, including the anterior insula, orbitofrontal cortex, amygdala, and ventral striatum. This brain-wide representation suggests that valence is not isolated to specific areas but is distributed across a "flexible affective workspace" (Alexander et al., 2021, p. 227). While many brain regions respond to both positive and negative valence, some areas like the left amygdala and anterior insula show a relative preference for negative affect. This framework acknowledges that emotional experiences often exist on a continuum between positive and negative, rather than as discrete categories, which is consistent with the overlapping neural activations observed in studies (Alexander et al., 2021; Lindquist et al., 2016).

Taken together, a valence-based approach to emotion assessment seems under theoretical, as well as practical and data-based perspective a pragmatic choice.

### 3.3.2. Variable P - Problem Intensity

| Author/Group | Theory | Reference |
|---|---|---|
| Rogers, Kriz | state of incongruence | (Kriz, 2014; Rogers, 1957) |
| Common Factors | symptom severity as part of the patient variable | (Fiedler, 2012) |
| Seligman | symptom severity central to pathologies | (Seligman, 2019) |
| Severity as central assessment of pathologies | hierarchical taxonomy of psychopathology | (Kotov et al., 2017) |
| | symptom severity checklist 90 | (Vaurio, 2011) |
| | therapy process questionnaire | (Schiepek et al., 2019) |

***Table 4:*** *Theoretical concepts related to P.*

The second variable in our model is problem intensity (P). It represents the patient's symptom severity, experienced incongruence or conflicts, as well as problem and stress intensity. As all measures in our model, it is disorder-independent, hence not symptom-specific. **Table 4** (p. 80) summarizes the theoretical concepts related to P.

Psychological strain, as covered with P, is one of the key aspects of psychological disorders (Sack, 2019). Disorders lead to or go along with limitations. Because of those limitations, the possibilities to realize needs are restricted and, thereby, needs are often frustrated, which leads to psychological strain (Scharfetter, 2020). This psychological strain is often the central reason patients seek therapy than the limitation themselves (Margraf & Schneider, 2009b). The very close relation between problem intensity and motivation is further explored in FUNCTION P → M (P. 198) . Others have called psychological strain as a state of incongruence (Kriz, 2014; Rogers, 1957). Rogers, for example, defined the client's role as someone who is in a state of incongruence, i.e. a conflictual condition because of a lack of self-actualization (a process aligning needs and reality and processing experiences) (Rogers, 1957). Here, the strain caused by incongruence is central to the person seeking therapy. Symptom severity is also part of the patient's variables brought into the therapeutic process, as conceptualized within the common factors research (Fiedler, 2012).

Even though positives measures, such as quality of life or subjective well-being, have also been shown to be important to the experience of mental disorders and recovery thereof,

symptom severity itself is still central to pathologies (Seligman, 2019). The best example, therefore, are the classification systems for mental disorders, such as the International Classification of Diseases (ICD) or Diagnostic and Statistical Manual of Mental Disorders (DSM). Symptom severity is a criterium in almost every disorder, from psychiatric to physical illnesses. However, a uniform definition is missing (Zimmerman et al., 2018). Zimmerman et al. (2018, p. 260) deliver an overview of what is used for measuring severity in different disorders in the DSM-5. There you can see that it varies from number of symptoms (e.g. in depression) to the duration of the disorders. The DSM-3 and DSM-4 included a scale for assessing symptom severity disorder-overarching, the Global Assessment of Functioning Scale (GAF). Even though it was dropped in DSM-5 because of its complexity and low reliability measures, the attempt and its wide usage is a good indicator of the need for assessing the patients' general strain (Grootenboer et al., 2012; Zimmerman et al., 2018). Besides the GAF there are several established scales for assessing overall symptom severity and general strain, such as the hierarchical taxonomy of psychopathology (HiTOP) (Kotov et al., 2017, 2018), symptom severity checklist 90 (Derogatis et al., 1974; Vaurio, 2011) or the therapy process questionnaire (TPQ, subscale problem intensity assessing the subjective symptom severity) (Haken & Schiepek, 2010; Schiepek et al., 2019; Schiepek, Schöller, et al., 2022). Vaurio (2011) outlines nicely why the general assessment of psychological strain is and has been very useful for clinical practice:

> *Shortly after Adolph Meyer of Johns Hopkins University developed the first clinician-observer psychiatric rating scale at the turn of the twentieth century, Robert Woodworth introduced a self-rating scale of psychiatric symptoms. Such measures were of great utility, as they allowed assessment of symptomatology that may not be directly observable by clinicians (e.g., subjective distress) and also allowed more efficient assessment of psychiatric symptoms, particularly when access to trained clinicians may be limited, as was the case when the scales were created during World War I. (Vaurio, 2011, p. 2448)*

Zimmerman et al. (2018) further argues that the general level of severity might be even more important in clinical practice than meeting specific criteria of classification systems, as the severity might be more correlated to some outcomes than specific diagnostic criteria (Eaton et al., 2013; Kotov et al., 2017). Cleeland (2007) suggests the concept of symptom burden, which "encompasses both the severity of symptoms and the patient's perception of the impact of symptoms" (Cleeland, 2007, p. 16). This also sheds light on the aspect of the perception and meaning of the symptoms for the patient.

Also, when looking from a therapeutic perspective on problem intensity, it is an important factor for guiding the therapeutic process. Again mentioning Grawe (2000) in this case: he

nicely described the usage of the patient's problems as an important therapeutic mechanism of action and intervention, called problem actualization. Through specifically focusing on the conflicts and incongruences, the patients might develop more clarity in his/her needs. This process was similarly expressed by Rogers and is closely linked to the process of insight (Rogers, 1957, 1958; Rogers & Dymond, 1954).

Summing up, problem intensity might be one of the most important factors in mental disorders, therapeutic mechanisms, and therapy motivation. As symptom severity is usually linked to disorder classifications, and accordingly, their limitations, our model focuses on subjective symptom severity as a measurement of experienced psychological strain and distress. We argue that especially the patient's perspective on his/her incongruence might be one of the most critical variables guiding the therapeutic process, as it is closely linked to many other important constructs, such as motivation and the therapeutic alliance (Tschuschke et al., 2015). It is a good indicator of therapy success/failure (symptom relief, reduced P) and, with that, an indicator of the need to change or maintain the therapeutic strategy.

### *3.3.3. Variable M - Motivation*

| Author/Group | Theory | Reference |
|---|---|---|
| Wassermann et al. | Motivation as a construct for purposeful and goal-directed behavior | (Wasserman & Wasserman, 2020) |
| Deci & Ryan | self-determination theory (SDT): interconnectedness of motivation and psychotherapeutic change | (Ryan et al., 2011) |
| Grawe | Rubicon model as a metaphor for different phases of motivation, volition and action | (Grawe, 2000; Heckhausen et al., 2013) |
| Prochaska | trans-theoretical model of change | (Prochaska & Velicer, 1997) |

***Table 5:*** *Theoretical concepts related to M.*

The third of the five included variables in our model is motivation. As all pf the variables describe state-like concepts, moving on a faster time scale than parameters, the variable motivation (M) refers to state-like motivation for change. This contrasts with the later outlined parameter motivation to change as trait-like disposition (see PARAMETER M - MOTIVATION TO CHANGE AS TRAIT (P. 124)). Therefore, M describes the situational motivation to change, the readiness for engagement in experiences and therapy-related activities, on a moment-to-moment and day-to-day basis. **Table 5** (p. 83) summarizes the theoretical concepts related to M.

#### 3.3.3.1. Definitions Motivation

The field of motivational psychology is big. It lacks precise definitions of the different constructs (Wasserman & Wasserman, 2020). However, as a starting point, the broad definition proposed by Wasserman & Wasserman (2020) can be used. It describes motivation as a "complex mind-based construct that is used to describe, define, and/or account for purposeful, goal-directed aspects of human behavior" (Wassermann & Wassermann, 2020, p. 3).

Hence, the core of motivation is its role as a driving force to change behavior. Ryan et al. (2011) even go one step further and map motivation as a combination of energy and direction. The direction is set by needs, i.e. motivation indicates which needs to be satisfied, or goals, which the individual set for him/herself (Tretter & Löffler-Stastka, 2018). Holtforth & Michalak (2012) even claim that psychopathologies are a result from long-term

insufficiently satisfied needs and that the primary goal of psychotherapy is a satisfaction of those and finding a better way to satisfy them.

#### 3.3.3.2. Motivation in the Change Process

Therefore, in psychotherapy, motivation is an important indicator of how ready and willing a patient is to engage in difficult and challenging therapeutic tasks, and even how well the therapy is going (Holtforth & Michalak, 2012; Ryan et al., 2011; Ryan & Deci, 2008). However, the terms used for motivation are versatile: stages of change, client involvement, acceptability, cooperation, readiness, engagement (Ryan & Deci, 2008). In our case, we stick to the term motivation, or state motivation. Different models of motivation emphasize the role of motivation in the change process. Ryan et al. (2011) argue that:

> *Insofar as counseling [i.e. psychotherapy] is about creating conditions for positive change, it follows that motivation is deeply intertwined with such change. There is simply no change without movement and no movement without motivation. (Ryan et al., 2011, p. 199)*

Based on their self-determination theory (SDT), they outline that one of the most important points of change is intrinsic motivation (Ryan & Deci, 2008).

In his integrative conception of psychotherapy, Grawe (2000) the point of actively changing a behavior plays an important role in psychotherapy. He uses the Rubicon model by Heckhausen et al. (2013) to demonstrate his concept. In the model, there are different phases of (pre)-action, from motivation to volition and action. The motivational phase is the direct precursor of passing the 'Rubicon'[1], i.e. the point from hesitating to going into action.

The crossing of the Rubicon is also expressed in the phases of contemplation and preparation in a trans-theoretical model of change (TMoC) by Prochaska & Velicer (1997). The model outlines different stages of change, which might be comparable to different stages of motivation (Prochaska & DiClemente, 1982). The most important confirmed assumptions made by the model are the following (Holtforth & Michalak, 2012; Krebs et al., 2018): first, motivation is a process that unfolds over time. This perfectly fits in our model of change process, which has the temporal component as key factor. Second, patients are motivated differently when starting a therapy, but also during the therapy. A meta-analysis of

[1] Rubicon is a river in Italy. It gained historical significance when Julius Caesar crossed it with his legions, famously declaring "Alea jacta est" (the die is cast). This decisive action marked Caesar's final, with no possibility of turning back (Grawe, 2004, p.49).

over 76 studies and over 25.000 patients showed that there is a close relation between state of motivation and treatment outcomes, i.e. the more motivated a patient is the better are the treatment outcomes (Krebs et al., 2018). This implies the importance of a high-frequent assessment of motivation during the therapeutic process to respond to possible dynamics. This connects directly to the third conclusion that is drawn by the TMoC (Prochaska & DiClemente, 1982; Prochaska & Velicer, 1997), that therapeutic steps have to be adapted to the stage the patient is currently in to improve outcome and the therapeutic alliance (Krebs et al., 2018). This already hints at the important role of the therapeutic relationship when looking at motivation in psychotherapy. Ryan & Deci (2008) describe the role of the therapist as a helper to grow the patient's internal motivation rather than being an external motivator (Prochaska & DiClemente, 1982; Ryan et al., 2011; Ryan & Deci, 2008; Scheel, 2011). This brings us again to the SDT, which kind of explains the mechanism of action of the TMoC (Ryan et al., 2011). The therapeutic relationship is assumed to foster the need for autonomy and, with that, the intrinsic motivation by providing a safe environment. The role of motivation in the therapeutic process is examined in more detail in Function M → I (p. 177), Open for Discussion: Function I → M (p. 172) and Equation: M - Motivation (p. 232). An analytical overview of the role of motivation and therapeutic implementation in different therapeutic approaches can be found in Ryan et al. (2011) and Scheel (2011).

Although state-motivation plays an important role in the therapeutic process, it has long been disregarded in psychotherapy research, because the focus was on the effecting mechanisms of the therapist and the therapeutic relationship, rather than on client factors (Ryan & Deci, 2008; Scheel, 2011). However, motivation as one of the most important factors in the psychotherapeutic process on the client's side has now been widely established as a part of the common factors (Ryan & Deci, 2008; Wampold, 2001; Wampold et al., 2018).

#### 3.3.3.3. Neurobiological Correlates of Motivation

On a neurobiological level, there are many structures involved in the motivational process. Some of the important biological substrates are the amygdala, the striatum and parts of the frontal cortices (Schultheiss & Wirth, 2018; Wasserman & Wasserman, 2020). Schultheiss & Wirth (2018) explain the interaction of those structures (a visualization can also be found in Schultheiss & Wirth, 2018, p. 18; and Wasserman & Wasserman, 2020, p. 47):

> *Motivational processes rely on these three structures to act in concert, such that cues that predict (amygdala) stimuli that have been experienced as pleasant*

> *(orbitofrontal cortex) elicit behavioral selection and invigoration (striatal dopamine system) directed at reward attainment. (Schultheiss & Wirth, 2018, p. 428)*

Before going deeper into the neural substrates, the definition of Wasserman & Wasserman (2020) is introduced. They call motivation as the potential to act, i.e. behavior or the preparation of such already indicates motivation. This directly connects to the definition of motivation by Ryan et al. (2011) of *Motivation = Energy + Direction*, and their introduction of the phrase motivation going back to the Latin term "movere" which means moving. In conclusion, motivation is tightly connected to movement, i.e. behavior and hence, in the following parts regarding the neurobiological aspects of motivation, movement/behavior will be used as indicators of motivation.

According to Schultheiss & Wirth (2018) motivation can be divided in two parts: the motivational phase, which includes working towards a goal, and the evaluation phase of the goal attainment. This already shows the tight connection of motivation to success, which is further examined in FUNCTION M → S (P. 181) and FUNCTION S → M (P. 217) . The first phase implies it is not only important to move but also to be motivated to do so and with that to decide where to move towards to (Schultheiss & Wirth, 2018). The globus pallidus, subthalamic areas, as well as the striatum are involved in the behavior's selection. This kind of gating/control-process decides which goals become goal-directed motivation (Wasserman & Wasserman, 2020). The basal ganglia facilitate the execution of approach or avoidance behavior (Wasserman & Wasserman, 2020). The second phase of evaluating the executed behavior plays an important role, especially in learning. An important structure here is the amygdala, which is to recognize awards and punishments (Schultheiss & Wirth, 2018). It is involved in classical conditioning, which is an important tool in cognitive-behavioral therapy. Further, the striatum is also not only involved in selecting but also rewarding behavior through its dopamine-sensitivity, i.e. the process of motivation and learning (i.e. learning what is better to do again) is tightly connected (Schultheiss & Wirth, 2018).

On a higher cognitive level, the lateral prefrontal cortex (LPFC) plays a guiding role and regulates the actions happening in the striatum (Schultheiss & Wirth, 2018). For example, it can inhibit actually satisfying and highly motivated behavior, as going out on a sunny day, in order to pursue long-term goals, as learning for an exam (Schultheiss & Wirth, 2018).

Understanding the role of motivation, especially in mental disorders, from a neuropsychological perspective provides valuable insights for explanation and treatment. While motivation and emotion are closely related, research suggests that they can be distinguished neurologically. Studies on frontal resting activity have shown that frontal activity patterns can differentiate between approach and avoidance motivation, but not between specific emotions (Harmon-Jones et al., 2010). This provides further support for separating trait motivation from emotions in neuropsychological models. For example, recent perspectives suggest that certain forms of attention deficit disorder might be better understood through the lens of motivated arousal rather than purely attentional processes (Wasserman & Wasserman, 2020). Similarly, depressive disorders often exhibit impaired reward processing and reduced motivation, contributing to symptoms such as anhedonia and reduced goal-directed behavior (Pizzagalli et al., 2008). When looking at specific disorders, the amygdala plays a crucial role in associating stimuli with rewards (Murray, 2007). Its interaction with the limbic striatum is particularly relevant to understanding motivational disorders (Wasserman & Wasserman, 2020). Disruption to the limbic loop of the fronto-striatal system can result in athymhormia, characterized by a lack of spontaneous action and reduced spontaneous thinking (Habib, 2004). Further exists and interaction between motivation and cognitive control, which is mediated by dopaminergic pathways, which play a crucial role in both motivation and cognitive function (Botvinick & Braver, 2015). Disruptions to this motivation-cognitive control network might contribute to a wide range of mental disorders, including attention deficit disorders, depression, and addiction.

This neuropsychological perspective on motivation in mental disorders suggests that interventions targeting motivational processes could be effective in addressing various mental health conditions. Given these considerations, it is imperative that a comprehensive psychotherapy process model incorporates interactions among motivational, emotional, and cognitive constructs. Such integration is crucial for accurately representing the dynamic nature of human change processes. By encompassing these multifaceted interactions, the model can more effectively capture the complex interplay of factors that underlie psychological transformation and therapeutic outcomes.

### 3.3.4. Variable I - Insight

| Author/Group | Theory | Reference |
|---|---|---|
| Problem Solving | insight in the problem-solving process | (Bowden et al., 2005; Weisberg, 2015) |
| Psychotherapy | conscious meaning shift | (Hill et al., 2007) |
| Grawe | clarification perspective | (Grawe, 2000) |
| Psychodynamic Approaches | immediate experiencing | (Johansson et al., 2010) |
| CBT | exposition treatments: imagery rescripting (trauma), exposition therapy (anxiety, OCD) | (Foa et al., 2014; Margraf & Schneider, 2018b) |
| Common Factors | insight as a process-/learning factor | (Enck & Zipfel, 2019; Huibers & Cuijpers, 2015) |

***Table 6**: Theoretical concepts related to I.*

The fourth variable in our model is insight (I). It describes the patient's process of gaining new perspectives on him/herself, contextualizing problems, cognitions, motivations, behavior or emotions and becoming aware of their relations. This can happen within the therapeutic process or through confrontation with conflicts, avoided behaviors and cognitions, as it is often the case in anxiety or obsessive-compulsive-disorders; as well as the confrontation with repressed traumatic experiences (Schiepek et al., 2017; Schöller et al., 2018; Schöller et al., 2019).

The term insight is used in many areas of research and practice, e.g. psychotherapy, problem solving, as well as a phenomenon within the experiences made with psychodelic drugs, delusions in schizophrenia and meditation (for an overview see Tulver et al., 2023). It usually refers to an enlightened moment which leads to a new quality and differs from continuous rational thinking. In the following, we will shortly introduce the concept of insight into problem solving, followed by the understanding of the term in psychotherapy, and concluding with an integrative definition of insight. **Table 6** (p. 88) summarizes the theoretical concepts related to I.

#### 3.3.4.1. Insight in Problem Solving

Beginning with the area of problems solving, there is a distinction between an algorithmic/trial-and-error approach and the non-linear insight-like way. Bowden et al. (2005) defines insight as a surpassing of previous unwarranted assumption or building of "novel, task-related connections between existing concepts or skills" (Bowden et al., 2005, p. 321). Weisberg (2015) even defines the process itself, as a

> *Chain of events that comprise the solution of a problem through insight — attempted solutions → consistent failure → impasse → restructuring → Aha! → solution — can be called the insight sequence. (Weisberg, 2015, p. 10, emphasis in the original.)*

Ohlsson (2011) ascribes insight even disruptive qualities, within his deep-learning (neogestalt) theory. Weisberg (2015) expresses it as "in all those situations, we must override the past in order to produce something new" (Weisberg, 2015, p. 13).

Taken together, when looking at the different theories of insight in problem solving there are mostly the same components mentioned: a longer phase of lack of progress/frustration, the use of new/unused information and its novel integration within existing knowledge, which leads to a new perspective or focus. Hence, an abandoning of old perspectives happens, and a restructuring of the situation/problem through an integration and complementing of existing and novel information.

#### 3.3.4.2. Insight in Psychotherapy

When looking into psychotherapy, the common understanding of insight differs not much from the one used in problem solving. Connolly Gibbons et al. (2007) conclude that "Patients, through various techniques, come to understand something new about themselves" (Connolly Gibbons et al., 2007, p. 144). A new perspective is taken, a *new insight* is created. Hill et al. (2007) mention the aspect of integrating existing and novel information: "Hence, most of us agreed that we could define insight as a conscious meaning shift involving new connections (i.e., 'this relates to that' or some sense of causality)" (Hill et al., 2007, p. 442).

The authors further characterize the process of insight. An emotional arousal (e.g. through activation of schemata), as well as engaging with painful material (e.g. memories, stories) are needed throughout the process. The parallelism to the frustrating, but yet engaged process of ongoing insight in problem solving can be seen here.

Although insight is a component of almost every psychotherapeutic approach, only little research has been conducted (Connolly Gibbons et al., 2007; Jennissen et al., 2018). It lacks a clear and common definition of insight and consistent vocabulary. Different words are currently used for insight-like processes: self-understanding, psychological mindedness, recognition of psychological difficulties, awareness and understanding of one's own behavioral patterns and motivations (Connolly Gibbons et al., 2007; Fisher et al., 2020; Jennissen et al., 2018; Johansson et al., 2010).

#### *3.3.4.2.1. Clarification Perspective by Grawe*

In Grawe's concept of psychological therapy, the process of insight plays a key role. One of the working-mechanisms of psychotherapy he proposed was the *Clarification Perspective*. The aim of this process is to clarify the patient's 'real' intentions in order to foster a better satisfaction of needs. Through guiding attention to the very moment, a focusing on the experience of the current emotions, feelings, sensations, thoughts, etc. is aimed for. The immediate experiencing fosters an emotional participation and a process of the *explication* of the own feelings. This should take place "not in an intellectual-rational fashion, but rather in a way where he [the patient] identifies with his intentions. This is apparent in that he experiences the appropriate feelings belonging to those intentions" (Grawe, 2004b, p. 66).

This explication of the own feelings is supposed to lead to a restructuring of the situation, an improved building of intentions and the creation of new perspectives or clarity, which in turn results in more confidence (Grawe, 2004b; Rice et al., 1996). Grawe (2004b) mentions different authors, who describe similar processes like the clarification mechanism: Tausch & Tausch (1971) use the term self-exploration-process, Sachse (1992) calls it explication-process, Gendlin (1961) experiencing-process and Rice et al. (1996) choose the term process-experiential-approach.

Focusing on the experiencing of the *Here and Now* in order to foster the process of explication and clarification aims for an enhanced emotional participation of the client to go beyond a purely rational and educational arguing (Yalom, 2010). Grawe (2004b) mentions in this context the concept of *depth of processing* by Sachse (1992), which assesses the degree of the client's emotional participation. The eight stages of processing-depth suggested by Sachse share similarities with the stages of problem solving and the general definition of insight. Stage six (Personal Meaning) describes the affective arousal and the

exploration of current emotions, motives, and representations within the activated schema. Stage seven (Explication) contains the "essential process aspect of the explication: to the formation of representations. The client is exploring the central question: What makes me feel this way regarding this issue?" (Grawe, 2004b, p. 66).

The last stage, (8, Integration)

> *Refers to processes which emerge after (or already during) the formation of a representation: The client recognizes the interrelatedness among the meaning of this schema and other things he knows about himself; (Grawe, 2004b, p. 66)*

Here, new connections are made, and old beliefs are left behind – very close to the process of insight in problem solving, as well as in psychotherapy, described by Hill et al. (2007). Taken together, the mechanism of clarification by Grawe (2004b) is very central to the process of psychotherapeutic change and contains the process of insight, as defined within our model. Grawe (2004b) even suggests some interventions, which facilitate the work on emotional participation and meaning, e.g. empty chair work.

#### *3.3.4.2.2. Psychodynamic Approaches*

Although Grawe (2004b) already pursues an integrative perspective on insight, the role of the concept in psychodynamic and cognitive-behavioral approaches is reviewed shortly.

In psychodynamic approaches, the focus on the immediate experiencing and the development of insight is a key component and both an important mechanism and outcome (Messer & McWilliams, 2007). One of the techniques used here is transference (Johansson et al., 2010). Studies showed the relation between transference interpretations and levels of insight (for an overview, see Jennissen et al., 2018; e.g. Johansson et al., 2010).

#### *3.3.4.2.3. CBT: Exposition Treatments*

Insight plays a role in cognitive-behavioral-therapies as well. Especially within the confrontational technique of *exposition,* the activation of specific aversive and usually avoided memories, thoughts or emotions is aimed for in order to shatter existing beliefs/schemata/constructs and allow the development of new perspectives (Margraf & Schneider, 2009b; Wittchen & Hoyer, 2011). The similarity to the already described processes of insight in problem solving and psychotherapy is obvious: through an emotionally loaded disputation with existing and novel emotional experience/information a disruption of old beliefs happens and an integration of old and new schemata results in a new

perspective/quality. The technique of exposition is mostly used in the two areas of trauma-related disorders, as well as anxiety- and obsessive-compulsive-disorders (OCD).

**Trauma.** For trauma-related disorders (e.g. PTSD) confrontational interventions like imaginative exposition therapy (Foa et al., 2014) and imagery rescripting and reprocessing (Schmucker & Köster, 2021) are established treatments. The shared mechanisms are the confrontation with the usually avoided memories and emotions of the traumatic experience and a construction of a coherent narrative through contextualization of the memories on all levels, i.e. connecting emotional, perceptive and cognitive memories to a temporal coherent construct (Ehlers & Clark, 2000; Ehring, 2019). To make this integration happen, an appropriate arousal and emotional participation of the patient is needed - similar to the already described aspects of the process of gaining insight (Ehring, 2019). There are several similar interventions for treating trauma, which share the same insight-based confrontational mechanism (Ehring, 2019).

**Anxiety & OCD.** The perhaps most standard use of exposition therapy is for anxiety disorders and OCD (Margraf & Schneider, 2018a). Exposition is the confrontation with avoided stimuli, e.g. spiders within a specific phobia or open places within agoraphobia, in order to shatter beliefs about the objects/situations and construct new perspectives and new beliefs, which give the patient more behavioral and emotional freedom. This process can be seen as a kind of insight that is made, not through educational/rational arguing, but through direct experiencing and integrating of emotions, thoughts and behavior. A patient might come to the insight of 'I can stand this situation/emotion, although I never thought of its being possible.' (Wittchen & Hoyer, 2011).

#### *3.3.4.2.4. Common Factor*

After insight can be found in several psychotherapeutic approaches, it is no surprise that there is also already the suggestion to include is as a common factor (Wampold et al., 2007). Lambert & Ogles (2004) and Huibers & Cuijpers (2015) list insight under the process/learning-related common factors (Enck & Zipfel, 2019). In a recent meta-analysis regarding insight, including 23 effect sizes, a significant moderate correlation (r = .31) between insight and treatment outcome was found (Jennissen et al., 2018). The robustness of the effect was confirmed through a sensitivity analysis. The occurrence and the effect of insight were unrelated to the used therapeutic approaches (Jennissen et al., 2018; see also McAleavey & Castonguay, 2014). Because of this overarching effect and its robustness, the authors

proposed it as a common factor and suggested two paths of how insight could work: one is through increased self-competence as understanding is a painful and demanding process, and the other is in gaining new solutions and adaptive ways to behave through the process of understanding and making new connections. The same conclusions were made by a qualitative meta-analysis (Timulak & McElvaney, 2013).

#### 3.3.4.3. Integrative Definition of Insight

Taking all the findings and theoretical constructs together, we suggest following integrative definition of the process of insight, as it will also be used further in our model. First, the patient has to be in a state of emotional activation and arousal. Second, a confrontation with aggravating or even painful material has to take place, e.g. cognitions, emotions or memory. This material had to be avoided by the patient prior to the therapy, what led to unpleasant limitations (similar to the long dry and frustrating spell prior to problem solving or psychological stress through avoidance within disorders). Confrontation with unpleasant material is assumed to lead to an abrupt rise of understanding. The so called "aha"-effect in problem solving, insight in psychotherapy and phase transition within the framework of synergetics. This new quality is characterized through a more dense and coherent contextualization of memories, emotions, and cognitions and insights in relations of those. Last, this allows the patients to take new perspectives, a sense of mastery and gives him/her more possible courses of action.

### *3.3.5. Variable S - Success*

| Author/Group | Theory | Reference |
|---|---|---|
| Grawe | success as an indicator for better satisfaction of needs | (Grawe, 2000) |
| Rogers | decreasing incongruence as success | (Rogers, 1957) |
| CBT | treatments for re-introducing success experience and increasing self-efficacy (behavioral activation) | (Margraf & Schneider, 2018b) |

***Table 7:*** *Theoretical concepts related to S.*

The last variable is success (S). It encompasses the feeling of therapeutic progress, confidence in a successful therapy course, and goal attainments (Schöller et al., 2018).

Although psychotherapy should be guided by the process itself, it is equally important to feel the progress of the therapy process and/or the attainment of (smaller) goals. This can be achieved through different interventions, like goal setting or tracking of the process. It is closely related to other variables/parameters of the therapeutic process, such as the therapeutic alliance and motivation. Two hypotheses are introduced, why the feeling of success is an important dimension in the psychotherapeutic work. **Table 7** (p. 94) summarizes the theoretical concepts related to S.

#### 3.3.5.1. Success as an Indicator for the Better Satisfaction of Needs

Based on Grawe's consistency theory, an important core of his *Psychological Therapy*, humans consistently strive for the satisfaction of their psychological needs. He introduces four basic needs: orientation and control, pleasure, attachment and self-enhancement. Those goals are central to building intentions, motivation, and guiding behavior (Grawe, 2000). An insufficient satisfaction of one or more of those needs leads to a state of incongruence and can contribute to the development and/or maintenance of mental disorders (Holtforth et al., 2005). This state of *incongruence* had also been described by Rogers (1957). Because psychopathology goes along with a poor satisfaction of needs, those basic needs are central to psychotherapy. Grawe argues that psychotherapy has to work on a clarification of those needs and the building of proper intentions, as well as implementing those intentions. Hence, goals play an important role in psychotherapy, because they help to guide the direction of the process of implementing intentions. Our subsequent hypothesis here is that the feeling of success is an indicator of an already better satisfaction of needs. This should already elevate the patient's condition, as an "improved need satisfaction is

proposed as a central mechanism to foster symptom reduction and improved well-being" (Holtforth et al., 2005, p. 445).

Similar to the progress towards a goal evokes feelings of happiness (see Lazarus Core Relational Themes Grawe, 2004b, p. 235 Table 2.1; Lazarus, 1991b), the feeling of progress within the therapeutic process should have positive impacts of the patients' emotions, motivation and confidence in the sequel process as well (Michalak & Holtforth, 2006).

#### 3.3.5.2. Success and Mental Disorders: Loss of Goal Attainment in Depression

As already described within the consistency theory by Grawe, mental disorders go along with an impaired satisfaction of needs, which can lead to symptoms. When looking into specific disorder, especially in depression, the impaired intention building, and goal attainment gets obvious. Typical to the disorder is the so-called *paralysis of will* (Beck & Alford, 2009). Depressed individuals often have difficulties in pursuing goals, a lack of motivation and, with that, a loss of positive reinforcement (Fritzsche et al., 2016). One of the most studied interventions for this symptomatology is behavior activating interventions, as used in the CBT (Margraf & Schneider, 2018a).

#### 3.3.5.3. Goals in Psychotherapy: CBT, Self-Efficacy and Personalization

CBT uses goals as useful interventions. Usually, small goals or challenges, adjusted to the symptoms, are implemented within the therapeutic process (Margraf & Schneider, 2018b). This could be a behavior activating task, like going to a restaurant with friends, in the case of a depressed patient. The hypothesized mechanism of action here is that the collaborative preparation of the small-step goal elevates the probability of attaining it and that the final attainment of the goal leads to the feeling of success, an increase in self-efficacy and with that to a positive reinforcement. (Margraf & Schneider, 2009a). The feeling of progress is here a central mechanism and implemented throughout the therapy in the form of small, reachable goals. Grant et al. (2018) conducted a study with 35 schizophrenic patients with an 'analogue'-test of the above-described CBT intervention of goal attainment. They induced the feeling of success with a card-sorting task, as a comparable effect of feelings of success in "larger" CBT-interventions (like behavioral activation). The intervention group showed improved mood and positive self-believes. The authors concluded that the feeling of success generalizes and has the power to change self-believes and mood states. Romanowska & Best (2023) conducted a similar study with schizophrenic patients, comparing

a success-focused group with a failure-focused group and showed, that the experience of failure (as opposite of success) leads to impaired decision making in the patient group and healthy controls. This shows the effect of the feeling of progress (or a lack thereof) on further goal attainment, similar to the proposed lack of reinforcement disorders by CBT (Margraf & Schneider, 2009a). Connecting those results to our variable success, we argue that the feeling of progress, e.g. through the attainment of goals, feeling of success, goes along with an increase in self-efficacy. With that, the variable S is another source for self-efficacy, additionally to techniques of resource activation, as illustrated in the chapter PARAMETER R - BEHAVIORAL RESOURCES (P. 117). Findings by Cropp et al. (2008) support this claim. The authors conducted a study with 95 inpatient adolescents, finding that treatment outcome was related to self-efficacy experience and therapeutic alliance.

Besides the effect of self-efficacy on success-experience, the personalization of treatment goals is equally important to the feeling of progress. A meta-analysis, including 12 studies, found a higher effect size of treatments using personalizes treatment goals, than using standardizes symptom checklists as outcomes (Lindhiem et al., 2016). Most of the studies used the Goal Attainment Scale (Kiresuk & Sherman, 1968) to create personalized treatment goals. According to the authors, the specific characteristic of personalized goals is the focus on the *improvement of the specific needs of the patient*. Putting the spotlight on where patients can experience their progress most increases therapeutic outcomes. This is exactly what is covered with our variable S. Lindhiem et al. (2016) describe the focus on progress as a mechanism of action of those personalized scales similarly: "[the personalized] approach emphasizes tracking patient progress session by session and graphing the patient's progression through treatment" (Lindhiem et al., 2016, p. 173).

Summing up, personalized treatment goals and the personalized assessment of those have a better effect on treatments than using standardized symptom checklists. The superiority of such ideographic measures has been shown also in recent meta-analysis, including over 100 studies, by Lloyd et al. (2019) We would even go a step further and suggest, that not the goal itself is important for the progress, but the process of attainment and with that the feeling of progress, as it is covered with the variable S.

#### 3.3.5.4. Effect of Tracking the Therapeutic Process

This assumption is supported by the findings regarding the effects of tracking the therapeutic process (independent of goal focus). Tracking the therapeutic process in high-frequent manner, i.e. regularly and not just using pre-post measurements, enhances outcomes (Lambert et al., 2018). Important here is especially that the tracked data is included in the therapeutic process, e.g. within therapeutic feedback. One possible mechanism of action here could be the visualized consolidation of progress and an enhanced experience of progress by the review process of this within therapy sessions (Låver et al., 2023). Di Malta et al. (2019) deliver a good theoretical overview, analyzing different effects of progress tracking and feedback in psychotherapy. Including feedback in goal-oriented processes enhances goal attainment, i.e. enhances the probability of feeling of success (Harkin et al., 2016). Di Malta et al. (2019) conclude, based on previous findings, that goals are important in psychotherapy, as patients experience them as helpful, they enhance improvements and lead to more engagement in the therapeutic process. However, the authors also emphasize that, although goals are important, they should be used for giving a direction, and at the same time should stay flexible and adaptable (Feltham et al., 2018; Holtforth et al., 2005; Law, 2018). This, again, is an indicator that the feeling of progress, as covered with S, is more important for the therapeutic process than the goals themselves.

#### 3.3.5.5. Success and the Relation to Different Variables

As already mentioned, the feeling of success is closely related to different other variables of the therapeutic process. First, the therapeutic alliance is important for creating a supporting environment, regarding agreement on goals and fostering goal attainment (Bordin, 1979). Clemence et al. (2005) showed that the so-called *confidence collaboration* (R. Hatcher, 1999; first introduced by Hatcher & Barends, 1996) has a massive effect on treatment outcome. The concept basically describes that the higher the patient's and therapist's perspective match, the more the patient has a feeling of progress and confidence in a successful therapeutic course. Another important variable related to success is motivation. Holtforth et al. (2005) and Kanfer et al. (2012) describe the enhancing relation between motivation and success, as well as the role of the therapeutic relationship. A more deliberate outline of S and its relation to other concepts involved in the therapeutic process is given in the corresponding chapters found in Equation: S - Success (p. 235) .

It is further important to distinguish the variable problem intensity (P) and success further. S captures an essential aspect of psychotherapy that goes beyond mere symptom reduction. While decreasing symptoms is undoubtedly important, research shows that patients often have broader goals for therapy that encompass personal growth and improved functioning in various life domains. As Cuijpers (2020) emphasizes, many clients seek therapy not just to alleviate distress, but to regain abilities or achieve personal aspirations. This highlights the importance of personalized, growth-oriented goals in therapy. Fernández et al. (2023) further emphasize that progress and self-development in psychotherapy involve more than symptom reduction. While medication may effectively reduce symptoms, psychotherapy aims to foster a trajectory of self-development and personal growth. This aligns with humanistic and positive psychology approaches, which view humans as having an inherent capacity for growth and self-actualization. As Rashid (2015) notes, psychopathology can be understood as arising when the individual's capacities for growth, fulfillment and well-being are thwarted by psychological or sociocultural factors. By including the variable S, this model integrates both deficit-focused and resource-oriented approaches to psychotherapy. While the variable P (problem intensity) captures symptom-related distress, S represents the client's experience of progress, goal attainment, and confidence in positive change. This allows the model to account for both the reduction of pathology and the promotion of wellbeing and personal growth. From a neuroscientific perspective, the experience of success and progress in therapy may activate reward-related neural circuits. Botvinick & Braver (2015) describe how reward expectation networks in the brain are involved in motivation and cognitive control (reflected by parameter m). The variable S might tap into these systems, with experiences of therapeutic progress and goal attainment serving as rewards that reinforce positive change.

In summary, including S as a distinct variable allows to capture the growth-oriented, resource-activating aspects of psychotherapy alongside symptom reduction. This provides a more comprehensive view of therapeutic change that aligns with clients' diverse goals and reflects the full scope of what psychotherapy can offer beyond just easing distress. By measuring experiences of success and progress, the model acknowledges psychotherapy as a process of personal development and self-actualization, not merely a treatment for disorders.

## 3.4. The 4 Parameters

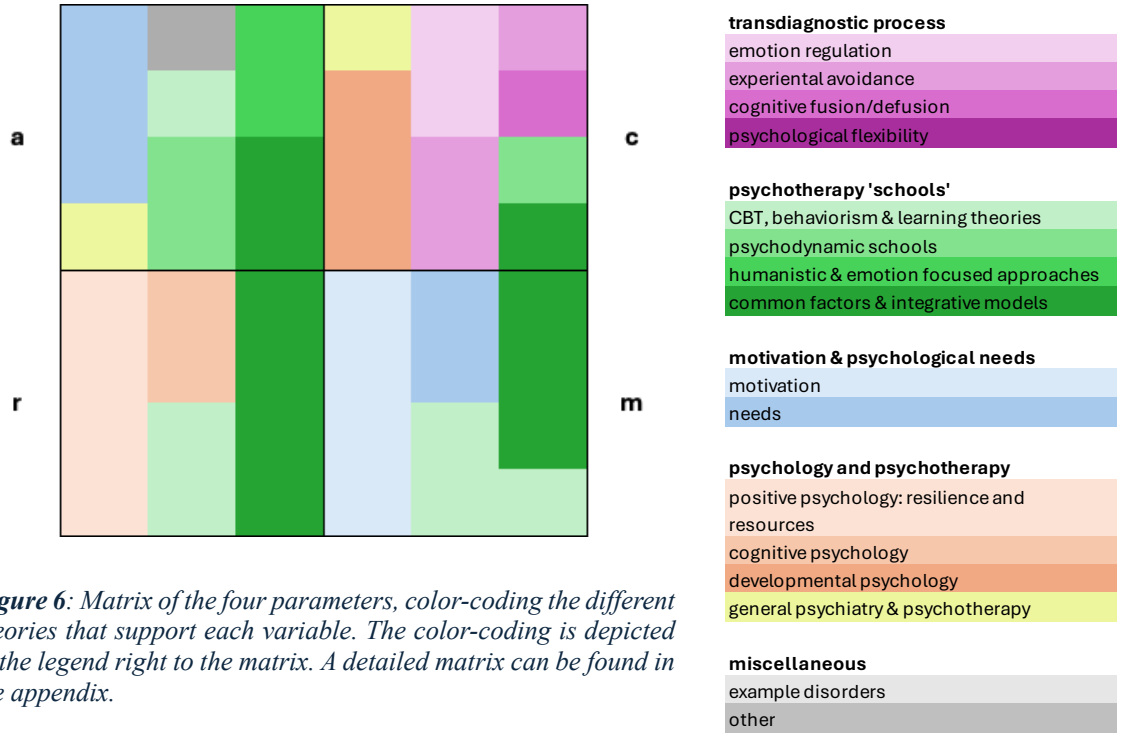



***Figure 6**: Matrix of the four parameters, color-coding the different theories that support each variable. The color-coding is depicted in the legend right to the matrix. A detailed matrix can be found in the appendix.*

Now, after introducing the five variables, a definition and description of the four parameters follows. Each parameter is embedded into the context of psychological theories, research in clinical psychology, and neuropsychological correlates.

**Figure 6** (p. 99) depicts a matrix of the four parameters, color-coded by the different theories that support each variable. In APPENDIX D: MATRIX OF THE PARAMETERS (P. 328) a detailed version of the matrix above can be found, depicting every included theory by name and color-coded.

### 3.4.1. Parameter a - Therapeutic Alliance

| Author/Group | Theory | Reference |
|---|---|---|
| | **attachment as a trait** | |
| attachment as basic need | need to belong | (Baumeister & Leary, 1995) |
| | support and autonomy | (Ryan & Deci, 2008) |
| | need attachment | (Grawe, 2000) |
| Research Domain Criteria | affiliation and attachment dimension | (RDoC, 2024) |
| Big 5 | personality dimension of extraversion/introversion | (Costa & McCrae, 1992) |
| | **attachment and the therapeutic relationship/alliance** | |
| Freud | alliance central to psychoanalysis (transference, countertransference) | (Freud, 1939) |
| Rogers | quality of the relationship (e.g. unconditional positive regard) | (Rogers, 1957) |
| Bordin | pan-theoretical concept of therapeutic alliance | (Bordin, 1979) |
| CBT | alliance as necessary condition for interventions | (Dattilio & Hanna, 2012) |
| psychodynamic therapies | alliance as the framework for therapeutic processes | (Wiseman et al., 2012) |
| Grawe | alliance involved in all working mechanisms | (Grawe, 2000) |
| Common Factors | effects of alliance established factor | (Enck & Zipfel, 2019; Huibers & Cuijpers, 2015; Wampold & Flückiger, 2023) |

***Table 8:*** *Theoretical concepts related to a.*

The first parameter introduced to our model is the therapeutic alliance (a). Alliance is one of the most robust predictors of therapeutic outcome and influential mechanism in the therapeutic process (Norcross & Wampold, 2018). The parameter a differs slightly from the further introduced parameters, because it is a two-fold variable, including two perspectives on alliance in psychotherapy (Zilcha-Mano, 2017): first, it encompasses the therapeutic alliance as a working mechanism, a bond between patient and therapist unfolding over the

course of the therapeutic process. This concept has characteristics of a state-like variable, as the alliance is developing and changing dynamically throughout therapy. Second, the parameter also includes a trait-like perspective on therapeutic alliance as the patient's ability to engage in trustful relationships (attachment disposition), as this influences the building of the therapeutic relationship, as well. The aspects of and arguments for choosing such a two-fold parameter are outlined further. **Table 8** (p. 100) summarizes the theoretical concepts related to a.

#### 3.4.1.1. Attachment: Trait Perspective on Alliance

The first trait-like aspect of alliance is the patient's disposition to engage in trustful relationships. Attachment is seen as a basic psychological need of humans, as we are social animals which depend on our group for survival (Baumeister & Leary, 1995; Grawe, 2000; Ryan & Deci, 2008). Hence, it is present in many psychological theories. The Research Domain Criteria include *affiliation and attachment* as one category of their dimension of social processes. Attachment is defined as a "selective affiliation as a consequence of the development of a social bond" (RDoC, 2024). This overlaps with the personality dimension *extraversion/introversion* of the Big 5. It describes the disposition to engage in, or rather withdraw of social behavior depending on prior experiences (Costa & McCrae, 1992). Grawe (2000) included attachment within his concept of basic needs, embedded in his pantheoretical *psychological therapy*, which are mainly driving the development of human intentions and motivation.

##### *3.4.1.1.1. Attachment Theory & Types*

The most prominent theory about attachment was formulated by Bowlby (1982) and Ainsworth et al. (2015). They argue prior experienced relationships, e.g. to the parents or other loved ones, build specific schemata, which in influence the how relationships are formed in the future. They identified four types of attachment: **secure**, anxious-avoidant (**dismissing**), anxious-resistant (**preoccupied**) and disorganized (**unresolved**). Different methods were developed over time to assess the attachment type, reaching from self-reports to narrative interviews (Bernecker et al., 2014; Diener & Monroe, 2011; Levy et al., 2018). The most famous is the Adult Attachment Interview (AAI) by George et al. (1985), which is based on the four types of attachment identified by Bowlby and Ainsworth. The types are characterized as follows:

> ***Secure*** *individuals are capable of both intimacy and independence. They are comfortable having others rely on them for emotional support and are willing to rely on others. They are confident that they are worthy of love and care.* ***Dismissing*** *individuals value independence, often minimizing the importance of maintaining close relationships and derogating emotions related to caring and intimacy.* ***Preoccupied*** *individuals fear abandonment, rely on others for emotional support, and often struggle to achieve the degree of intimacy they desire, vacillating between feeling "smothered" and neglected. Finally, individuals who appear to dissociate when discussing trauma during the AAI are classified as '****unresolved*** *with respect to trauma' and tend to behave inconsistently in relationships (Main, Kaplan & Cassidy, 1985).(Bernecker et al., 2014, p. 14)*

For the following paragraphs, the distinction between secure and insecure attachment will be made, with insecure attachment including the types dismissing, preoccupied and unresolved, if not further classified.

#### *3.4.1.1.2. Attachment & Disorders*

Before examining the role of attachment in psychotherapy, its relation to mental disorders is shortly outlined to close the gap between those concepts. Growing up in an available, predictable, and sensitive environment is important for developing proper mental functioning and building stable, reliable relationship schemata and competencies. Mikulincer & Shaver (2012) argues, that

> *According to attachment theory, interactions with inconsistent, unreliable, or insensitive attachment figures interfere with the development of a secure, stable mental foundation; reduce resilience in coping with stressful life events; and predispose a person to break down psychologically in times of crisis (3). (Mikulincer & Shaver, 2012, p. 12)*

Hence, attachment security is a link between potential stressful life events and the actual development of a mental disorder. The authors conclude further that "attachment insecurity can therefore be viewed as a **general vulnerability** to mental disorders, with the particular symptomatology depending on genetic, developmental, and environmental factors" (Mikulincer & Shaver, 2012, p. 12).

However, the exact mechanisms of how an insecure attachment style potentially leads to mental disorders seem to be complex and remain unclear. Nevertheless, this general vulnerability has been supported by a vast body of research over the last decades (Bernecker et al., 2014). Not only has insecure attachment been shown as a factor for general vulnerability for psychopathologies (including depression and bipolar disorders), e.g. in a recent meta-analysis (Herstell et al., 2021), also secure attachment has been linked to general better functioning (Pearse et al., 2020). Further is insecure attachment related to personality disorders (Lorenzini & Fonagy, 2013) and the prevalence of insecure attachment style is

higher in individuals with psychosis than compared to non-clinical controls (Carr et al., 2018).

Consequently, the step to link attachment to psychotherapy is not far away. Zilcha-Mano (2021) underlines the importance of the therapeutic alliance for people with problematic attachment styles and personal problems (Falkenström et al., 2013).

#### *3.4.1.1.3. Attachment & Alliance and Therapy*

The first question to ask is if the attachment style influences the building of the therapeutic alliance. Indeed, many studies showed a relation between alliance and attachment style. Diener & Monroe (2011) conducted a meta-analysis, including 17 studies, showing that greater attachment security is associated with a stronger therapeutic alliance; and that greater attachment insecurity is associated with weaker therapeutic alliance. The overall weighted effect size was small, but significant (r = .17). A more recent meta-analysis, including 14 studies that used the same measurement of attachment (Client Attachment to Therapist Scale, with the subscales secure, avoidant and preoccupied), revealed a relation between secure attachment and a stronger working alliance, as well as between an avoidant attachment style and a weaker working alliance. Preoccupied attachment seemed to be unrelated to alliance (Mallinckrodt & Jeong, 2015). The meta-analysis by Bernecker et al. (2014) analyzed even 24 studies, examining the relation between adult attachment style in outpatients and the strength of the patient-rated working alliance. The results showed a significantly small correlation between patient attachment style and working alliance (mean weighted r: attachment avoidance and alliance r = .137, attachment anxiety and alliance r = .121). However, the authors pointed out that there is a general difficulty in investigating the relation between attachment security and alliance in a clinical sample, because patients are generally less secure attached, hence the effect sizes comparing secure to insecure attachment styles might be lower. Zilcha-Mano et al. (2014) tested the effect of pre-treatment attachment on alliance in 149 patients, finding that pre-treatment attachment explained 30-50% of the variance in alliance, depending on the time of measurement.

Summarizing the results on the relation between attachment and alliance, it can be concluded, that the attachment and the development of mental disorders are related, and that the attachment style seems to have a small, but significant influence on the quality of the working alliance in therapy.

#### 3.4.1.2. Working Mechanism: State Perspective on Alliance

However, there is still the second question to be asked, whether the alliance has the possibility to change the attachment style and/or symptoms.

##### *3.4.1.2.1. Alliance: History, Different Usages and Approaches*

The therapeutic alliance, the relationship between patient and therapist, has been used in psychotherapy ever since, regardless of psychotherapeutic approach (Ackerman et al., 2001; McCullough, 2012). In psychoanalysis, working with the alliance has been central since the beginning. In his concept of transference, Freud (1939) described how to make usage of the bond in order to facilitate change processes. Later, the humanistic therapist Rogers (1957) formulated necessary and sufficient conditions for personality change. For of the six conditions are describing the quality of the relationship between therapist and client (e.g. unconditional positive regard, empathy, congruence) - although somehow differently than the psychoanalytic use of the alliance. The first pan-theoretical concept of therapeutic alliance was introduced by Bordin (1979). He condensed the work of Sterba (1934), Zetzel (1956), Menninger (1958) and Greenson (1965), who elaborated the centrality of the therapeutic contact, based on Freud's formulation of transference. Greenson was finally the one who coined the term working alliance (Bernecker et al., 2014; Horvath et al., 2011). Bordin set the focus on the therapeutic alliance with *the ability to work together*. He suggested three aspects, which are consistently negotiated between therapist and patient, which are still used today: the agreement of goals, the agreement on tasks and the bond/mutual trust and understanding. Currently, various terms are used to describe the therapeutic alliance: helping alliance, therapeutic relationship, therapeutic bond or working alliance (Garfield, 1990). We will not focus much here on possible different emphases the terms make and will use them interchangeably. Although the alliance is still important in every psychotherapeutic approach, the usages of it and its assumed contribution to therapeutic change differs: client-centered approaches usually emphasize the therapeutic alliance as a healing mechanism itself (Berdondini et al., 2012). Cognitive-behavioral therapy formulates the alliance as a basis for further interventions like exposition, homework, etc. (Dattilio & Hanna, 2012). Psychoanalytic therapies have a similar perspective on alliance as a necessary base for further processes which take place within the alliance, e.g. insight, exploration of attachment etc. (Wiseman et al., 2012). Grawe (2000) integrated the different perspectives in his *Psychological Therapy* and outlined the usage of the therapeutic

relationship as different aspects of therapy: as a part of process activation (e.g. exploring attachment, using the relationship as a diagnostic tool), a problem perspective (i.e. familiar patterns of attachment re-enact within the therapeutic relationship, similar to the concept of transference) and the resource perspective (e.g. revealing the patient's strengths and abilities, connecting to existing goals and intentions).

#### *3.4.1.2.2. Alliance as Common Factor*

However, besides theoretical explorations, research has investigated all the assumed paths of action of alliance: as a healing factor itself or as a facilitating base for further interventions. Alliance is treated as a working mechanism in the field of the common factors research in psychotherapy (Enck & Zipfel, 2019). It is a central aspect of interaction/process and support factors (Enck & Zipfel, 2019; Fiedler, 1950; Huibers & Cuijpers, 2015; Lambert & Ogles, 2004). There is a vast body of research supporting the central role of alliance in the therapeutic process. A recent meta-analysis, including around 300 studies and over 30.000 patients, by Flückiger et al. (2018) found a robust and significant mid-size correlation between alliance and outcome (r = .278, equals *d* = .579). The study included face to face, as well as internet therapy. The effect did not differ significantly between the two conditions. In an earlier meta-analysis (including 16 studies), Flückiger et al. (2012) also confirmed the association between a stronger alliance and better therapy outcome. They emphasized that the association persisted independently of outcome type, treatment progress, session outcome, or source of measurement. This being an indicator of the robustness of the effect of alliance (see also Martin et al., 2000; Wampold & Flückiger, 2023). Another big meta-analysis by Horvath et al. (2011), including over 200 studies with about 14.000 patient/treatments, revealed as well that a stronger therapeutic reliance was related to better outcomes (r = .275, explained variance of 7.5%). The same authors found, additionally to the general relation between alliance and outcome, that the working alliance was even a better predictor when it was rated by the client him/herself, compared to a therapist- or observer rating of alliance (Horvath & Symonds, 1991, meta-analysis over 24 studies). This underlines the importance of a client-centered approach and assessment in therapy, as it is suggested within the scope of our model. Additionally, a high-frequent assessment of alliance and reviewing the regular feedback by the therapist can improve the alliance and with that the outcome as well (Zilcha-Mano et al., 2016; Zilcha-Mano, 2017). Further, it has been shown that a good therapeutic alliance, with a focus on integrating and respecting

client references, resulted in higher treatment satisfaction, better outcomes and fewer treatment dropouts (Spencer et al., 2019)

Even though the association between alliance and outcome is very robust, a huge part of the studies have the so called 'time-line problem'. Because of their pre-post design, the cause of effect is not quite clear (Kazdin, 2009): a better alliance can lead to a symptom reduction, but a symptom reduction can also lead to a better alliance. However, there is some temporal evidence that a strengthened alliance precedes symptom reduction (Kazdin, 2009). A systematic review showed that alliance is a potential mediator of symptom change, including studies that have design recommended for mechanistic research (Baier et al., 2020). Zilcha-Mano (2017) outlined that there is evidence for both: improvement of alliance as a precursor of symptom reduction, as well as an improved alliance after symptom reduction. Wampold & Flückiger (2023) conclude, that cause of effect is not linear, and "that the alliance is not simply a consequence of symptom improvement, but suggest that symptom improvement and alliance work synergistically" (Wampold & Flückiger, 2023, p. 29).

This is picked up in the two-component model proposed by Zilcha-Mano (2017). She suggests that alliance is a two-fold variable with an interaction of trait and state like components. Trait-alliance (attachment disposition) is supposed to influence the general ability of building an alliance, which might be framed as marking as the scale of the 'maximal possible alliance'. Within her model, state-like changes are assumed to predict symptom changes. No assumptions were made about the interaction of how state-like changes might influence trait-like dispositions. Additionally, to the state-trait-interaction, the interaction of therapist- and patient-perspective on alliance is stressed, suggesting that future studies need to include alliance ratings of both (Zilcha-Mano et al., 2016; Zilcha-Mano, 2017).

In summary, findings suggest that both pre-treatment attachment (i.e. trait like alliance) and the state-like alliance are important factors in the psychotherapeutic process, which can facilitate it. However, there is a tight and dynamic interaction between the state- and trait-like components within the patient and within the alliance dyad with the therapist, which is very hard, maybe even impossible, to detangle clearly (Zilcha-Mano, 2017). Therefore, it is reasonable to include state- and trait-like components within one variable, as it is done in our model. The question in mind has always to be, if the findings could improve treatment. Because of the deep interconnectedness of state and trait alliance, they will probably

never be separately treatable constructs. Hence, we argue, that it is more important and effective for the treatment to assess alliance-related changes with a high frequency throughout the therapeutic process and react to it sensitively with the help of feedback systems, e.g. SNS, than to focus on the detangling the deeply interconnected components. Results underline the importance of such a high-frequent assessment of both - attachment and alliance, especially of the patient's perspective and optimally of the patient's and therapist's perspective. Besides the assessment, of course, including the feedback as a matter of routine within therapy, to better align patient- and therapists-perspective and strengthen the alliance further.

#### 3.4.1.3. Neurological Correlates of Alliance

Faustino (2022) formulates fourteen principles based on neuropsychological findings, which are aimed at explaining and fortifying psychotherapeutic outcomes. The third principle deals with alliance, using the connection between attachment and bonding. Attachment is believed to facilitate neural change, as hypothesized. The authors provide an excellent overview of which neuropsychological changes are initiated following a bonding process: secure attachment experiences activate gene expression through epigenetics, influencing brain structures and neural networks. This process affects several neurobiological mechanisms. It stimulates the brain-derived neurotrophic factor (BDNF), promoting neural growth and plasticity, modulates the hypothalamic-pituitary-adrenal (HPA) axis, and increases dopamine projections in the medial prefrontal cortex. Additionally, attachment regulates oxytocin levels associated with care behaviors, and activates mirror neurons, which are important for relational learning. Conversely, early maternal deprivation can reduce BDNF and NMDA receptors, potentially leading to poor memory and learning (Faustino, 2022).

As already written in this chapter, the therapeutic relationship plays a similar role to the bond with close caregivers from a developmental psychology perspective. This means that the positive neuropsychological changes that are triggered in the child's bonding process could also be triggered in a therapeutic relationship. Thus, the bonding-related neuropsychological changes could also be initiated by the therapeutic relationship. There is already some evidence in the field of epigenetics showing altered epigenetic mechanisms after psychotherapeutic interventions (Penadés et al., 2020; Quevedo et al., 2022; Schiele et al., 2020). However, it remains unclear whether the therapeutic alliance is the central

mechanism of change here. Although, the stress response seems to play a crucial role in the epigenetic processes. A good therapeutic alliance can help to reduce stress by fostering the feeling of secure attachment, similar to the 'secure base', which allows a child to explore as postulated by Bowlby (1988).

These findings underline the importance of the therapeutic alliance in psychotherapy. A model describing the psychotherapeutic process must include alliance, as it is the most researched and evidenced impacting factor of psychotherapy process and outcome.

### *3.4.2. Parameter c - Cognitive Competencies*

| Author/Group | Theory | Reference |
|---|---|---|
| developmental theories | development of cognitive competencies in children similar to the psychotherapeutic process | (Sun & Hui, 2012) |
| Piaget | cognitive competence as process of assimilation | (Piaget, 2010) |
| | scaffolding | (Vygotskiĭ, 1962) |
| OPD | personal structural maturation and development | (Cierpka et al., 2014) |
| ICD-11 | personality assessment | (Blüml & Doering, 2021) |
| Gross | emotion regulation | (Gross, 2015) |
| Bateman & Fonagy | mentalization | (Bateman et al., 2019) |
| | metacognition | (Fonagy & Bateman, 2016) |
| | self-reflection | (Dimaggio et al., 2009) |
| Kabat-Zinn | mindfulness | (Kabat-Zinn, 2015) |
| Common Factors | cognitive dimension as important change factor | (Huibers & Cuijpers, 2015) |

***Table 9:*** *Theoretical concepts related to c.*

The parameter *cognitive competencies* (c) includes capacities of emotion regulation and mentalization, as well as capabilities of self-reflection and the level of the personality structure (according to the Operationalized Psychodynamic Diagnostics, OPD). **Table 9** (p. 108) summarizes the theoretical concepts related to c.

#### 3.4.2.1. Definition of Cognitive Competencies

The current literature hardly contains such broad definitions and usually focuses on one of the above included concepts. But when looking back to the big thinkers/intellectual leaders in the last century, their definitions are close to our understanding of cognitive competencies. As nicely summarized by Sun & Hui (2012) Piaget described the concept:

> *cognitive competence constitutes the cyclical processes of assimilation and accommodation, which indicates that people can manipulate their personal experiences as well as organize and adapt their thoughts to guide their behavior. (Sun & Hui, 2012, p. 1)*

Piaget delineates an important feature of cognitive competencies here: the ability to influence one's internal landscape, such as emotions and thoughts, and the controlling effect on behavior. We will evolve these relations and the important role of c further in the corresponding functions.

#### 3.4.2.2. Parallelism to Developmental Theories

The parallelism between cognitive competencies in mental disorders and the development of cognitive competencies discussed in the developmental theories of psychology is interesting. Developmental psychologists such as Jean Piaget and Lev Vygotsky describe different stages and paths of capability acquisition which have massive similarities to cognitive competencies in mental disorders (see Sun & Hui, 2012 for an overview; Piaget, 2010; Vygotskiĭ, 1962; Vygotskiĭ & Cole, 1978). For example, the concept of scaffolding and importance of social interaction, summarized again by Sun & Hui (2012):

> *Meaningful social interaction is another factor helping adolescents excel cognitively.*
> *Vygotsky [4, 5] believed that through conversation, collaboration, modeling, guidance and encouragement, adolescents learn better ways of thinking, reasoning and solving problems from more competent peers and adults, when compared with performing the task alone. (Sun & Hui, 2012, p. 3)*

Studies even showed that cognitively advanced students were characterized by better self-regulation and the ability to transfer the learned skills (Dewey & Bento, 2009; Sun & Hui, 2012). The suggested interventions and settings for an optimal development of cognitive competencies remind of psychotherapeutic interactions, as Rogers (1957) suggested it.

#### 3.4.2.3. Roots in Psychoanalytic Therapies

This parallel to the developmental theories had already been made by Freud (1900) and is still an important brick in psychodynamic therapies (Inderbitzin & Levy, 2000; Moore et al., 1990; Rudolf et al., 2013). Two concepts are basically distinguished: regression and level of personality structure. The former refers more to a situational context, whereas the latter describes the general development of the personality.

Regression is defined as the

> *the return to a more developmentally immature level of mental functioning. The concept is intimately related to the hypothesis that in the course of psychological development an individual passes through a series of phases, each with specific instinctual, ego, ego-ideal, and superego characteristics. (Moore et al., 1990, p. 164)*

The level of personality structure describes the availability of psychological functions, which are necessary for the organization of the self and its relationships to inner and outer objects (Rudolf et al., 2013, p. 54).

The OPD was developed as a comprehensive diagnostic system and contains different axes/scales (Blüml & Doering, 2021; Cierpka et al., 2014; Rudolf et al., 2013). The axes are also described as dimensions of personal-structural maturation and development (Fiedler, 2012). The dimensions cover the levels of cognition, regulation, emotion and attachment (Rudolf et al., 2013), each further differentiated with a focus on the self and the external world (objects). Different well-known concepts can be found in the subscales. Examples here are self-reflection (cognitive dimension → self-perception), control of impulses and affect regulation (regulative dimension → self), and ability for empathy corresponds with the concept of mentalization (emotional dimension → external) (Cierpka et al., 2014; for a more detailed overview, see Rudolf et al., 2013).

Similar dimensions of personality functioning covered by the OPD can also be found in the new dimensions for personality assessment of ICD-11, the DSM-5 and the Psychodynamic Diagnostic Manual developed by Kernberg (PDM-2), which is more popular than the OPD in non-German-speaking countries (see Blüml & Doering, 2021 for a detailed comparison; Bach et al., 2017).

Some of the presented diagnostic systems include more dimensions, going further than our variable of cognitive competencies. Especially the attachment related scale of OPD has similarities to the parameter a *therapeutic relationship* in our model (Rudolf et al., 2013).

However, summed up the abilities described in several subscales of the OPD integrate very well into the variable of cognitive competencies, as both centrally contain abilities for self-regulation.

#### 3.4.2.4. Newer Concepts of Psychology Related to Cognitive Competencies

But let us look at the previously mentioned concepts of emotion regulation, mentalization and self-reflection to further amend the parameter cognitive competencies with more recent ideas of psychology theory.

##### *3.4.2.4.1. Emotion Regulation*

Emotion Regulation is a concept, established in the 90s and gaining massive attention in research with the turn of the millennium, but is probably as old as mankind (Gross, 2015).

According to Gross (2015) emotion regulation is, together with mood regulation and coping, a part of the umbrella term affect regulation. Emotion regulation itself "refers to processes that influence which emotions we have, when we have them, and how we experience or express these emotions" (Gross, 1998; Gross et al., 2011, p. 767). It can be distinguished from the other terms of the affect-umbrella through its cognitive and motivational involvement: "The defining feature of emotion regulation is the activation of a goal to influence the emotion trajectory" (Gross, 2015, p. 5).

So, although regulating emotions is not always conscious (Gross, 2015), it implicates an ability to assess and alter own states in order to align it with own goals.

> *Sometimes this goal is itself the desired end point—for example, I may regulate my sadness in order to feel less sad. At other times, however, an emotion regulation goal is merely a means for achieving some other valued end—for example, I may be motivated to look more interested in a conversation than I really am in order to get a job. (Gross, 2015, p. 5)*

Based on the definition above of the control parameter c, the ability to directly manipulate the own inner experience is a core feature of cognitive competencies.

##### *3.4.2.4.2. Emotion Regulation and Attachment*

A connection to developmental theories can be made here as well: the origins of emotion regulation are also hypothesized to lie in the infant-parent/attachment figure relationship (Bowlby, 1988; Mikulincer & Shaver, 2019). The attachment theory itself even has been frequently classified as an emotion regulation theory (Malik et al., 2015). The adult helps

the infant to regulate its emotions in the beginning (external emotion regulation), and the child starts through that help to develop abilities of own emotion regulation (Bowlby, 1988; Gross, 2015; Mikulincer & Shaver, 2019). If the caretaker is not available, responsive and supportive, an insecure attachment style will develop. This includes, for example, distrust in others, worries about others' reliability, and often is accompanied by a more frequent activation and also suppression of negative emotions (Mikulincer & Shaver, 2019).

Popular paradigms for assessing the relation between attachment and emotion regulation (i.e. attachment style) on the level of infants are the Still-Face Paradigm (Tronick et al., 1978) and the Strange Situation (Ainsworth et al., 2015). The Adult Attachment Interview (George et al., 1985) is a tool for identifying the attachment styles in adults.

However, also in adults attachment and emotion regulation are still deeply interconnected. Attachment styles, developed in childhood and adolescence, have been shown to influence emotion regulation in adulthood (Malik et al., 2015; Mikulincer & Shaver, 2019). Adults with better attachment have better emotion regulation and apply better emotion regulation strategies (Mikulincer & Shaver, 2016; Mikulincer & Shaver, 2019). Moreover, impaired attachment is hypothesized as a risk factor for emotional problems and psychopathologies (Cassidy & Shaver, 2016; Mikulincer & Shaver, 2016; Mikulincer & Shaver, 2019). Moreover, emotion regulation seems to be a mediator between attachment and depression in adults (Malik et al., 2015).

It is reasonable to include the concept of emotion regulation in variable of cognitive competencies. On the one hand, ER contains important characteristics that are useful for the variable of cognitive competencies. On the other hand, our model aims to deliver a more general framework for psychotherapy assessment, and emotion regulation is an established and well-known concept that plays an important role in mental disorders (Aldao et al., 2010; Dryman & Heimberg, 2018). It is suggested as a trans-diagnostic factor (Cludius et al., 2020). E.g. emotion regulation can be impaired by a dysfunctional selection of emotion regulations strategies or a lack of ability of application.

#### *3.4.2.4.3. Mentalization*

But besides regulating the own emotions, another important factor in navigating through a social life is the ability to assess mental states of oneself and others, which is called mentalization (Bateman et al., 2019). More precise: "Mentalizing is defined as the capacity to

understand other people's intentional or inner mental states while taking into account one's own intentional states" (Lüdemann et al., 2021, p. 1).

Mentalization is, similar to emotion regulation, a capability developed in the early infant-caregiver relationship, hence closely connected to attachment as well (Fischer-Kern & Tmej, 2019). Through contingent and playful interaction with the caregiver, the child begins to develop a sense of intentionality. Over a few further stages of development, the different modes of functioning become finally integrated and build the ability of mentalization (see Fischer-Kern & Tmej, 2019 for a detailed explanation of the stages of development). Hence, a child acquires the ability to reflect its own mental states and make hypothesis why other behave in specific ways - a key competency to understand and navigate the world (Fonagy et al., 1991). The concept of theory of mind is related to the acquisition process of mentalization (Fischer-Kern & Tmej, 2019; Fonagy et al., 1991). However, mentalization itself includes further aspects than the theory of mind does (Choi-Kain & Gunderson, 2008; Fischer-Kern & Tmej, 2019).

Mentalization enfolds over three different dimensions:

> *The first related to two modes of functioning (i.e., implicit and explicit), the second related to two objects (i.e., self and other), and the third related to two aspects (i.e., cognitive and affective) of both the content and process of mentalizing. (Choi-Kain & Gunderson, 2008, p. 2)*

Based on the definitions, we can see mentalization as an intrapsychic organizational skill, which allows to arrange/organize the inner mental states (images, thoughts, desires, beliefs…) (Bateman & Fonagy, 2004; Choi-Kain & Gunderson, 2008). Going back to our definition of cognitive competencies as the ability to influence one's internal landscape, mentalization can be seen as part of the parameter c.

#### *3.4.2.4.4. Mentalization and Mental Disorders*

Initially, mentalization was introduced as a concept for treating and explaining deficits in the borderline personality disorder (Bateman et al., 2019; Bateman & Fonagy, 2004; Fonagy & Bateman, 2006). However, with a wider application of the mentalization based treatment (MBT), research showed impaired mentalization as a risk factor, as an impaired ability and as a factor in psychotherapy (Lüdemann et al., 2021) in many mental disorders besides borderline personality disorder, such as anxiety disorder, obsessive-compulsive disorders (Sloover et al., 2022), posttraumatic stress disorders in children and adults (Oehlman Forbes et al., 2021; Sloover et al., 2022; Stevens & Jovanovic, 2019), depression (Fischer-

Kern & Tmej, 2019; Luyten & Fonagy, 2018) and eating disorders (Luyten et al., 2020; Robinson et al., 2019).

#### *3.4.2.4.5. Self-Reflection*

Another concept falling into the dimension of cognitive competencies is self-reflection. Self-reflection is defined as:

> *The abilities of individual persons to think about who they are as unique human beings. It allows persons to ask and respond to questions which range from 'who am I,' to 'why did I say or do that?' We refer here to higher order conscious processes involving ability to detect aspects of the self, such as emotional experience, and to describe them in words the addressee can understand. Self-reflection also involves the ability to reason about aspects of the self interacting with the world, such as grasping plausible eliciting factors for the emotion one is experiencing or taking a critical distance for one's own ideas about an event understanding it is a subjective construction and not a truth-like description of the external world. (Dimaggio et al., 2009, p. 653)*

The conceptualization of self-reflection shows similarities to the concepts of mindfulness (component of self-awareness), mentalization (component of understanding/making sense of the own mental states), and metacognition (component of the ability of distancing of own thoughts). As already mentioned in the definition, all of those concepts conglomerate under the term of higher-cognition processes (see Newer Concepts of Psychology Related to Cognitive Competencies (p. 111) for a more detailed explanation) (Fonagy & Bateman, 2016; Lysaker et al., 2013). Self-reflection seems also to be impaired in several mental disorders (Dimaggio et al., 2009; Philippi & Koenigs, 2014; van der Meer et al., 2010).

#### *3.4.2.4.6. Neurological Underpinnings and Similarities of the Concepts*

When now looking at the concepts included in our definition of cognitive competencies, the areas of emotion regulation (Berking & Wupperman, 2012; Cludius et al., 2020), mentalization (Lüdemann et al., 2021) as well as self-reflection (Dimaggio et al., 2009) share that they are either impaired, momentary, not accessible, or not sufficiently developed in mental disorders.

Although the concepts of emotion regulation and mentalization are conceptually close, only a few studies investigated the connection directly (Luyten et al., 2020; Schwarzer et al., 2021). Borelli et al. (2018) found a reduced emotional stress response in children with increased mentalizing capacity. The stress response was measured with the cardiovascular reactivity, which can be seen as a measure for emotion regulation capacities in a wider sense (Schwarzer et al., 2021).

But similarity of the concepts is not only on a theoretical level - as all are a part of the capability to regulate internal states - also on a neuropsychological level, the concepts overlap in some neural circuits (Schwarzer et al., 2021). In emotion regulation is the frontoparietal network involved, with the dorsolateral, ventromedial prefrontal cortices and the anterior cingulate cortex affecting in a top-down regulating way the limbic structures, the insula and amygdalae (Etkin et al., 2015; Guendelman et al., 2017; Schöller et al., 2018). Similar structures are activated during the processes of internal and external mentalization (see Luyten & Fonagy, 2015 for a detailed overview; Arioli et al., 2021; Luyten et al., 2020; Luyten & Fonagy, 2018; Mahy et al., 2014). The dimension of controlled mentalization is associated with neural circuits in the prefrontal cortex (lateral, medial), which are also involved in explicit emotion regulation (dorso- and ventrolateral PFC) (Guendelman et al., 2017; Luyten & Fonagy, 2015). Furthermore, the prefrontal cortex (especially ventro-medial area) is involved in implicit emotion regulation and cognitive-affective mentalization (Guendelman et al., 2017; Luyten & Fonagy, 2015).

Even though there is an overlap in neural circuits in both concepts, they do not share the same networks 1:1. An explanation could be that mentalization can be divided in the dimension of self- and other (Choi-Kain & Gunderson, 2008). The overlap to the concept of emotion regulation might be more by self-mentalization, similar to mindfulness. Which is ought to share more with mentalization on the self-dimension, according to Choi-Kain & Gunderson (2008). This could explain the partial (and not fully) overlap of the neurological structures involved in mentalization and emotion regulation. Although they both share some kind of mental capacities, both are still distinct concepts. Albeit or therefore we are including both of them in our dimension of cognitive competencies.

#### *3.4.2.4.7. Further Concepts Related to c: Mindfulness & Metacognition*

Interestingly, both concepts - mentalization and emotion regulation - overlap theoretically and neurologically with the concept of mindfulness (Choi-Kain & Gunderson, 2008; Guendelman et al., 2017; Luyten et al., 2020). Mindfulness has been shown to improve emotion regulation (Gross, 2015) and also shows activation of similar neural circuits (Guendelman et al., 2017). At the same time mindfulness is overlapping with the cognitive-affective aspects of self-mentalization (Choi-Kain & Gunderson, 2008), and the involved neural circuits are like the ones involved in mentalization (listed above) (Guendelman et al., 2017; Luyten & Fonagy, 2015). Mindfulness, defined as the nonjudgmental, nonelaborative

awareness of the present-moment experience (Kabat-Zinn, 2005), includes two dimensions: attention regulation and the acceptance and openness to experience (Bishop et al., 2004). Both facets of the concepts fit in the aspects of cognitive competencies, as both describe the ability to alter inner states. Hence, mindfulness could be argued to be included in the parameter c as well. However, the concept of mindfulness includes body-related aspects (the experience of *body* and mind (Bishop et al., 2004)), which are not included in the parameter c, but would fit into a body- and awareness-related variable, discussed in the chapter Possible Variables based on Factor Analysis (p. 255) .

Another concept, which is related to mentalization and is a debatable concept for parameter c is metacognition. Metacognition is, similar to mentalization, conceptualized as a trans-diagnostic factor (Luyten et al., 2020; Malda-Castillo et al., 2019; Sloover et al., 2022) Both concepts, together with mindfulness, reflective functioning and social cognition, are considered as higher-cognition processes (Fonagy & Bateman, 2016). According to Fonagy & Bateman (2016)

> *The core distinguishing feature of these hypothetical constructs is that they relate to brain structure as a hierarchy of layers of abstraction and assume a top-down influence on lower orders of this neural pyramid. (Fonagy & Bateman, 2016, p. 59)*

Kongerslev et al. (2015) discuss the similarities and overlap of those concepts and their attribution to clinical practice. All of those different concepts already found application in clinical practice in form of different therapies: e.g. mindfulness in the Mindfulness-Based-Therapy, mentalization in the Mentalization-Based-Treatment (MBT) and emotion regulation is a basic module in classical cognitive-behavioral therapy.

Taken together, all the different outlined concepts share a similar base - the manipulation of internal mental states. Parts of the constructs, such as mentalization and emotion regulation, are already assumed to be trans-diagnostic factors. Therefore, it is reasonable to include those overlapping constructs in the comprehensive dimension of cognitive competencies, represented by the variable c in our model.

#### 3.4.2.5. Cognitive Competencies as Common Factor in Psychotherapy

Last, the field of common factors research also reveals the dimension of cognitive aspects as an important dimension in the therapeutic process. In a synthesis of common factors, Enck & Zipfel (2019) list a cognitive dimension as an important change factor in

psychotherapy, including aspects like rationality and the ability to identify and change expectations (see also Huibers & Cuijpers, 2015; Lambert & Ogles, 2004). The cognitive system described in the Research Domain Criteria also has some similarities with parameter c. Further, the generic model of psychotherapy by Orlinsky (2009) has a similar factor included, called self-relatedness:

> *The reflexive aspect of the individual's experience while engaging in activities and relationships, an aspect that is recognized more clearly in terms such as self-awareness, self-control, and self-esteem. […] The participants' states of self-relatedness constitute an integral part of the treatment process and may have an impact on other aspects of process and outcome, for example, on their receptivity to one another, or on their ability to assimilate what is happening during sessions. (Orlinsky et al., 2004, p. 319)*

This self-relatedness contains many aspects already included in the parameter c, like self-reflection, mentalization and emotion regulation. The mechanism of intention realization, formulated by Grawe (2004b) needs competencies that match with the concepts included in parameter c. Several other integrative frameworks mention cognitive competencies, that are similar to the parameter c in our model: Hayes, Hofmann, & Ciarrochi (2020) include the dimension of cognition, Mischel & Shoda (1995) self-regulatory plans and competencies, Antichi & Giannini (2023) mentalization, affective awareness and emotion regulation and Lutz et al. (2019) emotion- and self-regulation within the Trier Treatment Navigator.

Taken together, the parameter c describes important abilities relevant for psychotherapeutic change. Many of them are established concepts on their own and identified as an important mechanism in the therapeutic process.

### *3.4.3. Parameter r - Behavioral Resources*

| Author/Group | Theory | Reference |
|---|---|---|
| problem solving | problem solving as balance of internal (resources) and external demands | (Heppner et al., 2004) |
| resource perspective | anything that helps patients and promotes self-healing powers | (Schiepek & Matschi, 2013) |
| | solution-focused brief therapy | (De Shazer & Dolan, 2008) |
| | salutogenesis concepts | (Antonovsky, 1987) |

| Author/Group | Theory | Reference |
|---|---|---|
| Grawe | mechanism resource activation | (Grawe, 2000) |
| Common Factors | activation and learning of behavioral competencies | (Lambert & Ogles, 2004) |
| CBT | interventions enhancing and activating behavioral resources (problem solving training, behavioral analysis, role-plays, etc.) | (Margraf & Schneider, 2018b) |

***Table 10:*** *Theoretical concepts related to r.*

The parameter r refers to behavioral resources and competencies involved in problem solving, as well as different resources and skills (e.g. social skills), which facilitate the transformation and application of insights into action (Schiepek et al., 2017; Schöller et al., 2018). **Table 10** (p. 118) summarizes the theoretical concepts related to r.

#### 3.4.3.1. Small Excursus: Behavioral Resources in Research and Practice

When researching behavioral resources, you discover a typical problem in the field of psychology and psychotherapy: the gap between psychology research and psychotherapy practice. Behavioral resources are a common term in psychotherapy practice. It is a usual procedure in psychotherapy to assess which kind of functional and dysfunctional behavior a patient has and how to modify them (Flückiger & Wüsten, 2021; Gruber, 2020; Wittchen & Hoyer, 2011). But when researching the term behavioral resources in academic databases, predominantly search results of the fields of economic and organizational psychology pop up, which refer to behavioral resources as skills needed in different jobs. The quite wide term of behavioral resources seems not to be established in psychotherapy research, to our knowledge. A more investigated term is behavioral modification, but most literature here was published before 2000 or is in the form of practice-research gapping books. The close connection to scientific papers and experiments can be made with the terms problem solving (see D'Zurilla & Goldfried, 1971 for the connection to behavior modification), coping (Lazarus, 1966) and resources in general (Grawe, 2000; Schiepek & Matschi, 2013).

Therefore, we complement the parameter r (as well as the complete model) with terms used for psychotherapeutic practice and mostly more specific psychological constructs, like problem solving, coping and resources.

#### 3.4.3.2. Problem Solving Research

One part of the behavioral resources is problem solving. It can be defined as a "cognitive-behavioral process by which a person attempts to identify or discover effective or adaptive solutions to stressful problems encountered during the course of everyday living" (Nezu, 2004, p. 3).

The connection to the parameter c is already visible here in the definition. It will be further examined in the chapter FUNCTION OF R - BEHAVIORAL RESOURCES (P. 244). Heppner et al. (2004) give a detailed overview of the history and concepts of problem solving. Two basic components were developed, which contribute to problem solving: the ability itself and the application of it, which is i.a. influenced by metacognition about and appraisal of the own skill. Around those components different, but complementary, problem-solving theories have emerged. The first relates to the person-environment interaction and is mostly known under the term coping (Lazarus, 1966). It conceptualizes problem solving as a balance of external and internal demands (resources, i.a. skills), which decides whether a person perceives stress (Heppner et al., 2004) (demands > resources = stress). The second theories can be summarized under generalized expectancies and refer mostly to the appraisal part of problem solving. They root in social learning theories (Bandura, 1986; Heppner et al., 2004) and assume that the appraisal of the own skill is an important factor in the ability of problem solving (Heppner et al., 2004; Nezu, 2004; see D'Zurilla & Goldfried, 1971 for the social problem-solving theory). The appraisal theories are more connected to our parameter c and their relation is picked up in the chapter FUNCTION OF R - BEHAVIORAL RESOURCES (P. 244), where the influence of c on r is examined.

The parameter r mostly contains the skill-related part of problem solving as formulated in the person-environment focused theories.

#### 3.4.3.3. Problem Solving & Mental Disorders

So, when problem solving describes the capabilities to organize and execute behavior regarding a goal orientation (Bandura, 1986; Heppner et al., 2004), an impaired ability of problem solving should cause more stress (demands > resources = stress) or generally reduced well-being. This is also what Heppner et al. (2004) describe:

> *As Durlak (1983) has noted, it is easy to accept the usefulness of effective problem-solving skills; it makes intuitive sense that "good problem solvers … are flexible and adaptable in different social circumstances, able to deal effectively*

> *with stress, and able to develop suitable methods to attain personal goals and satisfy their needs" (p. 31). Conversely, ineffective problem solvers are less able to adequately respond to problems and deal less effectively with their environment. (Heppner et al., 2004, p. 361)*

Heppner et al. (2004) characterize this ability to adjust to the environment on a behavioral level as *psychological adjustment*. Having different problem-solving skills gives you more freedom and options to master difficult situations and external demands. The behavioral flexibility that comes with those capabilities reminds of the concept of psychological flexibility by Kashdan & Rottenberg (2010), which has been shown and already outlined in this work as an important factor for mental health.

The relation between problem solving and mental health has also been /widely researched/. Many studies have shown a strong correlation between problem solving and stress responses, i.e. better problem solving relates to a decreased stress response (for a comprehensive review see Heppner et al., 2004). Also, increases in psychological health were related to more positive problem-solving appraisal (Aburezeq & Kasik, 2021a; Heppner et al., 2004) Further correlates decreased problem solving efficacy with higher levels of depression. This effect has been shown across different cultures and ages (Heppner et al., 2004), as well as across different disorders besides depression (anxiety, alcohol abuse, eating disorders, physical impairments) (Aburezeq & Kasik, 2021a; Heppner et al., 2004; Nezu, 2004). Besides correlational results, problem solving seems to be a moderator between stress and depression (Heppner et al., 2004), and enhanced problem solving is a predictor for better recovery from depression (Dixon, 2000). However, the relation is, as always, bidirectional. Depression also seems to cause temporal deficits in problem solving (Dixon et al., 1993; Nezu, 2004).

Besides mental health, problem solving is also related to behavioral problems. The review by Merrill et al. (2017) about problem solving in adolescents, analyzing literature from 1993 to 2015, found a correlation between social problem-solving skills and behavioral problems, i.e. better skills are related to fewer problems. They also found a positive effect of problem-solving training on behavioral outcomes. This suggests that problem solving can be trained and has a causal effect on behavior, i.e. better problem-solving results in less problematic behavior.

This assumption is nothing new in cognitive-behavioral therapy (CBT). A key assumption here is that changing dysfunctional behavior leads to better well-being or decreased symptoms (Margraf & Schneider, 2018a). An analysis of current behavior and planning of new

behavior is a typical procedure. A vital role here plays the patient's resources, such as problem-solving abilities, which facilitate the implementation of new behavior (Wittchen & Hoyer, 2011). Problem solving training itself has been established as a common intervention in CBT (Aburezeq & Kasik, 2021b; Barkham et al., 2021; Nezu, 2004; Nezu et al., 2012).

Moreover, in other areas of research, problem solving has been shown as a concept being connected to behavioral flexibility. Griffin & Guez (2014) reviewed the connection of problem solving and innovation. They concluded that both concepts share characteristic features such as showing novelty responses and behavioral flexibility. They suggest:

> *That flexibility is most likely a multi-faceted concept, which encompasses the ability to inhibit a previously successful behavior, the ability to invent a new behaviour in new circumstances, and the ability to perform an existing behaviour in a new context, amongst others. (Griffin & Guez, 2014, p. 12)*

This connection between problem-solving skills and behavioral flexibility fits perfectly into the concept of behavioral resources in our model within the synergetic framework. As already mentioned in the section to psychological adjustment, more resources allow a wider spectrum of behavioral possibilities and options to tackle different situations, to transform therapeutic insights into action or to handle daily stressors.

#### 3.4.3.4. Broader view on Resources

As already mentioned above, resources within the person-environment based theories of problem solving resources refer to the internal capacities a person has to encounter external demands. As Heppner et al. (2004) writes:

> *The resource variables have been conceptualized as vulnerability or resistance to stress (Wortman et al., 1992) and explain why some people are able to cope with traumatic events while others experience a great deal of stress and adjustment difficulties. (Heppner et al., 2004, p. 358)*

Aside from the area of problem solving, behavioral resources are an important part of different approaches. Resources in general can be defined as almost anything that helps patients (Schiepek & Matschi, 2013) and promotes self-healing powers (Fiedler, 2012). A more precise definition by Gruber (2020, p. 11) in the context of psychotherapy characterizes resources as potentials of humans, which can be multifaceted and one does not need to beware of: abilities, competences, positive memories, skills, knowledge, expertise, approaches, experiences, talents, strengths. Within psychotherapeutic approaches, especially the solution-focused brief therapy (De Shazer & Dolan, 2008) and the salutogenesis

concept by Antonovsky (1987) brought the resource-based work into therapy (Schiepek & Matschi, 2013). Resources as an important therapeutic factor were also conceptualized by Grawe (2000) within his theory to the *Psychological Therapy*.

When looking at the terms mentioned in the wider concept of resources, the behavioral component of many is obvious. Summed up, behavioral competencies play an important role in the ability to navigate the world and find the balance between external challenges and internal needs and resources.

#### 3.4.3.5. Resources as Common Factor in Psychotherapy

This brings us directly to resources as a hypothesized common factor in psychotherapy. I.e. as an answer to *how therapy works*, (re)discovery, activation and learning of behavioral competencies play an important role (Lambert & Ogles, 2004). As already mentioned, Grawe (2000) suggests the *activation of resources* as an essential part of the therapeutic change process. He expatiates resources to help the patient transform motivation to action.

For a visualization of the involved processes, he uses the Rubicon-Model, a model for action phases by Heckhausen et al. (2013). In the model, the river Rubicon is the point of transformation from volition to action. On the left side of the river are the phases of motivation and volition building, which are mostly treated by psychodynamic and humanistic therapies. On the right side of the Rubicon, the phases of realization of the volitions and the assessment of the situations are settled. This is usually focused on problem-oriented therapies, like cognitive-behavioral therapy or solution-focused therapies (De Shazer & Dolan, 2008; Grawe, 2000).

Grawe (2000) further concludes, based on the model, that for "crossing the river" (i.e. realizing an intention) two important features are involved: firstly change - more precise the decision to and the action of crossing the river - can only be one by the patient him/herself. The therapist cannot change the patient or change for him/her. The common *problem perspective* in psychotherapy, which focuses on dysfunctional behavior, symptoms, etc., does not help to make the patient more confident or confident enough to start new behavior (Grawe, 2000). In order to strengthen the patients' self-confidence and self-efficacy/expectations, one needs to support his/her existing resources (e.g. social competences). Only through that he/she can be empowered to change. At the same time, those self-efficacy expectations:

> *Are based on the interpretation of the actual situation, all improvements to the prevailing life situation, that is actual changes in the behavior of interaction partners, actual changes in work conditions etc., contribute to changes in expectations as well and it is these changes in the real life situation that can change expectations particularly effectively. This explains the positive effects of therapies not so much focused on changing something in the patient's mind, but in the conditions of his actual everyday life. (...). (Grawe, 2004b, p. 57)*

This means that resources, such as behavioral competencies, can work twofold in the therapeutic change process. An activation of those resources can help the patient tackle hurdles as a skill and to feel more confident about that, i.e. impacting the appraisal. At the same time, the application of those competencies can impact the expectancies as well. This interaction is further explored in chapter EQUATION: M - MOTIVATION (P. 232) . As mentioned by Grawe (2000) further theories covering the transformation from volition to action are the action-control-theory (Kuhl, 1983) and the self-management therapy by (Kanfer et al., 2012, respectively; Kanfer; 2013).

More recent research about common factors revealed behavioral related factors as well. In their paper about placebo effects in psychotherapy, Enck & Zipfel (2019) describe a *process factor regarding action*, which is supported theoretically by Lambert & Ogles (2004) and data-driven by Huibers & Cuijpers (2015). The Factor includes behavioral skills (e.g. practice, taking risks, facing fears), as well as behavioral regulation components (e.g. handling problems, finding solutions, reality testing). This characterization of behavioral aspects in the process of psychotherapy is consistent with our concept of behavioral competencies (r) as a parameter in the psychotherapeutic change process.

#### 3.4.3.6. Behavioral Resources as Interventions in Psychotherapy

When behavioral resources are an important part of a mode of action of psychotherapy, they should be used as interventions as well. This is also what can be found. In cognitive-behavioral therapy, the patients' behavior plays an important role - as the name already says. Behavioral analysis, such as the SORKC Model (originally introduced by Kanfer & Saslow, 1969), problem solving training (Liebeck, 2015; Nezu, 2002; Wittchen & Hoyer, 2011) and training of behavioral competencies in the form of role-plays (Margraf & Schneider, 2009a) are part of common procedure. Grawe (2000) also lists the classical problem-solving training used in cognitive-behavioral therapy or dialectic behavioral therapy as important bricks in the intention realization process (in the Rubicon model), as they help to transform insights, intentions, cognitions etc. into action.

#### 3.4.3.7. Behavioral Resources & Interpersonal Communication

The last part, presented here, of the parameter behavioral resources is its connection to interpersonal communication. The keyword here are social competencies, which are counted as a part of behavioral skills, partly as a special form of problem solving (Asendorpf & Neyer, 2012). Social competencies are related to the effectiveness of problem solving, i.e. ineffective problem solving goes along with fewer social skills (D'Zurilla & Goldfried, 1971; Heppner et al., 2004; Nezu, 2004). In turn, training of social competencies is a part of cognitive-behavioral therapy as well (Güroff, 2021).

Taken together, behavioral competencies cover an important aspect of the psychotherapeutic process, as they can be a target point of therapy if they are poorly developed, and describe a person's capability to transform the newly learned insights into action.

### *3.4.4. Parameter m - Motivation to Change as Trait*

| Author/Group | Theory | Reference |
|---|---|---|
| control master theory | health plans as a representation of own needs and strategies to do so | (Silberschatz, 2013) |
| self-efficacy | self-efficacy expectations | (Bandura, 1982) |
| | learned helplessness | (Seligman et al., 1979) |
| | negative cognitive triad | (Beck, 1979) |
| | self-determination theory | (Deci & Ryan, 2000) |
| common factors | hope and expectancy effects | (Lambert & Ogles, 2004; Wampold et al., 2018) |
| | demoralization of patients | (Frank & Frank, 1993) |
| approach and avoidance motivation | approach and avoidance motivation, and the relation to security and arousal | (Scheffer & Heckhausen, 2018) |

***Table 11:*** *Theoretical concepts related to m.*

When we think about different people, why do some engage in psychotherapy, and some do not? And why do some people stay in psychotherapy, even when it is hard and difficult and some leave when, e.g. an exposition would be the next step? Generally speaking, why do some people have an inherent drive to evolve, to change, and to challenge themselves? One potential aspect here could be a motivation-like trait. The third parameter of the model

is exactly that motivation to change as a trait (m). It focuses on motivation as an inherent part of personality, as a predisposition that makes it more likely that people approach new tasks and engage in difficult, but rewarding challenges - like psychotherapy. **Table 11** (p. 124) summarizes the theoretical concepts related to m.

The conceptualization of Motivation as Trait includes aspects of the control master theory ("health plan"), self-efficacy expectations (and learned helplessness as the other side of the spectrum), hopefulness and expectation-effects. The findings are further connected to neural concepts of the asymmetric frontal cortical activity, approach and avoidance motivation, reward expectation, locus of control, self-determination theory, as well as their correlations to the big five.

Motivation has a situational aspect - covered with variable M in our model, and a dispositional aspect - covered with m in our model. According to Scheffer & Heckhausen (2018) are dispositional factors of motivation:

> *Assumed to explain why some people show certain patterns of motivated behavior across situations, whereas others do not. Apart from specific situational stimuli, motivation is thus attributed to stable traits that are rooted in the individual personality and that distinguish between people across situations and, to a certain extent, over time. (Scheffer & Heckhausen, 2018, p. 67)*

There have been developed various theories around trait motivation, trying to explain the phenomenon.

#### 3.4.4.1. Control Master Theory

One of them is the control master theory (Silberschatz, 2013). It postulates so called "health plans" or "maps" that represent the own needs, possible ways and strategies how to fulfill them and the efficacy of those. The maps do not need to be conscious. However, they directly influence behavior. Silberschatz (2013) describe them further: "in order to adapt to our environment we develop *beliefs* about our family, our relationships, our world, and ourselves. This process of developing and testing beliefs begins shortly after birth and continues throughout life" (Silberschatz, 2013, How Psychotherapy Develops section, para. 1). The map-building and belief-testing process is further influenced by the perception of safety and danger, which is further discussed in the chapter on approach and avoidance motivation.

The connection between the control-master-theory and motivation is made within the drive to disconfirm pathogenic beliefs. This motivation can be seen as an inherent drive towards

problem solving and mastering a conflict, which is part of the patient's plan (Silberschatz, 2015). "The Control-mastery theory posits that patients come to therapy in order to get better and that they have an unconscious plan or strategy for doing so; the plan is to disconfirm pathogenic beliefs" (Silberschatz, 2013, The Patient's Plan section, para. 1).

#### 3.4.4.2. Self-Efficacy

##### *3.4.4.2.1. Self-Efficacy Expectations - Bandura*

The maps enunciated in the control-master-theory overlap with the concept of self-efficacy expectations, formulated by Bandura (1982). The theory describes the self-experienced efficacy of the own behavior, i.e. if it feels like the things I am doing have an impact. The theory is counted to the social-cognitive learning theories. They generally assume that beliefs regarding the efficacy of the own behavior are based on prior experiences. Those experiences generalize and affect the assumptions of the own efficacy and application of new behavior (Bandura, 1982; Nezu, 2004). Higher self-efficacy is associated with increased subjective well-being, and lower risk for mental disorders and better recovery there of (D'Souza et al., 2020; Schunk & DiBenedetto, 2021). Together with the factors hope, optimism, generalized self-efficacy was found as a predictor of higher well-being and lower depression in a sample of 6.000 elderly in Germany (D'Souza et al., 2020).

##### *3.4.4.2.2. Learned Helplessness - Seligman*

If a high self-efficacy is on one end of a spectrum, learned helplessness is on the other side. The concept was first introduced as an explanation of the phenomena of Pawlow's dogs, which did not continue to search for food, if there was no contingent relation to their effort getting it (Seligman et al., 1979). The theory later was extended by Abramson et al. (1978) as an explanation for developing depression. It assumes that patients develop the belief that their actions do not alter the environment, e.g. because of stressful experiences (Abramson et al., 1978; Clark et al., 2009). This results in anhedonia, decreased and stagnant learning (Abramson et al., 1978; Clark et al., 2009). In other words, it could be framed as an overall decreased trait approach motivation due to life experiences.

##### *3.4.4.2.3. Negative Cognitive Triad - Beck*

A similar concept of internalized negative self-beliefs is the cognitive triad formulated within Beck's widespread cognitive theory of depression (Beck, 1979; Wittchen & Hoyer,

2011). Beck describes dysfunctional negative schemata, which are developed throughout the patient's life, beginning in early childhood. The schemata shape day-to-day behavior, selection and interpretation of situations and are self-reinforcing (Margraf & Schneider, 2009a). Those negative schemata include a characteristic triad of negative thoughts of the world, the self, and the future (Margraf & Schneider, 2009a).

#### *3.4.4.2.4. Self-Determination Theory - Deci & Ryan*

In both concepts - learned helplessness and the negative triad - people stop approaching and keep avoiding situations because they do not feel competent and effective enough. The self-determination theory (SDT) describes different kinds of motivation which drive behavior, from externally motivated up to intrinsic motivation, which does not need an external reward to perform (Deci & Ryan, 2000, 2008). Motivation is closely linked to their formulated psychological needs, where autonomy is one of them. The SDT postulates better performance and higher well-being, when behavior is driven by intrinsic motivation (i.e. there is an internal locus of causality/control) (Deci & Ryan, 2000). In addition, intrinsic motivation often goes along with a sense of autonomy. Hence, if people feel self-governed by what they do, they do it with a more inherent kind of motivation. In turn, if people do something because they inherently want it to do, and they can do it, they feel more autonomous. A huge base of research has proven this hypothesis (Deci & Ryan, 2000, 2008).

The SDT provides the foundation for other motivational concepts in the context of trait motivation. The postulated need for autonomy and the distinction between intrinsic and extrinsic motivation can be seen as mechanisms underlying health plans (control-mastery theory), self-efficacy beliefs (Bandura), learned helplessness (Seligman), and the cognitive triad (Beck). If a person continuously feels deprived of autonomy because of external factors (e.g., controlling parents, multiple setbacks in social contexts), their intrinsic motivation to continue exploring will decrease. This, in turn, is reflected in poorly developed self-efficacy beliefs.

### 3.4.4.3. Hope & Expectancy Effects

Similar to the concepts of self-efficacy beliefs, is the conception of expectancy effects and hope. The factor is also part of the patient-factors in the widely researched common factors (Fiedler, 2012; Lambert & Ogles, 2004). The expectancy effects describe the effect of the

patient's expectation of the effectiveness of the therapy. In other word, does the patient believe in the procedure and in healing/getting better and does he/she experience the already taken steps in therapy as effective. If he/she does so, the probability of improvement is higher (Wampold, 2001; Wampold et al., 2018). The well-known psychotherapist Jerome D. Frank already mentioned the importance of hope and expectancy in psychotherapy in the 1960s (Enck & Zipfel, 2019; Wampold & Weinberger, 2010). He identified the state of patients as *demoralized* and in need of hope. Psychotherapy was assumed to work at the factor of hope: "They [patients] hope and expect that psychotherapy can help them overcome these heretofore insurmountable issues. Once these hopes and positive expectations are in place, the demoralized state improves" (Wampold & Weinberger, 2010, p. 34).

With his work, Frank set the foundation for the common factors research, which established expectancy effects further empirically within the patient-variable (Enck & Zipfel, 2019; Wampold et al., 2018). Expectancy effects include the patient's openness vs. defensiveness (Garfield, 1990; Orlinsky, 2009), the inherent motivation to change (Fiedler, 2012) and "expectations of personal effectiveness" (Enck & Zipfel, 2019; Lambert & Ogles, 2004). Wampold (2001) explain the effect of hope of improvement with the induction of positive expectations, which in turn can also be seen as a kind of trait motivation to involve in the therapeutic process more energetically and approach the challenges in order to develop, rather than resigning as the learned-helplessness as demoralizes state would be. To some extent the expectancy beliefs are discussed as placebo-effects, especially in purely medical-drug-related contexts (Enck & Zipfel, 2019). However, in psychotherapy, it is a more central, supported common factor of functioning than an undesired side effect. Current reviews underline the importance of expectancy effects in psychotherapy (Constantino et al., 2018; Norcross & Goldfried, 2019). Grawe (2000) mentions self-efficacy and expectancy as important factors as well in psychotherapy. He describes the beliefs in the scope of the expectancy x value theories. Especially in the process of activating resources, the experience of the own effectiveness helps to transform motivation into behavior.

#### 3.4.4.4. Approach and Avoidance Motivation as Result of Interaction of the Need for Security and Arousal

To get the connection between expectancies and trait motivation closer, two additional arguments will follow. First, some findings indicate that self-efficacy beliefs are not a separate construct, because they are confounding massively with "purely" motivational

variables. I.e. trait motivation could drive the self-efficacy beliefs, without them being a separate construct (Williams & Rhodes, 2016). But more research is needed here.

However, Scheffer & Heckhausen (2018) explain the connection between expectancies, emotions and motivations as traits very good. They describe traits as *heightened sensitivity to experience certain emotions*. For example, the traits openness, as well as extraversion postulated within the Big 5 model, facilitate the experience of positive emotions. But not only the experience of positive emotions, they also increase the likelihood that people with those traits engage in situations which deliver possibilities of experience those emotions. In turn, those emotions are more often experienced by those people who experience positive emotions more easily and are more often in situations which hold the possibility of experiencing positive feelings. A further step in this virtuous cycle is the development and strengthening of positive expectancies regarding experiencing positive emotions in different situations. The relation between motivation and personality traits, like extraversion (approach) and neuroticism (avoidance) is already established (Elliot & Thrash, 2010; Judge & Ilies, 2002; Scheffer & Heckhausen, 2018). However, the role of openness (approach) is less clear (Judge & Ilies, 2002). In a meta-analysis, reviewing the influence of traits on risky behavior and coping was evaluated (M. L. Cooper et al., 2000, sample 18-25yo.). People scoring high in neuroticism engaged in risky behavior as coping for aversive mood states, whereas people scoring high in extraversion, engaged in risky behavior in order to enhance positive states. This aligns with the assumption that a general trait motivation to approach enhances the experiences of positive emotions - even in difficult situations.

Similar to Scheffer & Heckhausen (2018) is the Zürich Model of Social Motivation by Bischof (1975). It postulates that which situations we choose, how we behave in situations and how we experience them is a complex interaction of needs and traits we have. The theory assumes two basic traits of motivation: approach and avoidance motivation, which are connected to the two basic needs of arousal and security (Scheffer & Heckhausen, 2018). Depending on the value of both of the needs (i.e. security x arousal), an individual set-point arises, which influences the self-actualization goals which are approached. If someone has a low need for security, and a high need for arousal, more unfamiliar and risky challenges are approached. I.e. the needs for security and arousal influence the trait motivation a person has.

#### 3.4.4.5. Approach & Avoidance Motivation

Further research to approach and avoidance motivation revealed that individuals with dominant avoidance traits tend to choose challenges that are too easy. People with approach motivation are more likely to involve in difficult tasks that are close to their ability, although they hold the possibility of failure and development (Scheffer & Heckhausen, 2018). Fitting this into our model of motivation to change as a trait, people with high approach motivation should score high on the parameter m, because they tend to involve in unfamiliar tasks, such as therapy, and want to challenge and develop themselves.

#### 3.4.4.6. Neural Correlates of Trait Motivation

Because those tendencies to approach or avoid are quite stable across situations, it is assumed that it is a trait like feature (Wasserman & Wasserman, 2020). There are neural correlates that support the approach/avoidance distinction, as well as the stability of motivation (see Wasserman & Wasserman, 2020 for an overview, esp. Cameron & Pierce, 2002, Rawsthorne & Elliot, 1999). One of the established correlates regarding the approach/avoidance distinction is the asymmetric frontal cortical activity (Corr et al., 2013; Read et al., 2010). Every person tends to have a rather active right or left frontal cortex. A higher activation of the left hemisphere goes along with a higher approach motivation. Higher activation of the right hemisphere goes along with higher avoidance motivation (Harmon-Jones et al., 2010; Wasserman & Wasserman, 2020). First studies were already conducted in the 1930s (Goldstein, 1939) on patients with brain damages. Results showed that damages of the left hemisphere were more often associated with depression, and damages of the right hemisphere with euphoria (Harmon-Jones et al., 2010). Since then, many studies have established the phenomenon of asymmetric frontal cortical activity and its relation to motivation (see Harmon-Jones et al., 2010 for an overview). Corr et al. (2013) and Read et al. (2010) provide a detailed overview of neural correlates to approach and avoidance motivation, correlates to traits of extraversion, openness and neuroticism, as well as connections to different concepts of motivation theories.

Other concepts that are connected to self-efficacy are reward expectation and perceived locus of control. They describe the ability to experience and attribute reward internally, i.e. the self is the cause of the rewarding effect and hence can be "praised" (Hashimoto et al., 2015; Kujawa et al., 2020; L. Murray et al., 2018). Both concepts have good established

neural correlates and hence are an interesting brick in the role of trait-motivation in psychopathology. Some results indicate that reward-seeking personalities (reward seeking was defined as an overarching trait here) tend to detect reward associated stimuli faster than lower-scoring people on this trait (Hickey et al., 2010). Weinberg & Sandre (2018) also found attentional deficits, using EEG measures (P300 component), regarding sustained attention to reward and increased attention to threat depending on higher levels of anxiety and depression. Umemoto & Holroyd (2017) also showed that individuals with depression appear to have deficits in reward valuation and, as a result, also deficits in reward learning. This would have important implications for psychotherapeutic practice, when an impaired or decreased approach motivation in mental disorder already influences the perception of positive stimuli. Reward-oriented interventions (implementation of positive activities in order to alter the negative self-efficacy-beliefs), as often used in the CBT, might be needed to be complemented by even smaller attention-altering exercises. However, a review assessing the relation of depression and reward processing found an association of impaired reward processing in depression, but concluded that there is not enough evidence to draw explicit conclusions for clinical samples (Nielson et al., 2021).

Summing up, there is much evidence of motivation as situation-over-arching traits. Especially the distinction of approach and avoidance motivation can be found in many theories, as well as neuronal correlates. This strengthens our conception of motivation to change (i.e. approach) as an important trait-like factor in the process of psychotherapeutic change.

## 3.5. Functions of the Model: Relations Between the Variables

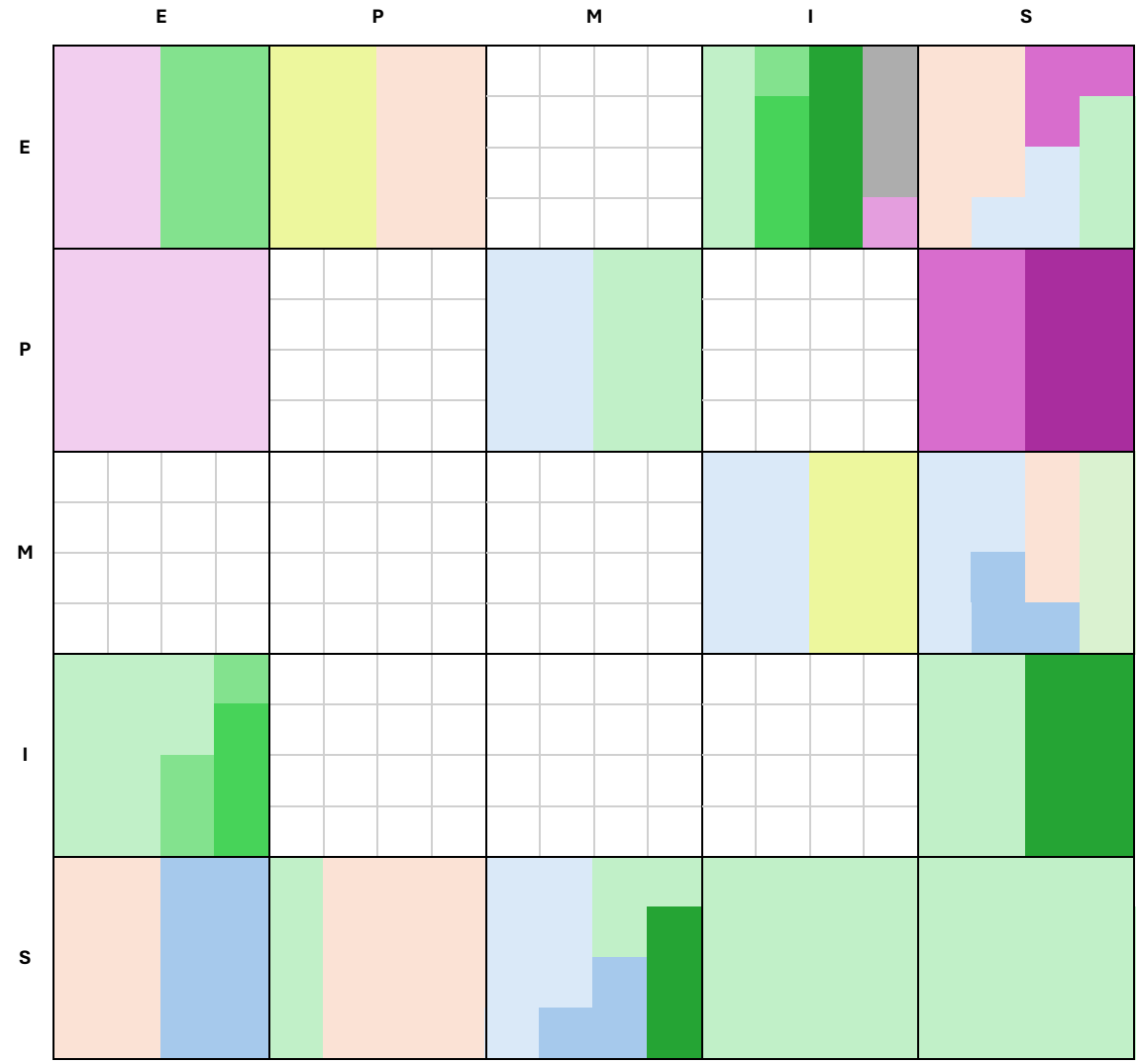
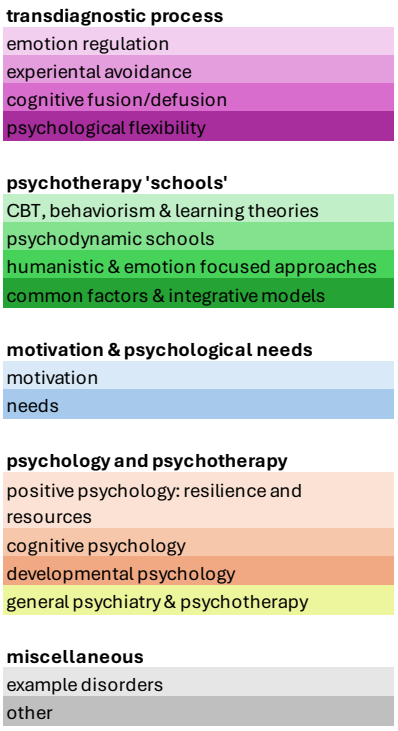



***Figure** 7: Matrix of the 16 functions, color-coding the different theories that support each function. The color-coding is depicted in the legend below. A detailed matrix can be found in the appendix.*

The introduced variables are assumed to interact with each other. The theoretical foundation and empirical evidence supporting those interactions are outlined below. Additionally, the interactions are mathematically captured within five coupled nonlinear equations (one for each variable). The equations can be found in the appendix and are discussed in Schiepek et al. (2017) and Schöller et al. (2018). They are not covered within this thesis. Further, the interactions between the variables are influenced by the parameters. For a more detailed explanation of the interactions of the parameter and variables, see Composition of the Model (p. 53).

**Figure 7** (p. 132) depicts a matrix of the four parameters, color-coded by the different theories that support each variable. In Appendix E: Matrix of the Functions (p. 331) a detailed version of the matrix above can be found, depicting every included theory by name and color-coded.



### 3.5.1. Functions of E - Emotion

The variable E, representing emotions over a spectrum reaching from negative (E-) to positive emotions (E+), is assumed to interact with all variables, except M (state motivation). The relations are partly depending on or are influenced mainly by the parameters c (cognitive competencies), r (behavioral resources) and m (trait motivation).

#### 3.5.1.1. Function E → E

| Theory | Reference |
|---|---|
| emotion regulation | (Gross, 2015) |
| level of structure OPD | (Cierpka et al., 2014) |
| example: emotion regulation disorders and processes (BPD, rumination) | (Nolen-Hoeksema et al., 2008) |
| **mediating parameters** | |
| cognitive competencies c | |

***Table 12**: Theoretical concepts related to E → E*

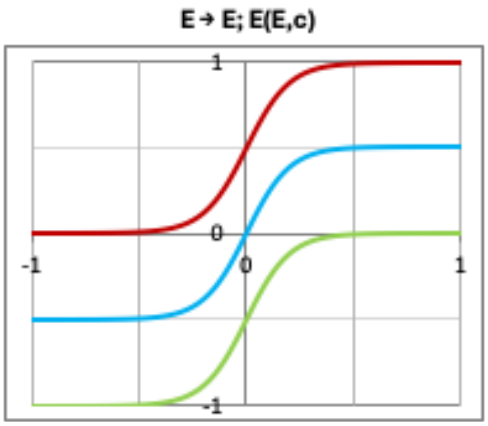



***Figure 8**: Graph of the function E → E (x-axis: input, y-axis: output).*

The first function discussed is the "autocatalytic effect of E on itself" (Schöller et al., 2019, p. 99). This basically describes the process of emotion regulation. Emotions can be, depending on the cognitive competencies (including mentalization and emotion regulation), up- or down-regulated. A person with a good emotion regulation (i.e. high levels of c) can effectively down-regulate unpleasant emotions. Positive emotions can be better sustained and slightly moderate negative emotions might be even transformed into positive ones. Low levels of c go along with an ineffective regulation of positive and negative emotions, leading to an increase in stressful emotions and even a transformation of moderate positive qualities to negative emotions (Schiepek et al., 2017). **Table 12** (p. 134) summarizes the theoretical concepts related to E → E.

This can be visualized using the graph of the corresponding function: it displays a sigmoid growth function, showing a damped effect at very intensive emotions (very negative, as well as very positive), with the highest slope at medium-intense emotions. Depending on the levels of c, the entire function is placed more on the positive or to the negative part of the y-axis, reflecting the moderating role of c (Schiepek et al., 2017). **Figure 8** (p. 134) represents the graph of the function.

#### *3.5.1.1.1. Theoretical Foundation of the Autocatalytic Effect of E*

The theoretical foundation of the moderating role of on the autocatalytic effect of E can be found in the concept of emotion regulation. Emotion regulation and mentalization allow the attenuation of unpleasant and holding on to pleasant emotions functionally, as well as the transformation of moderate negative to positive emotions. Gross (2015) nicely outlines these three ways of regulation within his theory:

> *Sometimes, people change the intensity of emotion by increasing or decreasing emotion experience or behavior (e.g., hiding one's feelings of distress from one's colleagues at work: Smith & Kleinman, 1989). At other times, people change the duration of emotion by increasing or decreasing how long an emotion lasts (e.g., drawing out a positive feeling by sharing good news with others: Gable, Reis, Impett, & Asher, 2004). At still other times, people change the quality of an emotional response (e.g., seeing the humorous side of an embarrassing situation: Samson & Gross, 2012). To achieve these goals (or ends), people employ emotion regulation strategies (the means to achieve these ends). (Gross, 2015, p. 5)*

Though, it remains unclear what way of action the transformational effect uses: it could be a 'real' transformation of negative to positive emotions, as well as a dampening effect of negative emotions through inducting positive emotions (Quoidbach et al., 2015), or a simple reduction of negative emotions to the baseline through e.g. regulation strategies like reappraisal (Gross, 2015). However, the way of action is, the visible effect is covered within the function E → E.

Besides the previous assumption, we would complement this effect of emotion intensity with the ability to sustain negative and positive emotions in their intensity without getting 'overwhelmed' or drifting to dysfunctional cognitions or behavior. This ability of sustaining emotions is also described in the level of structure based on the OPD (Bion & Bion, 2013; Cierpka et al., 2014).

#### *3.5.1.1.2. Neurobiological Mechanisms and Findings of the Autocatalytic Effect of E*

There are several aspects of the autocatalytic effect of E and the influence of c that can also be found on a neurobiological level.

First, the damped onset and offset of E can be viewed as a kind of self-limiting process. Emotions are informative reactions to situations, which should naturally abate after a while as the situation has ended - at least in healthy individuals. This self-limiting effect, preventing unlimited growth in any direction, can be found in many (neuro)biological circuits and physical systems (e.g. blood pressure Sterling, 2012). Tretter & Löffler-Stastka (2018) describes a similar mechanism of regulating reciprocal inhibition, in their hypothesized emotion network.

Second, there is a vast body of research supporting the effects of emotion regulation on positive and negative emotions on a neurobiological level. The main involved brain areas for the generation of emotional states are the limbic system (amygdala, ventral striatum) and areas of the anterior cingulate cortex (ACC). At the same time, areas of the prefrontal cortex (PFC), such as the ventrolateral, dorsolateral and medial PFC, are involved because of the cognitive regulation of emotions (Joormann & Stanton, 2016; Morawetz et al., 2017). The activation of those brain areas is not just based on resting-activity correlates, but can be seen in real-time fMRIs (Linhartová et al., 2019). The activity in the emotion regulation related areas changes during the regulation-process and distinctions in patient populations with impaired emotion regulation can be found. Further the activation of involved brain areas are found throughout different emotion regulation strategies (Buhle et al., 2014), as well as in the up- and down regulation of positive and negative emotions (see Alexander et al., 2021 for a review of neural correlates of positive emotion regulation; see Kalokerinos et al., 2015 for a review of downregulation of positive and negative emotions; Colombo et al., 2021; Morawetz et al., 2017). The capacity of emotion regulation and activation of the ventral striatum was even linked to the daily affect, in a study combining fMRI during emotion regulation and a ten day ecologically momentary assessment of affect (Grosse Rueschkamp et al., 2019, n = 63 healthy adults). Similar results were obtained in an experiment using event-related potentials, showing a relation between the Reward-Positivity amplitude, level of emotion regulation and overall affect (Irvin et al., 2022, n = 100). A better upregulation of positive affect was associated with higher general well-being and a higher ERP amplitude, and vice versa. The PFC-areas were consistently shown to be the driving

force for the up- and down-regulation of positive and negative emotions (see Min et al., 2022 for a nice graphical metaphor and overview; Morawetz et al., 2017; Ochsner et al., 2004). Morawetz et al. (2017) linked different emotion regulation processes and strategies with cognitive functions and neural networks. For example, they linked the technique of (re)appraisal to the concept of theory of mind. Taken together, the findings regarding the activated areas in the process of emotion regulation (predominantly PFC-areas) overlap tremendously with the activated brain areas related to cognitive competencies introduced in chapter Neurological Underpinnings and Similarities of the Concepts (p. 114). Emotion regulation a (Etkin et al., 2015) and mentalization (Luyten & Fonagy, 2015) show similar neuronal patterns, as found in the fMRI studies of up- and down-regulation of emotions. Thus, the role of c in the autocatalytic effect of E can be seen at a neurobiological level.

#### *3.5.1.1.3. Effects of Emotion-Regulation Disorders on the Autocatalytic Effect of E*

Another way of examining the relation E → E and the role of c is by looking at disorders with an impaired emotion regulation and mentalization, i.e. low levels of c. Hence, affected patients should experience unregulated, maybe even erratic and overwhelming emotions. This is exactly what can be found on a symptomatic and neurobiological level. Many disorders have been shown to go along with disturbances in emotion regulation and cognitive control, e.g. depression, anxiety, bipolar disorders or borderline personality disorders (BPD) (Joormann & Stanton, 2016; see Carl et al., 2013, p. 345 Table 1 for a structured overview of impaired areas of emotion regulation). Depression and anxiety are usually accompanied by decreased up-regulation of positive emotions and elevated down-regulation of positive emotions, as well as increased sustaining of negative emotions (Carl et al., 2013; Dunn, 2012; Ehring et al., 2010). The concept of rumination could be an exemplary description of the process of sustaining negative emotions. Rumination is a "mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and on the possible causes and consequences of these symptoms" (Nolen-Hoeksema et al., 2008, p. 400).

There are many theoretical considerations regarding the composition of the construct of rumination (see H-EX-A-GO-N model in Watkins & Roberts, 2020). But one component, fostering rumination, is an assumed impaired executive function - a part of cognitive control. Ruminating humans fail to adequately monitor and regulate their emotional experience, in this case by altering thoughts, updating working memory content etc. (for a detailed

explanation and connection to further concepts and findings, like task switching ability etc. see Watkins & Roberts, 2020). In other words, negative emotions are ineffectively down-regulated, or even up-regulated. The process described with the function of E → E. Rumination (or repetitive thinking) is even conceptualized as a trans-diagnostic factor, occurring in depression, anxiety disorders, eating disorders, or obsessive-compulsive disorders (Ehring & Watkins, 2008; Nolen-Hoeksema et al., 2008; Smith & Alloy, 2009; Watkins & Roberts, 2020). But not only rumination, also emotion regulation itself has been established as a trans-diagnostic factor as well (Sloan et al., 2017). Accordingly, depression has consistently been shown to be attended by impairment in cognitive control and emotion regulation, connecting both concepts, as also already done theoretically in Parameter c - Cognitive Competencies (p. 108) (Joormann & Stanton, 2016; Silton et al., 2020). This relation is also visible on a neurological level, as depressed individuals show a decreased activity in prefrontal regions, which are associated with regulating emotions (Disner et al., 2011; Joormann & Stanton, 2016; van Kleef et al., 2023; E. C. Walsh et al., 2019). Additionally, hypoactivity was found in areas related to the experience of positive emotions, supporting the hypothesis of inability to sustain positive affect (Heller et al., 2009). Also, BPD patients show an increased use of dysfunctional and less functional emotion regulation strategies (Daros & Williams, 2019), as well as a decreased activation of brain areas involved in emotion regulation (Van Zutphen et al., 2015).

Interestingly, it has been shown that emotion regulation improved, and dysregulation decreased as a consequence of psychotherapeutic treatment, regardless of disorders or intervention (Sloan et al., 2017). Improvement after therapy can be found on a symptomatic level (decreased negative and increased positive affect), as well as at a neurobiological level (Linhartová et al., 2019). Similar results have been found in patients with BPD, PTSD, and schizophrenia, but are less robust due to weaknesses in study construction or reported data (Linhartová et al., 2019). Furthermore, it has been shown that depressed individuals improve in the application of functional emotion regulation strategies when they are supported with an *adequate scaffolding* (Joormann & Stanton, 2016; Silton et al., 2020). This scaffolding might work as a kind of external, supporting cognitive control.

These findings are in line with the assumptions made by our model. There must be an overarching mechanism, process or person-characteristic, which evolves throughout the psychotherapeutic process in order to maintain the changes. In this case, the ability of emotion regulation and cognitive control as part of the parameter cognitive competencies (in other

words: trait like personality dimension), improved throughout therapy and allow a new, more functional quality of emotion regulation after treatment. Hence, the autocatalytic effect of E, driven by c, is shifted 'upwards' on the y-axis. I.e. negative emotions are more efficient, down-regulated, maybe even transformed into positive emotions, and positive emotions can now be sustained more easily.

However, neurobiological findings regarding the transformation of negative to positive emotions are not extensive. Zhang et al. (2022) conducted a study comparing regular to creative reappraisal, showing a change in neuronal activity of the insular cortex (posterior to anterior) when a negative-to-positive-transformation was made.

Taken together, the findings support the regulating role of c on emotion-experiencing. Good levels of cognitive competencies allow a functional and flexible way of sustaining up- or down-regulation emotions in an adequate manner. Disorders associated with impaired emotion regulation (low levels of c) show corresponding symptoms of over- or under-regulated positive and negative emotions, which can be improved through psychotherapy by enhancing cognitive competencies (c). There is a valid body of research supporting the autocatalytic effect of E. Based on the findings, we would recommend to keep the function in the model.

#### 3.5.1.2. Function E → I

*In order to go beyond, you have to go through. —Osho*

##### *3.5.1.2.1. Connection Emotion and Cognition as a Central Mechanism of Work in the Psychotherapeutic Process*

| Theory | Reference |
|---|---|
| process of problem actualization | (Grawe, 2004b) |
| engagement with painful material | (Hill et al., 2007) |
| activation of states of mind | (Horowitz, 1987) |
| therapeutic cycle model: connecting emotion and cognition | (Mergenthaler, 1996) |
| 'follow the pain' as a maxim in emotion focused therapies | (Greenberg, 2015) |
| focusing work: emotional arousal in the therapeutic process | (Gendlin & Gendlin, 2014) |
| self-exploration process | (Tausch & Tausch, 1971) |

| Theory | Reference |
|---|---|
| process-experiential approach | (Rice et al., 1996) |
| self-explication process, depth of processing | (Sachse, 1992) |
| confronting unpleasant truths | Freud, (Messer & McWilliams, 2007) |
| **therapeutic interventions & dysfunctional patterns of E → E** | |
| trans-diagnostic factor of experiential avoidance | (Hayes et al., 1996) |
| rupture repair sequences | (Stiles et al., 2004) |
| classical exposition interventions in CBT | (Margraf & Schneider, 2018a) |
| rescripting as exposition in CBT | (Ehring, 2019) |
| importance of arousal: emotional processing theory | (Foa et al., 2006) |
| importance of arousal: dual representation theory | (Brewin & Burgess, 2014) |
| **mediating parameters** | |
| therapeutic alliance a | |
| cognitive competencies c | |

***Table 13:*** *Theoretical concepts related to E → I*

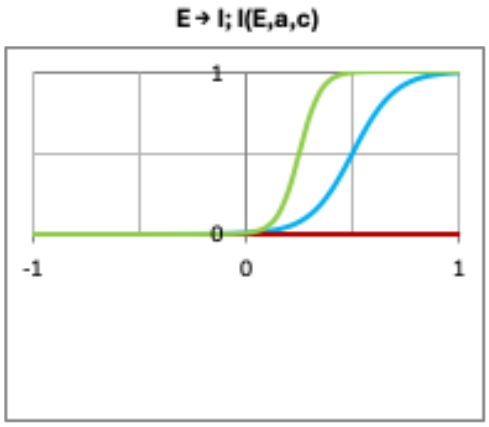



***Figure 9:*** *Graph of the function E → I (x-axis: input, y-axis: output).*

The next function is the relation between emotions and insight, E → I. It relates to the probably most central mechanism in psychotherapy: the need of emotional activation and participation in order to gain insight (Schiepek et al., 2017), i.e. the connection of emotion and cognition (Greenberg, 2015; Mergenthaler, 1996; Yalom, 2010). **Table 13** (p. 140) summarizes the theoretical concepts related to E → I. **Figure 9** (p. 140) represents the graph of the function.

As already outlined in the chapter INSIGHT IN PSYCHOTHERAPY (P. 89) insight refers not to an educational aspect of gaining new knowledge, but to a process of getting aware of the own emotions and schemata, connecting emotions and cognitions, "not in an intellectual-rational fashion, but rather in a way where he (the patients) identifies with his intentions"

Grawe, 2004b, p. 66, process of problem actualization) . This mechanism has been formulated and used in many psychotherapeutic approaches. Hill et al. (2007) describe the need for emotional arousal through the activation of schemata and the engagement with painful material in order to gain insight. Horowitz (1987) specifies so-called *states of mind*, which are emotion associated schemata, which should be activated throughout the insight process. Also, Mergenthaler (1996) characterizes the process of achieving a qualitative new state of insight within his therapeutic cycle model though the connection of emotion and cognition. The most well-known advocate of emotional activation in therapy is probably Leslie Greenberg. Within his emotion-focused therapy, a huge emphasizes is laid on the maxim to 'follow the pain' (Böcker, 2018; S. Johnson et al., 2023). This basically describes the search for and experience of painful emotions, accompanied by self-related cognition, in order to achieve a new inner organization (Greenberg, 2015; Orlinsky et al., 2004). Also, Gendlin & Gendlin (2014) uses the centralization of experiences, similar to Greenberg, but with even a more body-centered perspective, in his focusing work, in order to establish an emotional arousal for the therapeutic process. Last but not least, regarding the theories, Grawe (2004b) condensed already several concepts, as already outlined in VARIABLE I - INSIGHT (P. 88) , which describe the combined activation of emotions and cognitions. Some of these are, just for recapitulation, the self-exploration process by Tausch & Tausch (1971), the process-experiential approach by Rice et al. (1996) and the self-explication-process by Sachse (1992). Grawe adopted in his *Psychological Therapy* the last term of self-explication. It describes the process of insight with its necessities, which one of them is the emotional activation. Grawe supposes that only through the emotional involvement, a new quality in the sense of a new perspective (a higher level of organizational clarity) can be achieved. Sachse (1992) himself concretized this even more in his scale *depth of processing*, encompassing eight stages with increasing emotional involvement.

Summing that up, all those approaches and concepts lean on one classical '*look into the abyss*' paradigm, which has been used since by the first psychoanalytic concepts, e.g. in form of suppressed conflicts or the term of 'working through' (Grawe, 2004b). In its core the paradigm encompasses the assumption, that an involvement and confrontation with negative emotions, memories and cognitions has to take place, in order to gain a new inner organization ('hot insight'), which allows less psychological strain and more freedom (e.g. absence of fear like in anxiety disorders). Freud already stated that "to be free of neurosis, one has to confront unpleasant truths" (Messer & McWilliams, 2007, p. 11). Many

therapeutic concepts have been based on that paradigm. Some of them were already introduced. But also in newer empirical oriented research, the importance of including and confronting negative emotions has been shown. For example, do rupture-repair sequences (or resolution of conflicts), as a situation for confronting and resolving negative experiences, ultimately show a positive impact on the therapeutic relation and outcome (Barkham et al., 2021; Garfield, 1990; Holtforth & Michalak, 2012; J. Safran et al., 2014; J. D. Safran & Muran, 1996; Silberschatz, 2015; Stiles et al., 2004). Further is an avoidance of negative emotions associated with worse therapeutic effects (L. Greenberg, 2006) and even conceptualized as a trans-diagnostic factor of *experiential avoidance* (Gratz & Roemer, 2003; term coined by Hayes et al., 1996 within ACT; Hayes et al., 2006; Mennin et al., 2005). In addition, the confrontation with negative emotions is an important part of exposition interventions in cognitive-behavioral therapy. So is it used in 'classical' exposition treatments for anxiety disorders or OCDs (Margraf & Schneider, 2009b; Margraf & Schneider, 2018a), but also confrontational trauma therapy methods like *rescripting* are based on the confrontation with and through that integration of negative emotions and memories (Ehring, 2019).

#### *3.5.1.2.2. The Need for Appropriate Levels of Arousal*

In order to keep the process of *hot insight* activated, a certain emotional arousal is needed, as already mentioned. However, if the emotions are overwhelming, contextual learning is not possible. Contextual learning describes a learning process, where emotions and cognitions can be handled and integrated at the same time - as it is also supposed to happen in the insight-process. A contra-example here are traumatic experiences, which are hallmarked by overwhelming negative emotions, explicitly fear, which allow a very short and intense memorization of the negative emotions in amygdalae and hippocampi, but are lacking a contextualization with explicit memories, space in time (Diamond et al., 2007; Ehring, 2019; Maddox et al., 2019). There are a few theories, like the emotional-processing theory by Edna Foa or the dual-representation theory by Chris Brewin, suggesting similar mechanisms of a one-sided emotion-only processing due to emotional overwhelming, which is ultimately thought to be the cause for intrusions (Brewin et al., 1996; Brewin & Burgess, 2014; Foa et al., 1989; Foa et al., 2006). That is, mid-size emotional arousal should be an optimal circumstance for creating *hot insight*. This u-shaped dependency of learning or performance on emotionality has already been formulated way back in 1908 by Yerkes & Dodson (1908) (i.e. best performance under mid-size arousal in difficult tasks), and is

known under the Yerkes-Dodson-Law (Broadhurst, 1957; Diamond et al., 2007). In our model, this is depicted by a sigmoid growth function with an inert onset, showing that only small intensities of negative emotions are not enough for facilitating insight. The steepest part of the graph reflects the highest potential for insight during mid-size emotions. The damped effect of E on I shows the decreasing benefit of overwhelming emotions in the insight process, as just mentioned (Schiepek et al., 2017). The importance of mid-size arousal for insight is already used and implemented in various interventions. For example, Greenberg (2015) suggests within his emotion focused approach a 70% arousal necessary for therapeutic change: "Emotional approach and awareness should be used when the emotions are below some manageable level of arousal, say 70%, but distraction and regulation should be applied when they exceed this level and become unmanageable" (Greenberg, 2015, p. 97).

Also, in exposition interventions, when using the gradual approach, a manageable level of emotions is pursued (Margraf & Schneider, 2009b). Furthermore, in confrontational traumatic therapies, like the already introduced imagery rescripting, a certain level of liveliness and emotionality is needed in order to see a progression in integration of trauma related memories (Ehring, 2019). This can be attained by a continuous assessment of the "subjective units of distress" during the rescripting (Ehring, 2019).

#### *3.5.1.2.3. Supporting Parameters: Therapeutic Alliance and Cognitive Competencies*

The insight process is massively supported by the therapeutic relationship. Engaging in painful material and negative emotions is an aversive endeavor (Hill et al., 2007). A therapeutic relationship acts like a 'safe base' in the sense of developmental theories (Bowlby, 1988), which provides a reliable environment that allows the patient to immerse in the self-referential process (Binder et al., 2009; Fisher et al., 2020; Schiepek et al., 2017; see Control-Master-Theory Silberschatz, 2013; Weiss, 1993). Gelso & Harbin (2007) describe the supporting act of the therapeutic relationship as follows:

> *It requires that the patient allow painful and at times frightening feelings and thoughts to come into awareness. Changing maladaptive patterns, too, is a daunting task, especially when these patterns are long-standing and durable. […] A strong therapeutic relationship provides support and encouragement for the patient to accomplish these tasks of insight and behavior change. By a strong therapeutic relationship, we mean a working alliance marked by sufficient trust, emotional connection, and collaborativeness. […] In attachment terms, the good therapeutic relationship provides the patient with a secure base and a safe haven as he or she seeks to try out new behaviors and give up old ones. (Gelso & Harbin, 2007, p. 303)*

Also, Grawe (2004b) outlines the importance of the therapeutic relationship and the therapist him/herself as a factor which facilitates a necessary depth of processing throughout the insight process:

> *The achievement of a high processing depth on the side of the patient does not happen by itself but is largely dependent on the therapist's behavior. A deepening of the depth of processing can be facilitated by appropriate statements from the therapist that stimulate the patient to work more deeply, but superficial statements can also prevent this. The therapeutic outcome benefits most when the therapist relates to the core of what the patient wanted to express and when he simultaneously stimulates the patient with his answer to explore this more deeply, and if the patient is sensitive to the therapeutic offers, by reacting to it with a deepening of his processing.(Grawe, 2004b, p. 66)*

Moreover, the cognitive competencies of a person are also very important and can influence the insight process. Latter is also referred to as a self-referential process, which includes self-related cognitions, self-control, self-reflections etc., which are mainly driven by cognitive competencies like mentalization and emotion regulation (as already outlined in chapter Parameter c - Cognitive Competencies (p. 108) ; Bateman & Fonagy, 2013; Garfield, 1990; Orlinsky et al., 2004). These competencies help to *contain* the appropriate level of negative emotions, without being untimely overwhelmed or consistently suppressing them. In other words, they help to keep the self-referential aspect present, connecting the moment-to-moment experiences and emotions with self-related cognitions and ultimately altering self-perception (Bateman & Fonagy, 2013; Greenberg et al., 2019; Orlinsky et al., 2004). A lack of activation of those competencies is associated with a less successful treatment outcome (Bateman & Fonagy, 2015; Dimaggio et al., 2013; Orlinsky et al., 2004; Wirtz et al., 2014).

There probably might be even an interaction between the therapeutic relationship and cognitive competencies in the emotion-insight process. A bearing therapeutic alliance fosters feelings of control in the patient and with that, lower the fear of overwhelming emotions (Silberschatz, 2013). This is known as *containing* in psychodynamic literature: a process, when the therapist and the therapeutic relationship help to withstand emotions, which could not be sustained by the patient on him/herself alone - at the moment (Mertens, 2022). A good therapeutic alliance also promotes the activation of cognitive competencies and the usage of more functional emotion-related coping strategies (Barkham et al., 2021; Grawe, 2004b; McCarthy et al., 2017; Orlinsky et al., 2004; Sugiura & Sugiura, 2015).

Taken together, there is diverse evidence of different research fields and conceptualizations which support the relation E → I. We would recommend to keep the function in the model.

### 3.5.1.3. Function E → P

| Theory | Reference |
|---|---|
| interlacing negative emotions and symptom severity | (Borsboom & Cramer, 2013; Shin et al., 2022) |
| negative emotions and symptom burden | (Cuijpers, 2020; Hennemann et al., 2023) |
| attenuating effect of positive emotions on symptom severity | (Forbes et al., 2012; Larsen, 2009) |
| **mediating parameters** | |
| cognitive competencies c | |

***Table 14:*** *Theoretical concepts related to E → P.*

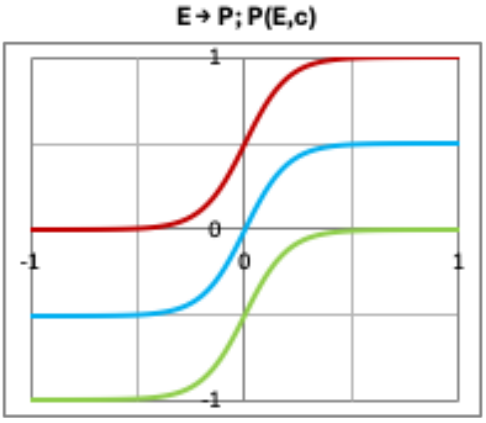



***Figure 10:*** *Graph of the function E → P (x-axis: input, y-axis: output).*

The function E → P delineates the effect of negative emotions (E > 0), like worry, fear, anger or grief, on the experience of symptom burden or problem intensity (P). Conversely, the function also includes the reducing effect of positive emotions (E < 0), like happiness or joy, on the experienced intensity of problems or conflicts (P) (Schiepek et al., 2017). **Figure 10** (p. 145) depicts the graph of the function. This relation is moderated by the person's ability to regulate his/her emotions, capacities of self-reflection and mentalization (parameter c), because moderating E → P involves modulation and/or regulation of emotions. Technically speaking, is the function E → P a logistic growth function, with c determining the steepness and the vertical position of the function. I.e. the less one' emotion regulation (c) is, the more intense is the effect of emotions on problem intensity. Even slightly negative emotions contribute to an elevated symptom burden. Conversely, the better emotion regulation is, the less impact negative emotions have on experienced strain, slightly negative emotions might be even transformed to have a reducing effect on problem intensity and positive emotions can even more be used to reduce problems and conflicts (Schiepek et al., 2017). The model uses a sigmoid growth function with a damped effect of emotions on problem intensity at very negative and very positive emotions, as this reflects the phenomenon of many

modalities of perception: extreme inputs have less impact and can be distinguished less than smaller inputs (Spering & Schmidt, 2012, see also Weber-Fechner-Law). **Table 14** (p. 145) summarizes the theoretical concepts related to E → P.

#### *3.5.1.3.1. Clarification Between Symptom Burden vs. Emotions*

Before diving deeper into the relation between symptoms of psychological stress/strain and emotions, it is useful to get the distinction between both clear. For the variable P (problem intensity), there is in German a very suitable word called 'Leidensdruck', which is hard to find an English pendant for. Word for word it could be translated as *pressure of suffering*. This might give the impression that problem intensity does not just cover the amount or intensity of some conflict. It is rather the overall suffering because of all the different problems, conflicts and strains. The closest translation to English is probably symptom burden. Symptom burden is also not just negative emotions, it is more the suffering emerging from many symptoms, limitations, cutbacks and also negative emotions. Cleeland (2007) specifies this further:

> *The impact of these multiple symptoms upon the patient can be described as "symptom burden," a concept that encompasses both the severity of the symptoms and the patient's perception of the impact of the symptoms. (Cleeland, 2007, p. 15)*

An important aspect here is the patient's perception. Hence, not only the symptoms themselves, as specified in the DSM or ICD (e.g. 'diminished interest in activities"' (World Health Organization, 2023)), but what they mean in all their complexity and interaction with the patients make the symptom burden. The meaning-characteristic of symptom burden also clarifies the dependency of E → P on emotion regulation capacities (c). Interpreting, ascribing significance, and maybe reframing symptoms, such as negative emotions, are core cognitive competencies.

But as often in psychotherapy research, big concepts like symptom burden are hard to be investigated as a whole, and due to the lack of integrating and overarching theories, there is little research examining the trans-theoretical and trans-diagnostic aspects of such concepts. Therefore, we will outline a few studies, which use specific disorders, often with a somatic component, as an indicator of the symptom burden (P), besides emotions (E) and emotion regulation (c) as additional variables. Most research can be found with studies using a somatic characterized disorder, e.g. irritated bowel syndrome, as a symptom burden measurement, because these disorders allow more physical correlates to be assessed and

compared to "more psychological" correlated, like moods and emotions. Whereas in "pure" emotional disorders - although we know they are unnecessary, e.g. somatizing depression - the differentiation between emotions as a driver of the symptom burden and as an indicator for a symptom burden is more blurred. This does not make the relation E → P less valid, but harder to investigate.

#### *3.5.1.3.2. Negative Affect and Symptom Severity*

However, also or even especially anxiety disorders and depression are an excellent example to picture the close relation between emotions and symptom burden, as the negative emotions are even a diagnostic criterium in these disorders (Schiepek et al., 2017; Shin et al., 2022). One could argue, that these conglomerated negative emotions, affects and mood states become the disorders, as suggested by the network theorists (Borsboom & Cramer, 2013). Apart from the disorders where emotions and symptom severity are very interlaced, there are some studies examining the relation between emotions, emotion dynamics and symptom burden.

**Negative Affect and Symptom Burden**

Hennemann et al. (2023) conducted an interesting study analyzing the effect of positive and negative emotions, assessed via a seven-day EMA, on symptom burden, measured with self-constructed items (six time points a day, smartphone based). The study included 22 patients with somatic symptom disorder and 20 healthy controls. A time-lagged analysis showed that negative affect predicted somatic symptom burden across groups (t-1 predicted t). Although the sample size of this study was not quite big, the study design and findings are highly relevant. First, the authors used partly self-constructed items to assess the problem intensity. This has to be shown to be more suitable for assessing therapeutic change than standardized symptom checklists and, in this case (Cuijpers, 2020; Schiepek et al., 2016). This context makes it clear, that especially in somatic symptom disorders, which have massively varying symptom spectrum, individualized items capture way better what a patient's burden is. Second, the variables are based on a time dependent assessment (EMA), which allows better causal analysis. In this case, it has been shown that negative emotions precede and hence *predict* the somatic symptom burden. This is exactly what our model displays within the function E → P. Another study, assessing reported physical symptoms in a group of high/low habitual symptom reporter and the impact of negative emotions, found that more bodily symptoms are reported when more unpleasant stimuli (as an

induction for unpleasant emotions) processed (Constantinou et al., 2013, N = 45). This is another prototypical example for the symptom intensifying effect of negative emotions. The authors suggest that the possible connecting mechanism between emotionality and symptom experience is a specific memory activation:

> *These findings show an interactive effect of unpleasantness and high arousal on elevated symptom reporting in high habitual symptom reporters, suggesting that different characteristics of emotional cues contribute to a somatic memory activation process leading to the experience of elevated symptoms. (Constantinou et al., 2013, p. 191)*

Lee et al. (2020) examined the relation between physical symptoms, like shortness of breath in heart failure patients, on depressive symptoms (reflecting positive and negative affect in this case) in a 15-day EMA study (N = 52). Results were vague, but showed that elevated levels of depressive symptoms influence the experience of perceived symptom severity differently than in the group of low-level depressive symptoms. Another study by Maher-Edwards et al. (2011) showed a correlation between negative emotions and symptom severity in patients with chronic fatigue syndrome. The authors underlined the importance of meta-cognitions on this relation, but as the study was purely correlative, the moderating effect remains unclear. However, the paragraph about the role of c on the relation E → P will examine this further.

However, it has to be considered that the body of research is still quite small and the findings are inconsistent and some factors like gender-differences or type of symptoms seem to impact the relation between negative emotions and problem intensity (e.g. Van Diest et al., 2005).

**Instability of Negative Affect and Symptom Burden**

Furthermore, some studies show, that not only the absolute levels of negative affect are related to problem severity, but that the instability of the negative affect is associated with baseline symptoms (Lavender et al., 2013), can predict the symptom burden (e.g. Bosley et al., 2019) as well as later negative symptoms (Wichers et al., 2010) and treatment response (Husen et al., 2016).

**Negative Affect, Symptom Burden and Emotion Regulation**

As already mentioned above, a few studies also found the moderating effect of cognitive competencies (c) on the relation between emotions and symptom burden. Maher-Edwards

et al. (2011) for example, discussed the potential moderating effect of meta cognitions (as an emotion-regulation like strategy, i.e. c) on the correlation between negative emotions and symptom severity in patients with chronic fatigue syndrome. However, the correlational design of the study did not allow for any further conclusions. Kirwan et al. (2017) showed that emotion regulation moderated the effect of anxiety on insomnia, in a mixed sample of healthy controls and people with sleeping difficulties (above cutoff score of an insomnia-self-report scale; N = 468 with 136 insomnia participants). Higher levels of anxiety, due to a lack of emotion regulation competencies, led to an increase in insomnia severity. This matches exactly the hypothesized relation of the function E → P: higher levels of negative emotions (here: anxiety) lead to a higher symptom burden (here: insomnia), moderated by the amount of cognitive competencies (here: emotion regulation). Also, in a clinical sample of a patient with major depression, the effect was found: an increase of emotion regulation capacity led to lower levels of depression though the increased ability of tolerating and modifying negative emotions (Radkovsky et al., 2014). Furthermore, Heller et al. (2013) showed an increased activity in the areas of the prefrontal cortex (especially Brodman Areal 10 and dorsolateral PFC), using a fMRI, in a sample of patients with major depression, while regulation negative affect. The increase in activity in those PFC areas correlated with the changes in depression severity over six months. Emotion regulation is associated especially with the PFC.

Especially the toleration of negative emotions is known from the approach used in the Acceptance- and Commitment Therapy (ACT). One of the important principles of ACT is to practice the acceptance of negative emotions, as there are also parts of life (Dixon et al., 2023; Hayes et al., 2014). This is basically a way of emotion regulation: encountering positive and negative emotions with *affective openness* as an emotion regulation strategy (parameter c), prohibit the onset of further vicious cycles including negative secondary emotions, avoidance etc. conglomerating finally to increased experience of problem intensity (Dixon et al., 2023).

Summed up, the moderating effect of cognitive competencies, especially emotion regulation, on the relation between emotions and problem severity is supported by some research and is already implemented into therapeutic approaches like ACT.

#### *3.5.1.3.3. Positive Affect/Emotions and Symptom Severity*

Besides the effect of negative emotions on increased symptom burden, the model also assumes an attenuating effect of positive emotions on perceived symptom severity. Most of the research in this area is devoted to the effect of positive emotions on well-being and quality of life, less on decreased problem intensity. However, several studies analyzed the effects of emotions on symptom severity, using the relation between positive and negative effect (PA/NA ratio), i.e. displaying the amount or increase of positive emotions, dependent on the amount of negative affect. The studies examined the relation between absolute values of negative affect, the PA/NA ratio, and symptom reductions (Forbes et al., 2012; Howard et al., 1993; Larsen, 2009). The different authors conclude that a higher PA/NA ratio (i.e. more positive than negative affect prevalent) is an indicator for emotional well-being, self-efficacy and higher levels of optimism. This is hypothesized to "increase patients' abilities to make use of therapeutic interventions already early in treatment" (Husen et al., 2016, p. 306).

These findings are in line with the assumptions of our model, that positive emotions decrease the symptom burden. Based on the findings, we would recommend to keep the function in the model.

### 3.5.1.4. Function E → S

| Theory | Reference |
|---|---|
| positive emotions as an indicator of a good satisfaction of needs | (Grawe, 2004b) |
| broaden and build hypothesis | (Fredrickson, 2000) |
| meta-therapeutic processing | (Fosha et al., 2019) |
| nourishing aspect of positive emotions | (Fitzpatrick & Stalikas, 2008a) |
| subjective well-being research | (Diener, 2000; Ryan & Deci, 2001; Seligman & Csikszentmihalyi, 2000) |
| usage of positive emotions in CBT interventions | (Margraf & Schneider, 2018b) |
| **mediating parameters** | |
| cognitive competencies c | |
| motivation as trait m | |

***Table 15:*** *Theoretical concepts related to E → S.*

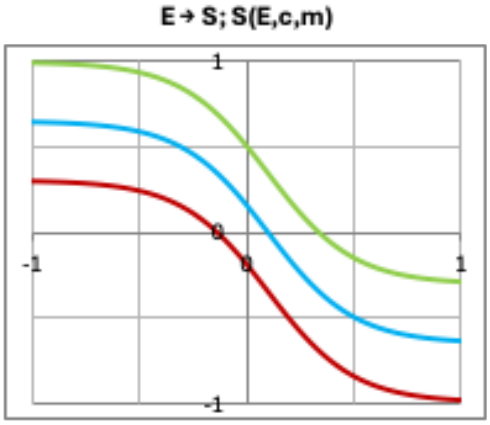



***Figure 11:*** *Graph of the function E → S (x-axis: input, y-axis: output).*

The function E → S describes the effect of experiencing positive emotions on the feeling of therapeutic progress. Positive emotions contribute to the sense of success and enhanced feelings of progress. In turn, negative emotions like grief, shame or anger discourage and reduce those feelings of progress and successful problem solving, as they also tend to activate contrary feelings to progress, like problem intensity and symptom severity (see FUNCTION E → P (P. 145)). However, small to medium degrees of negative emotions can still facilitate the therapeutic process, as already outlined in FUNCTION E → I (P. 139). (p. 1) Because distressing emotions are needed within the therapeutic course, e.g. when confronting the patient with personal conflicts, working on suppressed negative emotions or traumata etc. (Schiepek et al., 2017).

Within our model, the reducing effect of negative emotions on success is displayed with an inverse logistic function, where positive to moderate negative emotions are related to high levels of success. Negative emotions (E > 0) are associated with low levels of success. The steepest gradient is settled at a range of medium emotional intensity. Cognitive competencies (c) and motivation as trait (m) have a mediating role here, as higher levels of those reduce the dampening impact of distressing emotions on success. **Table 15** (p. 150) summarizes the theoretical concepts related to E → S. **Figure 11** (p. 151) represents the graph of the function.

#### *3.5.1.4.1. Positive Emotions as an Indicator for a Good Satisfaction of Needs*

As already outlined in chapter VARIABLE S - SUCCESS (P. 94), the feeling of success tunes in or goes along with a better satisfaction of needs, according to Grawe's consistency theory (Grawe, 2004b). When now looking closer to this mechanism, positive emotions can be seen as the initial indicator for the successful satisfaction of a need. Grawe suggests "they [emotions] appraise the present relationship of the individual to his/her environment regarding fulfillment or endangerment of innate needs" (Grawe, 2004b, p. 232). Inversely, negative emotions reflect a state of *incongruence*, where needs are not sufficiently met (Grawe, 2004b; Rogers, 1957), hence are contrary to the feeling of therapeutic progress.

Taken together, based on Grawe's consistency theory, the relation E → S seems plausible. Positive emotions are indicators of a better satisfaction of needs, which in turn facilitates the feeling of therapeutic progress. Inversely, distressing emotions are a sign for insufficiently satisfied needs, which reduces the feeling of successful problem solving and therapy success.

#### *3.5.1.4.2. Positive Emotions as a Nourishing Soil and Driver for Therapeutic Change*

In order to investigate the facilitating effect of (positive) emotions on feelings of progress further, the already introduced broaden-and-build (BaB) hypothesis by Fredrickson (2000) is included (see chapter VARIABLE E - EMOTION (P. 76)). The BaB theory assumes that positive emotions widen the scope and generate a state that makes it possible to develop and thrive. Negative emotions narrow the horizon to keep an individual problem-focused (Fredrickson, 2004). That means emotions do not just influence the state of well-being and the confidence in a successful therapy course. According to the BaB theory, positive emotions are the necessary base, a nourishing soil, which are required for a change for the good and that facilitate that. Some authors already applied the conclusions of the BaB theory to the therapeutic process. For example, describes Fosha et al. (2019) the therapeutic technique of *meta-therapeutic processing*, which is basically an implementation of the BaB theory in the therapeutic context. The authors describe an upward spiral of positive emotions: on a neurological level, the processing is more located to the right insula and positive emotions are rather energy-enriching, compared to negative emotions (Craig, 2015; Damasio, 2018; Panksepp, 2010; Porges, 2007). On a psychological level, positive emotions are broadening the scope and widening the perspective, as hypothesized by the BaB hypothesis. This widening effect of pleasant emotions is used within this therapeutic principle to enhance an upward spiral of feeling better, widening the focus, implementing new behaviors, insights, etc. (Fosha et al., 2019). Hence, positive emotions are not just a 'nice-to-have' secondary effect, but become major drivers for the change process. A similar mechanism is suggested by Fitzpatrick & Stalikas (2008a). They focused on the intersection of positive psychology and psychotherapy and introduced two axes to describe the different aspects of positive emotions within psychotherapy. The axes are "emotional experience — whether something feels good or bad to the client — and therapeutic value — how helpful the emotion is to the therapeutic process" (Fitzpatrick & Stalikas, 2008a, p. 250).

The axis led to four quadrants, with one of them being positive experiences by the client and positive value for the therapeutic process. They claim that this is one of the most underrated and under-researched area of psychotherapy. Fitzpatrick & Stalikas (2008a) also embed their hypothesis (i.e. nourishing aspect of positive emotions) within the framework of the BaB theory and conclude - similar to Fosha et al. (2019) - that positive emotions are not only indicators, but major drivers of therapeutic change. The authors suggest a few mechanisms of work, which are triggered by pleasant emotions, some of them being enhancement of self-efficacy, interest and curiosity to reinforce the view of a brighter future, calmness to consolidate therapeutic gains in success (Fitzpatrick & Stalikas, 2008a). These mechanisms, especially the last one, match directly with the assumption in our model that positive emotions lead to an increased experience of therapeutic progress. Further, Fitzpatrick & Stalikas (2008a) outline in more detail how positive emotions could influence the feeling of progress in psychotherapy. W. B. Walsh (2003) and Stalikas et al. (2015) give an overview of therapeutic approaches, which integrate the BaB hypothesis, in line with our assumption of $E \rightarrow S$, e.g. accelerated experiential dynamic psychotherapy by Fosha et al. (2019), Emotions focused therapy by Greenberg (2004) and the goal focused positive psychology by Winter Plumb et al. (2019).

#### *3.5.1.4.3. Positive Emotions and Success in the Perspective of Happiness & Subjective Well-Being Research*

Besides the BaB hypothesis, the biggest area of research regarding positive emotions is the field of happiness and subjective well-being research (Diener, 2000; Ryan & Deci, 2001; Seligman & Csikszentmihalyi, 2000). Positive emotions are seen as a "catalyst to health states [… and as a ] capacity of deep emotional experience to mobilize antistress and disease resistant function" (Ryan & Deci, 2001, p. 151). There is some research in this area around Sonja Lyubomirsky suggesting that happiness is not only a byproduct or effect of success, but precedes success and ultimately even leads to success (Lyubomirsky et al., 2005). Happiness, in this case, is close to positive emotions ($E < 0$) within our framework. In a meta-analytic overview, the authors conclude:

> *That happiness is associated with and precedes many successful outcomes, as well as behaviors paralleling success. Furthermore, the evidence suggests that positive affect—the hallmark of well-being—may be the cause of many of the desirable characteristics, resources, and successes correlated with happiness. (Lyubomirsky et al., 2005, p. 803)*

However, the results keep being ambiguous and there is no more recent updated or newly conducted met analysis to date, as far as we know. Several studies indicate partly that happiness might precede success at the workplace (L. C. Walsh et al., 2018), or work as a moderator for school achievement (Weber et al., 2016). But similar to Lyubomirsky et al. (2005) already indicated, many of the data is correlational and not exclusively interpretable in favor of E → S, but could also support S → E (Bücker et al., 2018).

#### *3.5.1.4.4. Usage of Positive Emotions in CBT Interventions & Psychotherapy*

Going back from general subjective well-being to a more psychotherapy focused field. In cognitive-behavioral therapy (CBT), positive emotions are utilized in many ways as hallmarks and facilitators for perceiving and generating therapeutic progress (Margraf & Schneider, 2009b). For example, hypothesizes the famous depression model by Lewinsohn (1975), that because of a lack of positive experiences general dysphoria and a feeling of stagnation develop, ultimately leading to a depression (Wittchen & Hoyer, 2011). Fitting to this framework, behavioral activation developed as a central intervention in CBT (Margraf & Schneider, 2009b; Margraf & Schneider, 2018b; Wittchen & Hoyer, 2011). The idea is to introduce positive experiences through behavioral tasks back into people's lives in order to evoke feelings of efficacy, success, and progress. This corresponds very well to the relation E → S.

Furthermore, there are many findings regarding the effect of positive emotions in - not exclusively CBT - psychotherapy and mental disorders. For example, are positive emotions assumed to predict therapeutic change in the short and long-term, independently of a decrease in negative emotions (McNeil & Repetti, 2022). However, it is difficult to find explicit studies regarding the effect of emotions on the feeling of therapeutic progress, due to many overlapping concepts. Especially the already introduced concept of subjective well-being (SWB) often interferes, i.e. positive emotions have been shown to improve well-being in depressed patients, reduce symptoms and have a general preventive character (V. Santos et al., 2013; S. Walsh et al., 2017). But due to the manifoldness of the definitions of SWB used in the different studies and meta-analysis, the effects of pleasant emotions on SWB cannot be explicitly interpreted as effects for experiencing (therapeutic) progress or success, because SWB and success are not overlapping to 100%. One of the few studies, allowing more unambiguous conclusions, was conducted by Westwood (2016). They used transcriptions of therapy sessions in order to examine the use of positive emotions during

the therapy process. They extracted different themes of usage, with one of them being 'trusting the process and seeing where it leads', which comes very close to the experience of and trust in therapeutic progress as we defined it in our model (S). Yet it must be said that the study only assessed three therapist-patient dyads, which limits the reliability and generalizability massively.

Taken together, there are many findings supporting the effect of positive emotions on therapeutic progress. But due to the manifoldness of the different approaches of assessing 'progress', a certain precariousness remains in the interpretation.

#### *3.5.1.4.5. The Role of Cognitive Competencies and Motivation as Trait*

As already brought up, do mild to even moderate negative emotions, not minder the feeling of therapeutic progress, depending on the available cognitive competencies. Implementing this delay of effect is displaying an important feature of psychotherapy. Because negative emotions are central to the therapeutic process and for therapeutic progress, as for example already mentioned during the process of insight (see chapter Function E → I (p. 139)) (for example Greenberg, 2004). Distressing emotions can be expected to occur during psychotherapy, due to confrontation with trauma, anxiety and to date avoided situations, emotions or thoughts, working on personal conflicts, or other stressful experiences. To which extent these effects alter the feeling of progress depends on the cognitive competencies (c). If one has a high capacity of c, negative emotions can be better experienced without drifting into dysfunctional patterns or downwards spirals, affecting the overall feeling of progress. The probability of applying functional emotion regulation strategies is also higher (Gross, 2015; Schiepek et al., 2017).

Another variable assumed to affect the relation E → S is the parameter m, motivation as trait. A general hopefulness and belief in success is associated with enhanced feelings of success from day to day, as also hypothesized by the *model of positive psychotherapy* (see S. Walsh et al., 2017 for a more detailed outline). This is self-evident, as people with a higher trait-motivation experience higher levels of self-efficacy within the therapeutic process, have a higher probability for better outcomes and have a general approach tendency, which fosters again positive emotions and feelings of efficacy and success (Wampold et al., 2018; e.g. Lambert, 2004; Scheffer & Heckhausen, 2018) (for a more detailed outline of the effects of trait motivation on therapy, see chapter Parameter m - Motivation to Change as Trait (p. 124)).

#### *3.5.1.4.6. Potential Role of the Therapeutic Alliance*

The therapeutic alliance is not yet included in our model to influence the relation E → S. However, there is some evidence pointing to the possible fostering role of alliance on the feeling of success (Fitzpatrick & Stalikas, 2008b; Fosha et al., 2019; Greenberg, 2015; Winter Plumb et al., 2019). Those models share the assumption, that alliance can act on the feeling of success on two ways: first, it can be seen as a compensatory capacity for low levels of c, i.e. similar as already outlined in chapter ATTACHMENT & ALLIANCE AND THERAPY (P. 103) and PARALLELISM TO DEVELOPMENTAL THEORIES (P. 109), the alliance can help patients to better handle negative emotions in terms of withstanding distressing emotions (concept of containing) (Mertens, 2022), applying functional emotion regulation strategies (Orlinsky et al., 2004) and mitigate negative emotions or the effect thereof. Second, the therapist can help to emphasize pleasant emotions and tentative feelings of success and progress, which might founder within the predominantly distressing symptomatology in some disorders. Fitzpatrick & Stalikas (2008b) elaborate further on this while connecting the assumption to the BaB hypothesis:

> *If the alliance is an experience of positive emotions, then the alliance should relate to broadening and building. Resources that are built should undo some of the effects of negative emotions experienced by clients so that the alliance continually feeds the spiral of progress. This explanation of the potency of the therapeutic alliance demonstrates how the upward spiral may open alternative ways to interpret existing research findings. (Fitzpatrick & Stalikas, 2008b, p. 148)*

Summing up, it should be deliberated about including an effect of the therapeutic alliance on the role of emotions on the feeling of therapeutic progress in future versions of this model. Based on the findings, we would recommend to keep the function E → S in the model.

### 3.5.1.5. Open for Discussion: Function E → M

The effect of emotions on motivation is not yet included in the model. At first sight it might seem a plausible and reasonable relation. Emotions and motivation are in a complex interaction, which is hard to detangle (Harmon-Jones, 2019; Tretter & Löffler-Stastka, 2018). Some suggest further interfering processes in this interaction, like attention (Raymond, 2009) or executive control (Pessoa, 2009). Most theories are based on the assumption that emotions are a rudimentary motivational system, which is based on the approach-avoidance distinction (Scheffer & Heckhausen, 2018; Wasserman & Wasserman, 2020). Wasserman & Wasserman (2020) describe motivation as a refined emotional system:

> *It also implies that the basis of the advanced human construct of motivation is the primary emotional network of the human brain interacting with behavioral action networks to produce what we call motivation. This implies two interrelated but distinct processes. We should also be aware that there is research that views the primary behavioral survival reactions as the basis of all higher order cognition (Koziol, Budding, & Chidekel, 2012). That would make all motivation-related cognitions and behavior the progeny of these primary human survival mechanisms. (Wasserman & Wasserman, 2020, p. 89)*

This implies that almost every higher-order process is a product, or at least based on this rudimentary emotion-system. Scheffer & Heckhausen (2018) introduces a more direct relation between emotion and motivation:

> *The very anticipation of emotions such as joy or love can thus be motivating, even when they are not associated with the motive momentarily aroused. […] Emotions are thus prerational forms of values and expectancies that influence the motivational process. (Scheffer & Heckhausen, 2018, p. 88)*

In both cases, emotions are defined as a kind of "input" to higher or further motivational processes or as drivers for motivation (Lang & Davis, 2006), but no precise assumption of the relation is made.

When investigating the findings of neuropsychology, the inextricability of emotion and motivation gets even more obvious. Both are based on similar, massively overlapping motivational circles (Cromwell et al., 2020; Lang & Bradley, 2010). Cromwell et al. (2020) emphasizes, that motivation and emotion have been treated as two distinct strings in research, which have been separated for years, although they share many similarities and depend highly on each other (Beall & Tracy, 2017). However, to date:

> *The theoretical view shared among the investigators is that expressed emotions are founded on motivational circuits in the brain that developed early in evolutionary history to ensure the survival of individuals and their progeny. (Lang & Bradley, 2010, p. 437)*

In a recent review, Cromwell et al. (2020) summarize that similar neuronal circuits and areas are activated within motivational and emotional processes. Though, this is not a proof of an inevitable dependency. The authors conclude that:

> *The answer to the question of whether emotion and motivation interact is a resounding yes, and more and more evidence from multiple levels suggest that these processes are so tightly woven together that they are inseparable. (Cromwell et al., 2020, p. 220)*

Nevertheless, also on a neuropsychological level, more research is needed to investigate the nature of the interaction of both constructs.

After looking into psychological and neuropsychological research, a small leap is taken into psychotherapeutic theories regarding the relation of emotion and motivation. In Grawe's often cited theory of *Psychological Therapy*, he made a suggestion of the role of emotions in the motivational processes. Based on the Rubicon-Model by Heckhausen et al. (2013), he connotes emotions as motivators and energizers of certain behaviors (Grawe, 2004a). As also already mentioned several times in this work, emotions within Grawe's framework might be seen as indicators for the degree of satisfaction of needs, hence are indicators if something should be continued or stopped, or as one should remain, fight or flight in a situation (Grawe, 2004a). Beall & Tracy (2017) introduces a theory connecting motivation and emotion, based on the theoretical work of Kenrick and Maslow's *Hierarchy of Needs*. Within this framework, six distinct emotions are connected with six distinct motivational systems, which are based on the needs introduced by Maslow. The authors elaborate further on the interaction between emotion and motivation: "that distinct emotions are what motivate behavior, and that these emotions may have evolved in tandem with fundamental motivational systems because they play a critical role in the functioning of those systems" (Beall & Tracy, 2017, p. 1).

Similar to the ideas of emotions as rudimentary motivational systems and shared neurological circuits, emotions are suggested to be a part of further and higher motivational processes across different theories. Especially self-related emotions seem to be closely linked to motives and motivation, although the link between the two concepts is fairly examined (Leary, 2007).

Summarizing the findings, the inextricability of emotion and motivation runs like a common thread through psychological, neuropsychological, and psychotherapeutic theories. However, the possible ways of interaction remain unclear and can be multiple: negative emotions can be thought to be an indicator of an insufficient satisfaction of needs and hence increase the motivation to change something (E- → M+). At the same time, negative emotions could have a narrowing, depressing effect, leading to a loss of hope and resignation and ultimately a reduction in motivation (E- → M-). On the other hand, positive emotions could widen the scope and activate approach motivation, as suggested by the Broaden and Build Hypothesis (E+ → M+). But positive emotions might also be an indicator of sufficient need satisfaction and with that signal the individual to sustain the current situation and change nothing (E+ → M-). In conclusion, despite many findings of the overlap and interconnectedness of emotion and motivation, the clear nature of the interaction remains

unclear. There are not enough findings to make explicit and helpful assumptions about the relation, which could have additional value for the model and its predictions of the therapeutic process. Based on current findings, we would suggest to not include the function E → M in following versions of the model, due to the ambiguity of the relation.

### *3.5.2. Functions of I - Insight*

The variable I, encompassing the process of insight within the therapeutic process, is assumed to interact with the variable E (emotions) and S (success) in a way that insight facilitates negative emotions and a feeling of success. These functions are influenced mainly by the parameters of behavioral competencies (r), cognitive competencies (in the case of I → E), therapeutic relationship and motivation as trait (in the case of I → S). The potential relation of insight with the other variables (P, M, I) is discussed.

#### 3.5.2.1. Function I → E

| Theory | Reference |
|---|---|
| confronting negative emotions leads to a relief and increase in positive emotions | (Gelso & Harbin, 2007) |
| flooding | (Hautzinger & Linden, 2015) |
| confrontational trauma treatments (rescripting, etc.) | (Ehring, 2019) |
| emotion focused therapies | (Barkham et al., 2021; Greenberg, 2015) |
| psychodynamic theories: relief after confronting suppressed conflicts | (Kriz, 2014; Slunecko, 2017) |
| **mediating factors** | |
| cognitive competencies c | |
| behavioral resources r | |

***Table 16:*** *Theoretical concepts related to I → E.*

As already compiled in chapter VARIABLE I - INSIGHT (P. 88), the process of insight requires looking into unpleasant and usually to date avoided material like emotions, memories, cognitions and behavioral patterns of oneself. The role of (negative) emotions in the insight-process could be called two-folded. Although, two-folded might be even too much of a

simplification of the connection between negative emotions and the insight process. It is more tightly interwoven like a chicken-egg conception, with no end and beginning. On one hand, negative material is necessary to initiate and develop the insight process (see FUNCTION E → I (P. 139)), on the other hand does the insight process evoke and intensify negative emotions - at least in the short term (Grawe, 2000; Hill et al., 2007). **Table 16** (p. 159) summarizes the theoretical concepts related to I → E. **Figure 12** (p. 162) represents the graph of the function.

#### *3.5.2.1.1. Theoretical Considerations*

How can the intensification of negative emotions through the insight process be explained, though? The basal assumption is that the negative stimuli (emotions, traumatic experiences, phobia) have been avoided by the patient up to therapy, which causes distress and symptoms. Throughout the therapy, and especially the insight process, those avoided contents are confronted. This engagement leads to an intensification of negative emotions in the first place, due to the unpleasant nature of the material and an exposition of it in its full size - or at least a size it has never been exposed before. Gelso & Harbin (2007) characterize it:

> *Gaining integrative insight into feelings and thoughts that were previously hidden from awareness is a daunting task. It requires that the patient allow painful and at times frightening feelings and thoughts to come into awareness. Changing maladaptive patterns, too, is a daunting task, especially when these patterns are long-standing and durable. (Gelso & Harbin, 2007, p. 303)*

Established interventions make use of this mechanism: for example, exposition therapy leads to a massive increase in negative emotions throughout the confrontation, e.g. when a phobic patient is confronted with a spider on his/her hand, fear, disgust etc., reach their high. The negative emotions are not a side effect, but *the* mechanism of action (Hautzinger & Linden, 2015, see flooding). Also, in confrontational trauma treatments, an increase of negative emotions is aimed at and occurs when rescripting the *hot spots* of traumatic memories (Alpert et al., 2021; Ehring, 2019). Later, after working with those avoided events, memories etc., relief, decrease of fear, increase in self-efficacy and another internal organizational quality should arise. Hence, after the short-term increase of negative emotions, the insight process with its confrontations should lead to an increase of positive and decrease of negative emotions (Fitzpatrick & Stalikas, 2008b). Also, theoretical approaches describe the process of initial emotional deterioration throughout the insight process. For example, a guiding principle in experiential focused therapies is to *follow the pain* (Böcker, 2018; Greenberg, 2015; S. Johnson et al., 2023). Hence, an increase of negative emotions

is aimed for, because it is necessary and unavoidable when exposing and elaborating painful material, which in turn is necessary for the insight process. In their review, Barkham et al. (2021) showed that an increase in negative emotions during the therapeutic process is associated with a positive outcome (Auszra et al., 2013; Herrmann et al., 2016). This can be seen as evidence for the short-term increase of negative emotions during insightful processes, although the insight process itself was formulated as such in those studies. Also, in their meta-analysis, Jennissen et al. (2018) conclude that insight is an important factor of the therapeutic process, which is "painful at first" (Jennissen et al., 2018, p. 966). Fitzpatrick & Stalikas (2008b) even describe insight as a trigger for long-term positive emotions and emotional relief. Various other concepts mention the mechanism of increased negative emotions throughout the insight process, leading to emotional relief (see Grawe, 2004b; Horowitz, 1987; Mergenthaler, 1996; Silberschatz, 2009), which have already been outlined in FUNCTION E → I (P. 139). However, the probably oldest and most known concept making use of the mechanism is the idea of *suppressed conflicts* by psychodynamic theories, rooting back to the early psychoanalysis by Sigmund Freud (Kriz, 2014; Slunecko, 2017). Through various techniques, like engaging in dreams, free association, or regression, it is thought to bring unconscious (suppressed) conflicts into consciousness in order to process them. This process of becoming aware of those conflicts is presumable unpleasant and accompanied by an increase in negative emotions (Rudolf et al., 2013).

More generally speaking, the assumptions about the role of emotions in the insight process are based upon is the 'look-into-the-abyss'-concept. It describes the idea that in order to overcome psychological difficulties, trauma or anxiety, one has to 'go through' as Osho suggested (I. Portal, personal communication, 25. August 2023), i.e. really elaborate on the problem-related disregarded unpleasant material. Literally speaking, only after *going down into the abyss* one can come up again, proceed and shape one's path of life as desired. Besides general philosophical anecdotes, this idea roots back to the early concepts of *suppressed conflicts* in psychoanalysis, as already mentioned (Kriz, 2014; Slunecko, 2017).

#### *3.5.2.1.2. Nature of the Function*

The function I → E covering the emotion intensification effect during the insight process is a sigmoid growth function (see **Figure 12** (p. 162)). I.e. low levels of insight will produce only small amounts of negative emotions. An exponential increase in emotions arises at medium intensities of insight ('importance' of elaborated material). Followed by a damped effect at very high levels of insight, because negative emotions cannot increase indefinitely.

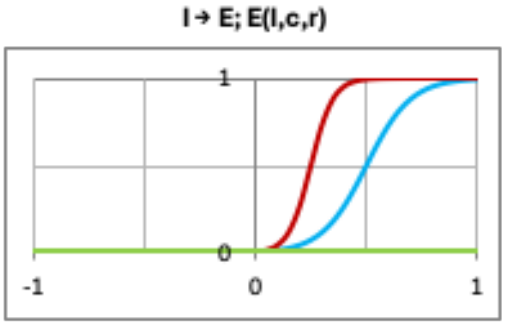



***Figure 12**: Graph of the function I → E (x-axis: input, y-axis: output).*

#### *3.5.2.1.3. Mediating factors c and r*

The relation between insight and emotions is mediated inversely by the parameters c (cognitive competencies) and r (behavioral skills). The less cognitive competencies and behavioral skills a person has, the more intense and maybe even uncontrollable emotions the insight process might trigger. Higher levels of emotion regulation and functional coping strategies will lead to a manageable increase in emotions (Gross, 2015). As this is a 'classical' emotion regulation process, which has already been outlined in this thesis, a more precise discussion can be found in the chapter Emotion Regulation (p. 111).

#### *3.5.2.1.4. Potential Role of the Therapeutic Alliance*

Up to date no further mediating parameter besides c and r is included in the function I → E. However, there are findings which may indicate a possible influence of the therapeutic relationship (a) on the function I → E. Similar to the function E → I, where a is already included, it could serve as a kind of external help for the patient's emotion regulation, in a sense of the already introduced concept of *containing* (see chapter Supporting Parameters: Therapeutic Alliance and Cognitive Competencies (p. 143)). That is, the alliance can help patients to better handle negative emotions in terms of withstanding distressing emotions (Mertens, 2022), applying functional emotion regulation strategies (Orlinsky et al., 2004) and mitigate negative emotions or the effect thereof (see also chapter Potential Role of the Therapeutic Alliance (p. 156)). Similar to the concept of *scaffolding* by Lev Vygotsky, a good alliance helps the patient withstand unpleasant, straining feelings and handle straining emotions functionally, which the patient could not have done it on his/her own yet.

On the other hand, the therapeutic alliance works as a facilitator to expose emotionally loaded and maybe even traumatic material, because it provides the necessary secure environment. Gori et al. (2015) describe the therapeutic alliance as a breeding ground for insight and associated unpleasant emotions:

> *In fact, psychotherapy may produce change because it promotes a secure environment where clients can learn to manage their anxiety, to face avoided material, to express negative emotions, and to reach insight (Greenberg and Safran, 1987). (Gori et al., 2015, p. 298; L. Greenberg & Safran, 1987)*

Moreover, the *control master theory* by (Silberschatz, 2013) elaborates further on the security providing feature of alliance (Binder et al., 2009; for an overview, see Silberschatz, 2013; Weiss, 1993).

However, definite conclusions about the role of the therapeutic alliance in the function I → E cannot be made, as empirical findings are mostly nonexistent. Nevertheless, do some theories imply a mediating role of a, in a similar fashion as c and r act, i.e. the better the alliance is, the less impactful and stressful are the negative emotions arising throughout the insight-process. Based on the current body of research, we would recommend to keep the function as a part of the model.

### 3.5.2.2. Function I → S

| Theory | Reference |
|---|---|
| increased feelings of mastery | (Connolly Gibbons & Crits-Christoph, 2021; Grawe, 2000; Jennissen et al., 2018) |
| contextual model of psychotherapy | (Wampold et al., 2018) |
| **mediating factors** | |
| motivation as trait m | |
| behavioral skills r | |
| therapeutic alliance a | |

***Table 17**: Theoretical concepts related to I → S.*

The function I → S describes the progress-enhancing effect of insight achievements. Not only does insight facilitate the feeling of progress, but it is also necessary for developing new qualities of problem-solving abilities, interpersonal relations or perspectives that lead to behavior change. Two ways of action are introduced, why insight might lead to the feeling of progress: evoking increased feeling of control and generating alternative explanations. **Table 17** (p. 164) summarizes the theoretical concepts related to I → S. **Figure 13** (p. 170) represents the graph of the function.

#### *3.5.2.2.1. Increased Feelings of Mastery*

In their meta-analytic review, Connolly Gibbons & Crits-Christoph (2021) carved out the mastery aspect of insight, as insight helps to sort and organize previous tangled experiences, emotions, and cognitions. The same assumption is made by a current meta-analysis by Jennissen et al. (2018), as well as the control mastery theory (Silberschatz, 2013). When connecting the mastery aspect of insight with Grawe's *psychological therapy*, the way of action becomes more obvious. Grawe (2000) suggested that positive and mastery experiences induce feelings of control, which facilitate a sense of therapeutic progress. I.e. insight increases the sense of mastery and control due to the newly made self-understandings, which increase feelings of progress. Connolly Gibbons & Crits-Christoph (2021) additionally complement this with the painful aspect of gaining insight: feeling better and experiencing the own resilience can induce a feeling of progress, after going through the painful period of the insight process (see also Timulak et al., 2017). When looking at the effect of insight on success experience, psychodynamic therapies must not be forgotten. Self-understanding

is a central goal and hence a marker for progress in analytic and psychodynamic therapies (Barkham et al., 2021; Norcross & Goldfried, 2019). Barkham et al. (2021) speculates about the possible way of action in this case: "Insight may make symptoms feel more manageable through the development of a narrative as to why those symptoms occur" (Barkham et al., 2021, p. 402).

Similarly, the *contextual model of psychotherapy* by Wampold et al. (2018) can be used to explain the effect of insight on progress experience. One of the main hypotheses of the model is that quality of life is increased by generating alternative explanations which alter the patient's expectations. In other words, by gaining new explanations through the insight process, expectations are adjusted functionally - a similar process as suggested by Grawe (2000). I.e. people start to reconsider and reevaluate their position and possibilities in life due to a new perspective, which was developed throughout the insight process. This new perspective, coming with new possibilities to shape the future, gives a feeling of progressing (Norcross & Goldfried, 2019). Many studies already showed the importance of the insight process for the therapy progress to the patients (for an overview, see Barkham et al., 2021; Huang et al., 2016; Timulak & McElvaney, 2013).

#### *3.5.2.2.2. Transforming Insight into Action*

As previously stated, insight affects not only feelings of progress, but it is also necessary for taking action and transforming the newly gained perspective into behavioral changes. The best theoretical framework for explaining this causality is delivered by Grawe (2000). In his work, he introduces the *Rubicon model* by Heckhausen et al. (2013), which metaphorically describes the act of transforming newly gained perspectives and formed intentions into action (see chapter VARIABLE M - MOTIVATION (P. 83) for a more detailed explanation of the model). The effect of insight on success experience can be explained accordingly. The insight process itself is on the left side of the Rubicon as it is part of the intention of building and clarification process, as well as the aspect of changing expectations (Frank & Frank, 1993; Grawe, 2000). However, the important part in the effect of insight on feelings of progress is on the point of transforming insight into action, i.e. passing the Rubicon (besides the aspect of increased mastery feelings, as described above). The feeling of progressing in therapy also arises from this act of implementing new behavior, solving problems and gaining new qualities in relationships due to a new inner organization facilitated by insight.

#### *3.5.2.2.3. Mediating parameters on the Effect I → S*

For implementing new actions, a few characteristics are needed. Motivation as trait (m) and behavioral skills (r) as common patient variables, as well as the therapeutic alliance (a) crystallized effecting the change process, which are included in our model (Cuijpers et al., 2019; Enck & Zipfel, 2019; Huibers & Cuijpers, 2015; Lambert & Ogles, 2004) (see also chapter THE PROCESS OF GENERATING 'GENERAL DIMENSIONS OF CHANGE' (P. 57) for an extraction process).

**Motivation as Trait.** Motivation as trait is an important patient variable, mediating the effect of insight on success experience. The disposition directly affects a person's tendency to transform insight into action, i.e. starting new patterns, implementing new behavior based on the previously gained insight. Motivation as traits can be seen as an elevated tendency of *doing* things, engaging in challenging but doable tasks, as mentioned within the concept of approach vs. avoidance motivation and the neurobiological findings of asymmetric frontal cortical activity (Scheffer & Heckhausen, 2018; Wasserman & Wasserman, 2020). For example, people with elevated approach motivation are more likely to engage in challenging but still appropriate tasks, compared to their level of skill, compared to populations with dominant avoidance behavior (Scheffer & Heckhausen, 2018). Within the already introduced theories, the mediating relationship of trait-motivation on transforming insight into action can be found as well. For example, describes the *control master theory* an inherent drive of some people which helps them to master problems as a part of their *patient's plan,* which can be seen as a trait-like parameter. According to the nature of one's plan, one is more or less likely to engage in challenging task and start a transforming process, like it is described in the function I → S. Bandura (1982) formulated *self-efficacy* expectations, which influence the confidence in one's own capabilities of having an effect with the own actions (see also the inverse pattern of learned helplessness by Seligman et al. (1979) explicated in chapter PARAMETER M - MOTIVATION TO CHANGE AS TRAIT (P. 124)). This has similarities to the assumptions introduced by the *contextual model of psychotherapy* (Wampold et al., 2018). Both assume that a more positive and stronger belief in the success of the own capabilities is one the one hand trait-like, and on the other hand influences the actual behavior - in the case of I → S, the actual implementation of insight into action as a sign of progress. Motivation as traits has also been part of the common-factor research (see also chapter PARAMETER M - MOTIVATION TO CHANGE AS TRAIT (P. 124)). Under the term hope and expectancy effects are summarized patient-variables which influence optimistic and

benevolent self-expectations. These are assumed to affect behavior and especially engaging in new and challenging tasks, like psychotherapy and implementing therapeutic material (Enck & Zipfel, 2019; Lambert & Ogles, 2004; Wampold et al., 2018; first systematic mention of the effect of expectations goes back to Frank & Frank, 1993). A current overview of empirical data regarding those expectancy effects can be found in Norcross & Wampold (2011). In summary, it has been shown that motivation as trait is a predisposition that helps to transform insights into behavioral and interpersonal changes as a measure for success and progress. Literally speaking facilitates motivation as trait the *crossing of the Rubicon* in the model of (Grawe, 2000; Heckhausen; 2000), by influencing (self-)expectations.

**Behavioral Skills.** The second mediating parameter playing a role in the function I → S is behavioral skills (r). Behavioral skills and competencies are essential for transforming insight into action, hence progressing in therapy. Different theories support this way of action, reaching from problem solving research, action-control theories and up to common factors research. A detailed overview of the different aspects of behavioral skills (parameter r) can be found in chapter Parameter r - Behavioral Resources (p. 117) .

Transforming newly gained insights into action, i.e. changing persistent, often rigid behavioral or interpersonal patterns, is a challenging task. Problem solving research offers here a perspective, investigating what people need or have to solve difficult and new tasks - comparable to the task of implementing insights. Basically, *skills* are an umbrella term for different abilities, behavioral resources, etc. which all help in problem solving. First, skills help to balance internal and external demands (Heppner et al., 2004). A bigger skill set increases the potential capacity of solutions a person has. In other words, skills provide greater freedom and options to master difficult situations, tasks, or demands. Implementing new patterns or doing something one has not done before, ever or infrequently, is basically a problem, a challenging task, which needs to be solved. Skills provide options, possible courses of action that help to find solutions. Hence, the bigger a person's skill set is, the greater the probability of solving the problem, i.e. actually implementing the new pattern (Nezu, 2004; Nezu et al., 2012). Behavioral skills as facilitator of implementing insight are also mentioned by Grawe (2000) in his *Psychological Therapy*. He refers to action-control theories, which deliberately investigate the different skills which are necessary for controlling one's behavior, i.e. doing what one wants to do in the sense of doing difficult things like transforming insights into action. A detailed overview can be found in Grawe (2000). Examples of such theories would be the Action-Control-Theory by Kuhl (1983), or the self-

management-therapy by Kanfer et al. (2012). Behavioral skills are also a key factor in cognitive-behavioral therapy (CBT). An essential part of CBT is the acquisition of new or reacquisition of previously owned skills, in order to manage difficult situations better and to change resistant behavioral patterns (Flückiger & Wüsten, 2021; Hautzinger & Linden, 2015; Nezu et al., 2012). Many findings point to the therapy enhancing effect of skill-training. I.e. an increased skill set improves therapy outcomes by facilitating behavior change (Cuijpers et al., 2008; Gibbons et al., 2009). For example, led interpersonal skill training to an immediate relief in depressive symptoms in young adults (J. F. Young et al., 2010) and skill acquisition at midpoint of therapy predicted outcomes, independent of medication or baseline depressive symptoms, in a study treating 431 patients with cognitive behavioral analysis system of psychotherapy (CBASP) (Manber et al., 2003). Furthermore, behavioral skills are also listed as a common factor, supporting therapy progress in processes like taking risks, facing fears, handling problems, finding solutions and testing reality (Huibers & Cuijpers, 2015; Lambert & Ogles, 2004). All facets of the already mentioned aspects of behavioral skills which facilitate the transformation from insight into action and hence leading to progress in psychotherapy.

**Therapeutic Alliance.** The last parameter, which has a mediating effect on the function I → S, is the therapeutic alliance. As already elaborated in detail in chapter Parameter a - Therapeutic Alliance (p. 100), the therapeutic alliance is an important supporting factor, helping patients in various aspects (Cuijpers et al., 2019; Enck & Zipfel, 2019). First, framing an insight as a success and as a marker of progress can be facilitated by a good therapeutic alliance, especially in patients with internalizing coping strategies and low self-consciousness (Barkham et al., 2021; Wampold & Flückiger, 2023). Second, when looking at the transformation of insight into action, the alliance is an emotional support factor as well. One the one hand, the therapeutic relationship is a helpful framework for creating accountability, planning new behavior, working out new solutions and possibilities. Almost like an externalized version of the parameter behavioral skills, and of course supporting the acquisition of those skills at the same time (Hautzinger & Linden, 2015; Nezu, 2004; Wampold & Flückiger, 2023). On the other hand, does a supporting relationship provide an exploratory base, in the sense of Bowlby (1988), which encourages the patients' self-expectations. Almost like an externalized version of motivation as trait parameter. Fortifying the patient's success and optimistic self-expectancies within the therapeutic relationship is also known as the concept of vicarious hope (Wampold & Flückiger, 2023). A vast body of research

has consistently shown the therapy enhancing effect of alliance as an important factor of therapeutic progress (Flückiger et al., 2012, 2018; Horvath et al., 2011; Wampold & Flückiger, 2023).

Summarizing the chapter, the effects of the parameters motivation as trait, behavioral skills and therapeutic alliance on the function I → S are condensed metaphorically. When using the crossing a river (the *Rubicon*) as a picture for transforming insight into action, then insight stands for the development of the idea that crossing the river might be a good idea and is necessary for progressing. Trait motivation helps a person to pick up this newly formed idea, give it an extra drive and stick to it - it *intensifies the intention to do so*, using the jargon of Grawe (2000). Behavioral skills stand for the resources the person brings with him/her: the knowledge to build a bridge over the river, maybe the ability to jump or to swim, and also the ability to find a flexible (different) solution. The therapeutic alliance acts like an incubator. A framework that helps to keep all the different parts playing together and coordinating them better. The alliance helps in the beginning of the process to form insight in the first place, to build an intention, then abstracting a specific actionable behavior out of that intention and then helping to connect the motivation to this process. When it comes to the actual crossing, the alliance helps to coordinate the usage of tools, timing of actions, evaluating possibilities and providing accountability. All of this is not done in a regulatory way, but in a way that aims to support the patient's self-reliance and finding a good and long-lasting solution by him/herself. As in incubator does with newborns - the incubator cannot grow for the baby, but helps the baby to grow itself. Even after crossing the river, the therapeutic relation helps to recap what happened, appreciate the own abilities, see the progress and maybe even help to alter future expectations and self-concepts step by step.

#### *3.5.2.2.4. Nature of the Function*

The function I → S is pictured by a logistic growth function (**Figure 13**, p. 170). The steepness depends on the values of a, m and r, as the parameters mediate the relationship. Increased values of a, m and r lead to an enhanced feeling of therapeutic progress (↑S). In turn, if a patient does not have any behavioral competencies, very low trait-motivation, and the therapy is lacking a supporting alliance, almost no transformation from insight into action can be made. However, the function is characterized by the damped effect at very low and very high levels of insight. I.e. the steepest gradient, and with that, the highest

feelings of success are achieved with mid-levels of insight. This limitation reflects the natural effect of limited growth, at specific high levels of insight, not endless actions can be implemented.

Taken together, there is enough evidence to recommend that the function remains part of the model.

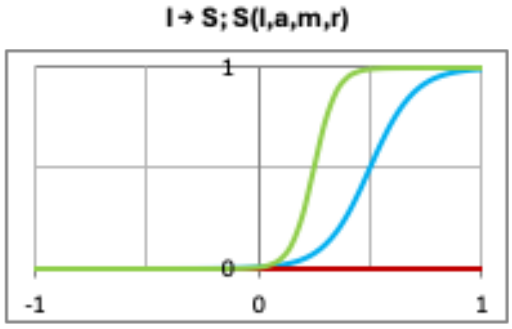



***Figure 13**: Graph of the function I → S (x-axis: input, y-axis: output).*

### 3.5.2.3. Open for Discussion: Function I → P

The effect of insight on problem intensity has not been included in our model up to date. The question of whether insight increases or decreases problem intensity is a complex issue, because of the time-dependency of this effect. On a short term, it can be assumed that insight increases problem intensity or at least negative emotions (Gelso & Harbin, 2007; Hill et al., 2007). Although, immediately the question arises, whether gaining insight as a confrontation with painful material evokes only negative emotions in a short term, or if it directly affects the extent of felt problem intensity. There is some evidence for trajectories of change in psychotherapy, which reveals part-time deteriorations (Grawe, 2000). A huge study by Owen et al. (2015) analyzed over 10.000 patient-courses, extracting three trajectories. One of them displays an initial increase of severity/decrease of functioning, following rapid improvements after a few therapy sessions. Hence, this could be an indicator of a slight deterioration, when assuming insights were made during that first therapy phase and are causative for those symptom exacerbations. Besides those temporary exacerbations, only little is known about the general increase of symptom severity because of psychotherapy. Evidence is inconsistent, suggesting deterioration rates between four and ten percent, depending on definitions, samples etc. (Barkham et al., 2021; Cuijpers et al., 2018; Klatte et al., 2023). So, it might be the case that insight - when treating psychotherapy as a general process of generating insight - leads to deterioration in some patients. However, using outcome-measured symptom increase as an indicator for a maybe temporarily dampening effect of insight on perceived problem intensity is not optimal. Additionally, it is important to annotate that generating insight is only a part of psychotherapy. Hence, equalizing elevated feelings of problem intensity due to insight with general deteriorations in psychotherapy is a tottery endeavor. For some specific conditions, such as patients with comorbid

PTSD and substance abuse disorders, studies even suggest that there is even no increased risk of symptom exacerbation during the initiation of exposure-based interventions (e.g. imagery rescripting), compared to other types of psychotherapy (Lancaster et al., 2020). Hence, those assumed to be heavily insight-promoting interventions do not lead to deterioration.

This matches to the already introduced evidence about insight (see chapters VARIABLE I - INSIGHT (P. 88) and FUNCTION E → I (P. 139)), which proposed a long-term positive effect of insight. I.e. although insight might lead to negative emotions and symptom deterioration in a short-term, due to the engagement with painful material and uncovering of maybe traumatic or straining events and enmeshments, it is supposed to lead to a symptom decrease on a long term. Insight allows new perspectives to become possible due to a new inner organization. Habitual effects of confronting oneself with the previously avoided material help to increase feelings of mastery and self-consciousness (Jennissen et al., 2018; Barkham et al., 2021).

In conclusion, the impact of insight on symptom exacerbation or relief is ambiguous and varies across patient populations and considered time-scales (I⬆️ → P⬆️ short term vs I⬆️ → P⬇️ long term). While some evidence suggests the potential for symptom exacerbation during psychotherapy in a minority of cases, most studies show an overall positive effect of insight on outcome (symptom severity). As we try to keep the model as simple as possible, we argue that the temporary deterioration that might be caused by insight is covered with the function I → E and the overall positive effect of gaining insight is covered with the function I → S. However, it cannot be ruled out that in some cases people might feel completely overwhelmed when gaining new self-understandings, feel sad or even frightened of what they discover, when confronting themselves with painful material and engaging in the insight process. Nevertheless, most of the research shows a symptom reduction as a result of psychotherapy and insight in particular (Fitzpatrick & Stalikas, 2008b; Grawe, 2000; Jennissen et al., 2018), even in very confronting techniques like rescripting in trauma (Lancaster et al., 2020). In conclusion, up to date there are not enough findings, particularly studies investigating the time dependent effect of insight on problem intensity, which are valid enough to amend the function I → P to the model.

#### 3.5.2.4. Open for Discussion: Function I → M

The function I → M is currently not included in our model. In the following, some evidence is reviewed regarding the relation of insight and motivation.

##### *3.5.2.4.1. Small Excursus: Insight as a Psychiatric Term vs a Psychotherapeutic Term*

As already outlined in chapter VARIABLE I - INSIGHT (P. 88) , does insight relate to a process of self-understanding, connecting cognitions, emotions and behavior by engaging in usually straining material. This can also be referred to as emotional or hot insight and is used within the psychotherapeutic jargon (Kuncewicz et al., 2014; Schiepek et al., 2017). However, when looking into the relation between insight and motivation, one comes across the psychiatric use of insight (also clinical insight) (Linn-Walton & Maschi, 2015; Martin, 2023; Moro & Avdibegovi, 2012). In this context insight refers to "broadly refers to the ability of the patient to be consciously aware of the illness, recognize that their symptoms are indicative of mental illness and that these symptoms require treatment" (Choudhury et al., 2021, p. 2).

This usage of insight goes back to the works of Kraeplin (1906), Bleuler (1911) and Jaspers (1913), who used the German term 'Einsicht' to describe the patient's lack of acceptance of the illness especially in psychotic disorders (Moro & Avdibegovi, 2012). This is also closely connected to the assessment of one's criminal capacity (Moro & Avdibegovi, 2012). In terms of the relation between insight and motivation, the connection is quite clear within the psychiatric realm. Only when there is insight in the form of acceptance of the illness, compliance and motivation for treatment can be there. In this case, insight would be the prerequisite for therapy motivation. Some studies investigating motivation and insight especially in addiction-disorders underline these assumptions - although a review could hardly be conducted, because the operationalization of the terms insight and motivation are usually incoherently (see Linn-Walton & Maschi, 2015 for a discussion and overview).

The description of the psychiatric understanding of insight makes it quite obvious that it differs greatly from the psychotherapeutic use of insight, that was described in chapter VARIABLE I - INSIGHT (P. 88) . The emotional or hot insight used in psychotherapy does not refer to the patient's compliance with treatment, but rather to a deep within-person emotional-cognitive understanding process (Gelso & Harbin, 2007; Martin, 2023). Also, within the psychotherapeutic realm, there are different definitions of insight, emphasizing a more

emotional or a rational-intellectual characteristic (see Kuncewicz et al., 2014 for a corresponding concept). Although we do not promote the intellectual-rational characteristic, as some authors also attribute to insight, it is important to mention, that due to the various definitions of insight, also different conclusions about its relation to motivation can be made (Kuncewicz et al., 2014; Martin, 2023).

#### *3.5.2.4.2. Insight Motivating Through Remoralization*

And still there is a common ground of all insight process that lead to rough estimation of its impact on motivation: regardless of attaining acceptance about one's' illness or gaining a deep, previously undiscovered cognitive-emotional self-understanding - something new has to be discovered in order to have the chance to want to change something, "because if one is aware of nothing identified as problematic, one will not bother to change" (Martin, 2023, p. 3).

This restructuring of the inner landscape and making new connections can work as a *clarification of motivation,* especially in patients with previous ambiguous motivation (Grosse-Holforth et al., 2007). However, in patients with already high motivation for psychotherapy, this effect might not be there. The clarification of motivation has similarities with the intention clarification process introduced by Grawe (2000) in his expanded version of the Rubicon Model. He argues that through clarifying intentions through insight, new perspectives are possible, which might influence the patient's motivation within therapy. Though his expanded version of the Rubicon Model still misses the discussion of genesis of motivation. Nevertheless, making the connection between insight and motivation over the perspective of gaining insight is not only made by Grawe. Also, Wampold et al. (2007) speculate within their contextual model of psychotherapy (see chapter FUNCTION I → S (P. 164)) that insight has the potential to re-arrange motives and to re-moralize the patient again, i.e. inducing hope again (Frank & Frank, 1993). Norcross & Goldfried (2019) argue that insight creates meaning, which induces new expectations and hopefulness, which might be a precursor of motivation. Similar hypotheses were made by Johansson et al. (2010), who described insight as a process of understanding the own motivations which might have a motivating effect. However, they only measured pre-treatment motivation, so neither a correlation with pre-/post-insight nor post-motivation is possible. Taken together, the conscious change of meaning and generating new perspectives and explanations might give insight a motivational potential (Gelso & Harbin, 2007; Kuncewicz et al., 2014). Getting

to know the own maladaptive patterns might have the effect of generating motivation to change them. However, insight has not been shown to lead calculable to a behavior change, which could be an indicator of (transformed) motivation (Kuncewicz et al., 2014). Bridging insight and motivation by using expectations and meaning shows similarities to the relation between insight and success, hence is not unique to I → M. Additionally this expectation-based-explanation remains very hypothetical, and studies are missing to underpin this assumption about the motivational potential of insight (Kuncewicz et al., 2014).

#### *3.5.2.4.3. Insight as a Motivation-Inducing Flow-State*

A completely different perspective on the relation of insight and motivation is taken when seeing insight as a flow-state inducing activity. Insight was already compared to problem-solving activities (see VARIABLE I - INSIGHT (P. 88)), which are known for having the potential to induce flow-states (Alexander et al., 2021; Jackson, 2012). When looking at the description of characteristics of activities which induce flow-states, similarities to the insight-process can be made:

> *Flow is experienced in a broad array of different problem solving situations from artistic activities (de Manzano et al., 2010), to athletics (Jackson et al., 1998, 2001), computer programming, video gaming (Harmat et al., 2015), and many occupational activities. According to Csikszentmihalyi (1988), any activity, mental or physical, can produce flow as long as it is a challenging task that demands intense concentration and commitment, contains clear goals, provides immediate feedback, and is perfectly matched to the person's skill level. (Alexander et al., 2021, p. 237)*

The patient needs to be concentrated and committed to engage with the painful material, which needs to be chosen consciously - similar to an explicit goal. In the process of insight, the patient experiences a deep immediate emotional state according to Sachse et al. (2003), and is guided by the therapists, who takes care about the intensity, which is similar to the immediate feedback and the matching of the skill level needed in flow-states. Flow is said to be experienced as a rewarding process, tightly connected to the feeling of freedom (i.e. new perspectives), intrinsic motivation and often a state which is sought for again (Jackson, 2012). Transferring this to the insight process, one could hypothesize that the insight process itself is similarly rewarding as a flow state and hence, has a motivating effect of further engaging with the therapy in order to get into a flow-like insight process again. But it must be said, although there can be pointed out some similarities between the insight process and other flow-evoking processes, this remains highly speculative, and without any underpinning empirical findings.

#### *3.5.2.4.4. Summary: Potential effect of Insight on Motivation*

Taken together, there is some evidence indicating a motivational potential of insight. I.e. a motivational clarification could occur through the self-understanding process, which might elevate motivation to change, especially in previously un-motivated or ambiguous patients. However, findings are limited and diffuse. Especially the different usage of insight (compliance with treatment vs. self-understanding) makes a recapitulatory summary of studies difficult. Because of these difficulties, the different typologies of insight, the different and complex interactions with motivation and the lack of empirical studies, we would not recommend including the function I → M in the model at the moment. If a later model considers amending the function, especially the patient's motivation as trait and the therapeutic relationship should be focused on, as they might influence the relation. Initial trait motivation could even dampen the effect of insight on motivation (Kuncewicz et al., 2014), and the therapeutic relationship could help to transform insight into motivation - similar to its role in I → S.

### 3.5.2.5. Open for Discussion: Function I → I

The self-enhancing effect of insight (function I → I) is not included in our model, as there is no evidence pointing in such a direction. It remains the firstly painful nature of insight, which can be seen as an almost counter-intuitive barrier regarding a self-enhancing effect. As its core, the insight process requires engagement in painful and previously avoided material (e.g. as already discussed in detail in the chapters VARIABLE I - INSIGHT (P. 88), FUNCTION E → I (P. 139) and EQUATION: I - INSIGHT (P. 231); e.g. Gelso & Harbin, 2007). This means engaging with this material and content needs to be almost a conscious decision by the patient, or at least intended by the therapist, as the painful material was avoided previously. So, it is obvious that engaging in the insight-process probably does not happen on its own, and hence, does not lead to a self-referential loop due to its almost aversive characteristics - at least short term. It might be comparable to the chemistry model of activation energy (see also Arrhenius equation) (Kurzweil, 2023; Pal, 2020). In some systems, the potential energy is not enough to start the chemical reaction - energetic input (i.e. activation energy) is needed to start the reaction. The reaction will not start by itself unless enough activation energy is provided. The insight process might be similar structured: it will not happen on its own unless an external input (as a conscious decision by the patient or the therapist) helps the process to start. Literally speaking, does the final product, i.e. state after the

insight process (= the reaction), hold more energy than the previous state. This is comparable to the long-term positive, restructuring effects of insight discussed in chapter FUNCTION I → S (P. 164). If anything, the insight process could help to develop the capacity of cognitive control, which helps future insight processes. There is some evidence suggesting a moderated effect of increased insight via mindfulness (Nakajima et al., 2019). I.e. increased mindfulness leads to increased insight, which might help to develop mindfulness again. This way of action could work as an insight-facilitating loop, as insight helps develop a skill (e.g. self-reflectedness, awareness, mindfulness) which allows easier access into future insight processes. However, this is no evidence for a directly self-enhancing effect of insight, as it works with a second variable (mindfulness) which could be referred to parameter c (cognitive skills) in our model.

Taken together, no indicators could be found in the reviewed literature pointing to a self-enhancing effect of insight, besides the development of insight-facilitating capacities like mindfulness. This is in line with the discussed nature of insight, as it is always related to an engagement with negative emotions. This engagement usually needs a conscious decision, hence it is almost oppositional to a self-enhancing loop.

### *3.5.3. Functions of M - Motivation*

The variable M describes the patient's situational motivation to change, the readiness for engagement in experiences and therapy-related activities, on a moment-to-moment and day-to-day basis. Motivation is assumed to interact with insight (I) and success (S) in a way that motivation supports engagement in the insight process and the therapeutic work, i.e. supports success. The functions are influenced by the parameters of cognitive competencies and the therapeutic alliance (in the case of M → I), behavioral competencies, motivation as trait and also the alliance in the case of M → S. The potential relation of motivation with other variables (E, P, M) is discussed.

#### 3.5.3.1. Function M → I

| Theory | Reference |
|---|---|
| psychiatric understanding of insight | (Linn-Walton & Maschi, 2015) |
| trans-theoretical model of change | (Norcross et al., 2011) |
| **mediating factors** | |
| therapeutic alliance a | |
| cognitive competencies c | |

***Table 18**: Theoretical concepts related to M → I.*

One of the two functions included in the model regarding motivation is the relationship between motivation and insight. The model posits a facilitating effect of motivation in the process of gaining insight, indicating that a certain level of motivation is necessary to initiate and support the insight process. **Table 18** (p. 177) summarizes the theoretical concepts related to M → I. **Figure 14** (p. 179) represents the graph of the function.

##### *3.5.3.1.1. Motivation and Insight for Treatment*

This concept can be metaphorically understood through the chemical model of activation energy, as discussed in chapter OPEN FOR DISCUSSION: FUNCTION I → I (P. 175) . Insight is conceptualized as having a short-term aversive nature, suggesting that engaging with challenging or painful material is a necessary component of the insight process. However, after a short-term increase in aversiveness, relief will follow. The patient's willingness engaging in such an exhausting process can be seen as therapeutic motivation covered with variable M. That is, a patient needs to be sufficiently motivated in order to engage and preserve in the insight process, facing straining memories and negative emotions. Most studies investigating the relationship between motivation and insight focus on the psychiatric understanding of insight, i.e. the acceptance and compliance for treatment. From this perspective, a meta-analysis by Linn-Walton & Maschi (2015suggeststs that motivation and insight are necessary for better outcomes and insight is a 'byproduct' of treatment motivation (Bui & Morash, 2010; Linn-Walton & Maschi, 2015; Shaffer et al., 2009). However, the results are very constricted because of the ambiguous definitions and measurements of insight and motivation of the included studies. According to the authors, most studies used a psychiatric-oriented definition of insight. Another study examining motivation and insight in eating disorders showed that improvements in motivation led to increased 'insight capacity'

(Scanferla et al., 2022). However, also in this case, the definition of insight was more orientated to the acceptance of treatment-necessity than the psychotherapeutic use of insight, as we focused on.

#### *3.5.3.1.2. Trans-theoretical Model of Change for Bridging Psychiatric and Psychotherapeutic Insight*

Nevertheless, the findings still can be used to connect motivation and psychotherapeutic insight. The trans-theoretical model of change (TMoC) by Norcross et al. (2011) provides the necessary framework. The model suggests different stages of change, analyzing and describing the client's readiness to change. Krebs et al. (2018) introduced a version of the model tailored to psychotherapy. Already stage one formulates a consciousness raising, where "clients are intending to make major changes, but do not have a specific timeframe in mind" (Krebs et al., 2018, p. 3).

This intention to change is already a bud of treatment motivation. The authors further formulate stage two *dramatic relief*, which encompasses the emotional awareness of the disorders pattern, illness, etc. Although the stages were initially focused on the insight of necessity for treatment, their described critical point of emotional-relief comes very close to the psychotherapeutic use of insight ('aha-moment', hot-insight, see also VARIABLE I - INSIGHT (P. 88)). Concluding further, Krebs et al. (2018) formulate the initial treatment motivation as a needed precursor of the later dramatic relief, i.e. insight-like moment, as the stages build on each other.

Besides the few findings about the relationship between motivation and insight directly, there is a greater body of research showing an association of motivation with better outcomes across various disorders (Barkham et al., 2021; Høglend, 1996). Especially the patient's autonomous motivation for treatment is important for the therapy outcome (Barkham et al., 2021). Based on a comprehensive review, Barkham et al. (2021) even suggest using the technique of motivational interviewing prior to further psychotherapeutic interventions, if treatment motivation is low. Because if the patient's motivation is low, the probability of further important change processes decreases massively. Although these findings do not connect motivation and insight directly, motivation has to be shown to be a crucial predictor for any other psychotherapeutic process, hence including insight. Summarizing these findings, we argue, that if treatment-motivation determines patients' engagement in the therapy-process (Barkham et al., 2021) and further psychotherapeutic change, it can also be

assumed to be a needed precursor of the insight process, which is an important part of the therapy process.

#### *3.5.3.1.3. Characteristics of the Function & Mediating Parameters*

The relationship between motivation and insight is reflected by a logistic growth function, with increasing levels of motivation leading to increasing levels of insight (Schiepek et al., 2017) (see **Figure 14** (p. 179)).

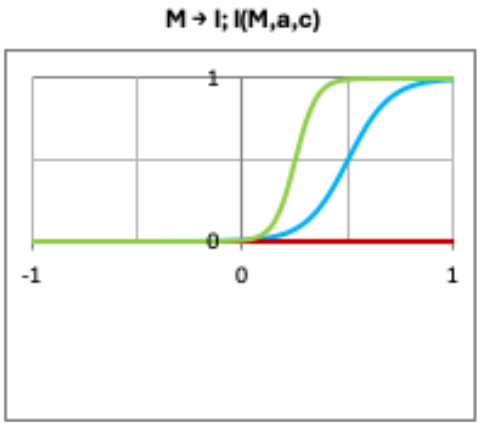



***Figure 14**: Graph of the function M → I (x-axis: input, y-axis: output).*

The therapeutic alliance is assumed to facilitate that process, i.e. the better the alliance, the more motivation will lead to insight-processes. Findings show a supporting effect of the therapeutic relationship on the patient's motivation (Krebs et al., 2018; Scheel, 2011). According to Krebs et al. (2018) is a sensitive guidance of the therapeutic process is necessary, in order to lead the patient optimally to the next stage of change (based on the TMoC). In conclusion, the alliance is important to transform motivation to therapeutic change optimally, such as insight. Based on the self-determination theory (SDT) Ryan & Deci (2008) stressed the importance of patient's autonomous motivation, which needed to be supported by the therapist, in order to "enhance […] the likelihood that treatment gains will be achieved and maintained." (Ryan & Deci, 2008, p. 186). Scheel (2011) summarizes that all therapeutic approaches make use of motivational techniques, which is "implicitly inferring that client engagement in the therapeutic process propelled by client motivational energy is crucial to positive outcomes" (Scheel, 2011, p. 278).

Besides the therapeutic alliance also the patient's cognitive competencies (c) are assumed to facilitate the effect of motivation on insight (Schiepek et al., 2017). The parameter c includes cognitive competencies such as emotion regulation and self-reflection, which help to bundle perpetuate motivation. Higher capacities of self-reflection also facilitate insight processes, as this is a key competency for this process. Neuropsychological findings underpin these relations: the lateral prefrontal cortex (LPFC) has been shown to be a central brain area involved in cognitive competencies (c). The LPFC has a regulating effect on the striatum, which is central for motivational process. Additionally, there is an inhibiting effect of the LPFC on the amygdala. This is especially relevant for perpetuating learning

processes, which are not always pleasant. The LPFC helps to inhibit the desire to quit the current straining (but long term rewarding) activity. The similarity to the insight process is obvious: cognitive control (located in the LPFC) helps to bundle and keep up the motivation to stay in the short-term aversive insight process (for a detailed overview, see Schultheiss & Wirth, 2018).

Last, the possible influence of parameter m has to be mentioned. Up to now, m is not considered in the relationship between motivation and insight. However, there is some evidence showing that motivation as trait comes along with a general tendency to rather engage in challenging but still growth-enhancing tasks, such as psychotherapy (Scheffer & Heckhausen, 2018). Hence, trait motivation could further facilitate state-motivation itself and its effect on insight.

Taken together, motivation is assumed to be a crucial aspect of the insight process in psychotherapy. The model posits that motivation plays a facilitating role in the process of gaining insight, indicating that a certain level of motivation is necessary to initiate and support the insight process. The therapeutic alliance and the patient's cognitive competencies are also identified as mediating parameters in the relationship between motivation and insight.

### 3.5.3.2. Function M → S

| Theory | Reference |
|---|---|
| cognitive psychology: incentives and motivation | (Botvinick & Braver, 2015) |
| need satisfaction and motivational clarification | (Grawe, 2000) |
| teleonomic model of subjective well being | (Holtforth & Michalak, 2012) |
| autonomous motivation (self-determination theory) | (Deci & Ryan, 2000) |
| trans-theoretical model of change | (Prochaska & Velicer, 1997) |
| low approach motivation as a characteristic of disorders | |
| **mediating parameters** | |
| therapeutic alliance a | |
| motivation as trait m | |
| behavioral skills r | |

***Table 19**: Theoretical concepts related to M → S.*

The second function included in the model regarding motivation is its relationship to success. The model posits motivation as a precursor of therapeutic success, indicating that motivation supports and is also necessary for therapeutic progress. Patient characteristics like reward expectation (trait motivation m) and behavioral skills (r), as well as the therapeutic alliance (a) are assumed to further facilitate the effect of motivation on success experience. **Table 19** (p. 181) summarizes the theoretical concepts related to M → S. **Figure 15** (p. 188) represents the graph of the function.

#### *3.5.3.2.1. Looking into Cognitive Psychology: Cognitive Control & Motivation*

The first perspective considered is that of fundamental research in cognitive psychology. An established paradigm for testing the effect of (extrinsic) motivation on cognitive control is the investigation of incentives on task performance (Botvinick & Braver, 2015). The general effect found is that incentives enhance cognitive control and ultimately lead to better outcomes. Intrinsic motivation works similarly, probably even better in enhancing cognitive control and task performance. However, if the subject has a high intrinsic motivation, incentives are counterproductive (undermining of intrinsic motivation) (Botvinick & Braver, 2015). What can be derived from our model is that motivation is related to task

performance. Especially intrinsic motivation enhances task performance via effecting cognitive control. Hence, based on the findings that intrinsic motivation is also crucial for psychotherapy (further discussions in the next paragraphs to autonomous motivation), a similar way of action might also apply here, i.e. motivation enhances cognitive capacities used in psychotherapy and finally leads to increased outcomes in the form of therapeutic progress. When looking at the affected brain networks in motivational processes, especially reward-value and control-function networks seem to be involved. However, clear conclusions cannot yet be drawn because many regions "including dopaminergic projections, ventral striatum, ventromedial PFC, lateral PFC, and ACC appear to serve as critical channels for control-relevant motivational signals" (Botvinick & Braver, 2015, p. 103) appear to be engaged in those processes. Interestingly, some of those areas are also associated with neural correlates of state-motivation (see chapter Neurobiological Correlates of Motivation (p. 85)) and cognitive competencies, like emotion regulation and mentalization (see chapter Neurological Underpinnings and Similarities of the Concepts (p. 114)). Those parameters are assumed to influence the effect of motivation on success.

#### *3.5.3.2.2. Theoretical Perspective of Therapy Motivation and Therapeutic Progress*

Three theoretical perspectives can be taken when investigating the effect of motivation on success experience. The first one examines motivation and success out of a **perspective of need-satisfaction**. Within Grawe's consistency theory, it is assumed that if motivation and basic (psychological) needs are well aligned, need satisfaction is sufficient and a state of congruence is achieved (Grawe, 2004b). However, often - especially in mental disorders - motivation and needs are not sufficiently aligned, leading to inadequate need satisfaction. Hence, one important mechanism in psychotherapy is the clarification of motivation and intention to improve the alignment with needs Grawe (2004b; Gómez-Penedo et al., 2023). As already discussed in chapter Open for Discussion: Function I → M (p. 172), is the feeling of success and progress an indicator of an already better satisfaction of needs. Taken together, motivational clarification is needed to extract, focus and intensify motivation in order to facilitate need satisfaction, which is reflected in therapy progress (Holtforth & Castonguay, 2005). The teleonomic model of subjective well-being by Brunstein and Maier (see modified version by Holtforth & Michalak, 2012, p. 446) summarizes the relationship between motivation, motivational alignments, needs, progress and well-being nicely:

> *If someone pursues his or her goals with commitment (i.e., he or she identifies with the goals and feels motivated to realize them), and if his or her life situation*

> *facilitates the attainment of these goals, progress in goal striving is more likely. Goal progress, in turn, is assumed to contribute to the person's emotional well-being. (Holtforth & Michalak, 2012, p. 446)*

In our model, this relation is covered by the function of M → S, i.e. motivation facilitates therapeutic progress. Another aspect supporting this relation is the role of the therapist and the therapeutic alliance, as pointed out by Holtforth & Michalak (2012). Better outcomes are achieved, and alliance-rupture-repair-sequences are resolved if the therapists sensitively attune the process to the patients' goals and motivation. Hence, fostering the patients (autonomous) motivation optimally leads to better outcomes (Bordin, 1979; Holtforth & Castonguay, 2005; Orlinsky et al., 2004).

This directly leads to the second perspective of **autonomous motivation**, which comes close to the term of **therapy motivation**. Based on the self-determination theory (SDT) (Deci & Ryan, 2000) an important psychological need is autonomy. Fostering this need will enhance several aspects of health, well-being and also psychotherapeutic work (Ryan et al., 2011). Holtforth & Michalak (2012) even describe autonomous motivation as the major driver of change:

> *Probably the most favorable approach that patients can bring to therapy would be one that is characterized by interest, curiosity, and commitment. The term autonomous motivation (Ryan & Deci, 2000) closely resembles this ideal kind of therapy motivation. For the purposes of psychotherapy, autonomous motivation can be defined as 'the extent to which patients experience participation in treatment as a freely made choice emanating from themselves' (Zuroff et al., 2007, p. 137). (Holtforth & Michalak, 2012, p. 443)*

Effects of sufficient therapy motivation reach from better cooperation, better treatment and protocol adherence, higher engagement, higher openness for testing new behavior, up to less resistance to interventions and fewer dropouts (Holtforth & Michalak, 2012; Ryan et al., 2011; Zuroff et al., 2007). Aside from that do patients expectations of therapy and hope for improvement, as well as a good alliance, essentially influence the course of autonomous motivation, which is reflected by the variables m and a and discussed in the next chapters as well (Holtforth & Michalak, 2012). Autonomous motivation was also found to be an important predictor of outcome (Barkham et al., 2021; Zuroff et al., 2007). Taken together, autonomous motivation is essential for initiating and sustaining change processes, such as psychotherapy (Ryan & Deci, 2008). Higher levels of autonomous motivation make change and, with that progress, much more probable. This is underlined by several findings, which connect higher treatment motivation with better outcomes (Barkham et al., 2021; Zuroff et

al., 2007). Fostering autonomous motivation within psychotherapy by the therapist helps even further to enhance progress (Holtforth & Michalak, 2012; Ryan & Deci, 2000).

The third perspective relates to **actions as a sign of progress** and the relation of taking action and motivation. The trans-theoretical model of change (TMoC, already introduced several times in this thesis, e.g. in chapter VARIABLE M - MOTIVATION (P. 83)) (Prochaska & Velicer, 1997) delivers a framework of how change can take place. The suggested stages of precontemplation, contemplation, preparation, action, and maintenance are characterized by a progressive connection between motivation and action (Norcross et al., 2011). Hence, action is a sign of progress and it is facilitated by motivation. Another important method to mention here is the Motivational Interviewing (Miller & Rollnick, 2002; Ryan et al., 2011), often used as a practical intervention to work on the stages of change. The interview techniques aim to enhance the client's autonomous motivation by specific negotiation techniques, with the ultimate goal of facilitating change. When looking at the transformation of motivations and intentions to action, the already introduced *Rubicon Model* has to be mentioned (see chapter VARIABLE M - MOTIVATION (P. 83)). Grawe (2000) argues that in order to implement new action (one goal of therapy), initially motivations and intentions need to be focused and cleared (motivational clarification/clarification process). Only if one knows where he/she wants to go, a proper action can be started. Second, 'enough' motivation, supported by behavioral competencies (r), is needed to really start the pattern change and *cross the Rubicon* (metaphor of transforming intention to action). Taken together, motivation seems to be a crucial element for starting action, and taking action is a sign of progress - also in the therapeutic context.

#### *3.5.3.2.3. Findings Supporting Motivation as Major Driver for Change and Outcome*

Besides the already introduced theories that align with the function M → S, there is also a vast body of research supporting therapy motivation as a key factor for therapeutic change, which we use here as an indicator of therapeutic progress (S).

Pre-treatment motivation is associated with enhanced outcomes (Høglend, 1996; Keithly et al., 1980) and also better treatment adherence (Alfonsson et al., 2017, special focus on intrinsic motivation in 100 face-to-face and online treated patients). Several meta-analysis and reviews substantiated these effects: Barkham et al. (2021) found that engagement in therapy is an important factor for progress. Furthermore, higher levels of motivation and higher stages of change (as a sign of elevated intrinsic motivation) lead to enhanced

outcomes. It has also been shown that autonomous motivation is superior to extrinsic motivation regarding the effect on outcomes. The authors focused on studies which referred to motivation as the patient's "dynamic propensity for initiating and sustaining behavior change" (Constantino et al., 2021, p.238). However, they also underlined the problem of inconsistent definitions across studies, the lack of differentiation of autonomous and external motivation, which ultimately might be a reason for inconsistent findings in various studies. A big review by Krebs et al. (2018), encompassing 76 studies and over twenty-five thousand patients, linked the readiness for treatment with outcomes: "Outcomes were a function of the pretreatment stage of change; that is, the farther a patient along the stages, the better the treatment outcomes" (Krebs et al., 2018, p. 1964).

As already discussed earlier, higher stages of change are characterized by higher levels of motivation. Hence, stages with higher levels of motivation are associated with better treatment outcomes. Further higher levels of therapy motivation are positively related to elevated mood and increased satisfaction of therapy, as well as a higher intention to persist in treatment (McBride et al., 2010). Additionally, higher levels of motivation and better therapeutic alliance predicted a higher probability of remission. Although, this depended on symptom severity - with increasing importance of therapeutic alliance at higher levels of depression (McBride et al., 2010). McBride et al. (2010) analyzed 74 outpatients who received 16 sessions of interpersonal therapy, measuring motivation and alliance at the third session, symptom severity pre- and post-treatment. Vitinius et al. (2018) found an impact of patient motivation and therapist empathy on success of therapy, especially in reducing depressive symptoms. 92 patients were assessed in a follow up after a nine-week inpatient-treatment, regarding their perceived therapist's empathy, therapy motivation as well as symptom severity and impact on therapy success (time-points were admission, discharge and 1-3 years follow up). Furthermore, Wu et al. (2020) underlined the importance of therapist empathy on success in therapy in motivational processes in motivational interviewing. In a study assessing 343 outpatients, an enhancing effect of patients' expectation (m) and therapy motivation on therapy success was found (Ogrodniczuk et al., 2018). More precisely was higher internal motivation associated with higher levels of engagement, and more external motivation with less engagement. Schneider et al. (1999) showed as well that patients' motivational characteristics in the sense of trait motivation enhance the effectiveness of the treatment (assessing openness in 219 patients). Additionally, a more recent study underlined the relation between pre-treatment expectation and pre-treatment-motivation

and therapy engagement and -motivation (Reich et al., 2021). Taken together, the enhancing effect of motivation on therapy progress is found in many studies. Although, different measurements and definitions of therapeutic progress (S) and motivation (M), as well as the availability of mostly pre-post assessments, limit the interpretability. The therapeutic alliance and trait-motivation seem to have an important effect on the relation between motivation and success as well. This is picked up in the last part by discussing mediating parameters.

Besides the enhancing effect of high levels of motivation on therapy progress and engagement, there is also an effect assumed in the opposite direction. "Negative motivations" encompass concepts like avoidance goals (Grawe, 2004b), self-handicapping, failure-oriented motives, and self-harm (R. Baumeister, 1991; Baumeister, 2013; Schiepek et al., 2017). Also, resistance to change is an indicator for low-level motivation (Barkham et al., 2021). These "negative motivations" are assumed to lead to reduced experiences of success, failure, or even therapeutic loss (Schiepek et al., 2017). Higher levels of resistance were already found to be related to lower levels of outcome, and lowering resistance throughout therapy can be a marker of therapeutic success and progress (Beutler et al., 2011; Hara et al., 2015). However, the therapeutic alliance is also an important mediating parameter in this case. Beutler et al. (2011) found in their meta-analysis of 12 studies with over 1000 patients that higher levels of resistance lead to worse outcomes, but the effect is mediated by the directiveness of the therapy. I.e. if higher levels of resistance were encountered by less directiveness, outcomes increased. Hence, although lower levels of motivation and increased resistance can worsen the therapeutic progress, the effect can be attenuated by using a less directive therapeutic style. A sensitive therapist and a good therapeutic alliance are needed to adjust the therapeutic style accordingly (Yasky et al., 2016).

#### *3.5.3.2.4. Low (Approach) Motivation as a Characteristic of Disorders*

The last perspective taken on the relation between motivation and success experience is the one of deficits in motivation in disorders. "Negative motivation", as already argued, refers to avoidance goals and a lack of approach motivation (Grawe, 2004b; Schiepek et al., 2017), and is related to lower outcomes and less treatment motivation (Beutler et al., 2011). At the same time show various disorders increased avoidance and decreased approach motivation, as well as associated measures like altered cortical asymmetry (Harmon-Jones & Gable, 2018) and deficits in reward processing (Umemoto & Holroyd, 2017; Whitton et al.,

2015) (see also chapter Neural Correlates of Trait Motivation (p. 130)). That is, if approach motivation is important for gaining and experiencing therapeutic progress and at the same time several mental disorders are exactly lacking this motivation, it is important to focus on this in psychotherapeutic interventions. A review of 29 studies in PTSD patients showed a lowered approach motivation for positive stimuli, falling in line with the modeled dampening effect of "negative motivation" on perceived success (Nawijn et al., 2015). Another study reviewed transcripts of ideographic measures goal assessing progress in therapy (Lloyd et al., 2019). It was found that an increased focus on approach-goals, which can be seen as a way to enhance approach motivation, facilitated psychotherapeutic progress. Finally, there is also already some evidence showing that interventions focusing specifically on increasing approach motivation in approach-deprived patients have a substantial effect on symptom reduction. Craske et al. (2019) assessed 96 patients going through 15-weeks of positive or negative affect treatment. The first treatment focused on increasing approach motivation; the latter focused on decreasing negative symptomatology. Results showed a higher increase in positive emotions and a higher decrease in negative emotions, as well as fewer symptoms and anxiety in the approach-motivation-focused group, compared to the avoidance-focused group (6 months follow-up). The authors conclude that previous interventions are overly focused on 'negative' aspects and decreasing avoidance motivation. But the deficits in approach motivation should be targeted specifically by targeting the approach systems and enhancing reward sensitivity, as this shows better overall effects than solely targeting negative symptoms. Furthermore, the authors stated that strengthening the approach system facilitates success experiences, which is yet another cue for the effect of M on S in the therapeutic setting in approach-deprived patients.

Taken together, motivation is an important factor in driving therapeutic progress, especially therapy motivation and approach motivation. Higher levels of motivation are associated with better outcomes, higher engagement in and satisfaction of therapy. Especially autonomous/intrinsic motivation is a key factor here. Lower levels of motivation are associated with decreased outcomes and lack of progress. Examples here are resistance in therapy/to interventions, lack of therapy motivation, especially in substance-abuse disorders, and a general lack of approach motivation across multiple mental disorders. Therapeutic progress and results benefited especially from targeting approach motivation and sensitively adjusting interventions and therapeutic style (directiveness) according to the patient's need.

#### *3.5.3.2.5. Nature of the Function & Mediating Parameters*

The effect of motivation (M) and perceived progress (S) is represented by a logistic growth function with an inert onset, followed by an exponential increase and a final damped effect of motivation on experienced success (Schiepek et al., 2017) (see **Figure 15** (p. 188)). This comprises the enhancing effect of approach motivation on enhanced therapeutic progress, as well as the reducing effect of "negative motivation", like resistance, on progress. Several parameters are assumed to mediate the relation M → S. As already discussed, is the therapeutic alliance (a) an important parameter which can attenuate the negative effects of resistance and low motivation, and further support effects of therapy motivation and its transfer into action (role of alliance can be compared to its role in I → S, see discussion in chapter FUNCTION I → S (P. 164)). Also, the importance of the patients' trait motivation (m) and reward expectations, as well as their self-efficacy beliefs influence state-motivation and the relation to success experience. Several studies finding this effect have already been introduced in chapter FUNCTION M → S (P. 181) . The last mediating parameter is r, encompassing personal resources and skills. These behavioral competencies are important to transfer motivation to actions. A detailed discussion of the way of action of behavioral skills can be found in chapter MEDIATING PARAMETERS ON THE EFFECT I → S (P. 166) . The way of transforming motivation or insight into action and progress is similar. Higher levels of the parameters (a, m, r) increase the effect of motivation on therapeutic progress and dampen the effect of "negative motivation" on reducing progress (Schiepek et al., 2017).

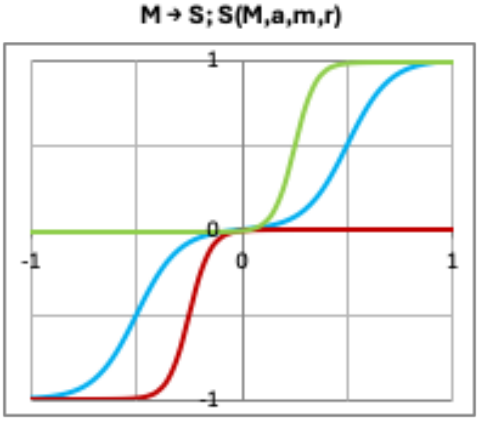



***Figure 15**: Graph of the function M → S (x-axis: input, y-axis: output).*

In conclusion, state motivation is a significant factor in the success of psychotherapy, influencing patient satisfaction, treatment adherence, and overall therapeutic outcomes. The role of motivation in psychotherapy is multifaceted, encompassing patient expectations, perceived therapist empathy, and treatment effectiveness. Therefore, understanding and addressing patient motivation is essential for assessing and optimizing psychotherapeutic change.

#### 3.5.3.3. Open for Discussion: Function M → E

The function M → E is currently not included in our model. In the following, some evidence is reviewed regarding the effect of motivation on emotions.

##### *3.5.3.3.1. Overlapping Constructs & Complex Interaction*

As already discussed in detail in chapter Open for Discussion: Function E → M (p. 156), are motivation an emotion two massively overlapping and interaction concepts. This interaction is not only on a conceptual level but also on a neuropsychological level, as both processes depend on overlapping neuronal circuits (Beall & Tracy, 2017; Cromwell et al., 2020; Lang & Bradley, 2010). Although emotion and motivation have each unique characteristics and aspects, they are too intertwined at the same time, in order to sufficiently detangle specific causal relations. At least on a neurological level. For a more detailed discussion, see chapter Open for Discussion: Function E → M (p. 156).

##### *3.5.3.3.2. Emotion and Motivation and Their Relation to Initiating and Evaluation of Actions*

On a behavioral level, the complex interaction remains existent (Harmon-Jones, 2019; Tretter & Löffler-Stastka, 2018). Both processes are involved in the sequence of initiating, sustaining, and regulating behavior (Wasserman & Wasserman, 2020). They are interacting with many other aspects like attention (Raymond, 2009) or executive control (Pessoa, 2009).

However, different theoretical perspectives seem to share the tendency that motivation initiates action and emotions evaluate the action, e.g. in regard to the fulfillment of needs. Two implications can be drawn from this: first, motivation has rather an effect on emotion regulation in order be able to sustain behavior than on emotions directly, and secondly emotions might influence motivation as they signal to stop or continue a certain behavior. In an evolutionary approach to motivation Gilbert (2015) argues that motivation drives action and emotions are an evaluation of those actions "in pursuing any of these basic motives and biosocial goals, emotions will ebb and flow according to the degree that they are desired and successfully pursued" (Gilbert, 2015, p. 231).

Other theories go even further than characterizing emotions only as indicator for sufficiently fulfilled needs and goals. Scheffer & Heckhausen (2018) argue that emotions are

"prerational forms of values and expectancies that influence the motivational process" (Scheffer & Heckhausen, 2018, p. 92).

And Reisenzein (2014) reasons, based on Weiner's Attribution Theory, that emotions even have a motivational tendency as they are signaling if a specific behavior is good or not, hence should be continued or not. If anything, both cases hint at a motivating role of emotions, rather than an effect of motivation on emotions. However, there still might be a relation between motivation and emotions, as already indicated. Several studies and conceptions suggest motivation as a relevance part of the process of emotion regulation (Tamir, 2016; X. Wang et al., 2017). When pursuing a goal or motive and the according behavior, often conflicting motives and interfering emotions occur. In this case, motivation can enhance emotion regulation in order to down-regulate goal-interfering emotions and keep pursuing the goal-directed behavior. In an attention-focused model of motivation Raymond (2009) describes that motivation monitors "internal emotional and biological states as well as external perceptually assessed conditions" (Raymond, 2009, p. 295) in order to start a regulation process to sustain goal-behavior.

#### *3.5.3.3.3. Summary*

Taken together, although there is no evidence that motivation influences emotions directly, there are some indications that motivation can activate emotion regulation processes, which, in turn, alter emotions. Hence, an indirect relation between motivation and emotions can be assumed. A direct relation remains unlikely, as motivation is more focused on initiating behavior and emotions are "evaluators" of this behavior. In this case, emotions can have a motivational potential, as they indicate the sustaining or stopping of a specific action. This was already discussed in chapter Open for Discussion: Function E → M (p. 156).

Although we thought of a possible effect of motivation on emotions, e.g. higher therapy motivation and higher engagement might facilitate the experience of positive emotions, no such findings or theories exist. In conclusion, the effect of motivation on emotions is unlikely to be relevant in the therapeutic process. The function M → E should not be included in our model based on current findings.

### 3.5.3.4. Open for Discussion: Function M → P

The function M → P is currently not included in our model. The reviewed evidence did not hold any indications to include the relation in future versions of the model.

When thinking about the potential effects of motivation on perceived symptom severity, two perspectives come to mind. The first one would be motivation as an "energizing" and perspective giving attribute, which makes problems seem to be more approachable. However, on the one hand, there is just no evidence for this way of action. More findings hint to the mitigating effects of positive emotions and insight on problem intensity, which are discussed in the chapters Function P → E (p. 193) and Open for Discussion: Function I → P (p. 170) . On the other hand, the perspective-giving attribute is probably better covered with the parameter m, trait motivation. Many studies show the importance of hope and expectancy effects on perceived problems and problem approachability (see chapter Parameter m - Motivation to Change as Trait (p. 124)). Exemplarily the study by Scheidegger et al. (2023) can be used. Treatment motivation (at admission), symptom severity, and hopelessness (at admission and discharge) were assessed in 294 chronic pain inpatients. Hierarchical linear regression analysis showed that lower levels of hopelessness predicted lower levels of symptom severity. Treatment motivation itself did not predict symptom severity.

The second perspective is based on findings where lower intrinsic and higher extrinsic motivation are associated with lower levels of subjective well-being (Bailey & Phillips, 2016; Kelly et al., 2015). Kelly et al. (2015) explain this relation with Grawe's factor of motivational clarification: motivational ambivalence leads to lower well-being, as no explicit track of need-satisfaction can be pursued. In their review, Barkham et al. (2021) also concluded that higher intrinsic motivation leads to lower symptoms post-treatment. However, there is no evidence of a direct effect of motivation on symptom severity. It is more likely that success plays a mediating role here. Higher levels of motivation and engagement lead to more progress in therapy, as already argued in chapter Function M → S (p. 181) . Higher levels of success in turn lead to reduced perceived symptom severity (see chapter Function S → P (p. 221)). As no evidence points to a direct relation between motivation and problem intensity, it is more likely that the relation between well-being (as only quasi-indicator for reduced P) and motivation works via success-experience. That is, low motivation inhibits progress and a lack of progress is associated with increased symptom severity.

Based on the lack of evidence for a direct relation between M and P, and the already included other relations, which cover possible mediating effects of S, we would not recommend including the function M → P in the model.

#### 3.5.3.5. Open for Discussion: Function M → M

The self-enhancing effect of motivation is currently not included in our model. There are almost no studies or theories investigating the possible self-enhancing effect of motivation. Some research concentrates on positive feedback processes of expectations (induction of positive expectations, according to Grawe (2000)). That is, enhanced positive expectations lead to several other positive outcomes. However, these expectations are more related to the parameter m of trait motivation and hope, than to state motivation M. Jochems et al. (2015) investigated the effect of motivation feedback on therapy motivation and engagement. 294 outpatients received monthly motivation feedback from clinicians. However, there was no effect of the feedback on engagement. The authors concluded that "monitoring and discussing the patient's motivation is insufficient to improve motivation and treatment engagement and suggests that more elaborate interventions for severe mental illness patients are needed" (Jochems et al., 2015, p. 3049).

This underlines the assumption that motivation cannot be increased by motivation, in this case tried via feedback. Taken together, there is no evidence supporting the self-enhancing effect of motivation. Hence, we do not recommend including the function M → M in the model.

### *3.5.4. Functions of P - Problem Intensity*

The variable P describes the patient's symptom severity, experienced incongruence or conflicts, as well as problem and stress intensity. Problem intensity is assumed to interact with emotions (E), motivation (M) and success experience (S) in a way that moderate problem intensity enhances negative emotions and motivation and reduced experienced success. All relations are mediated by trait motivation. P → E and P → S are additionally influenced by the capacity of cognitive competencies.

### 3.5.4.1. Function P → E

#### *3.5.4.1.1. Nature of the Function & Moderating Parameters*

| Theory | Reference |
|---|---|
| dysfunctional emotion regulation in disorders | (Bohus et al., 2021) |
| emotion dysregulation as trans-diagnostic factor | (Aldao et al., 2016) |
| **mediating parameters** | |
| cognitive competencies c | |
| motivation as trait m | |

***Table 20**: Theoretical concepts related to P → E.*

The function P → E describes the relation between problem intensity and emotions. Increasing conflict intensity generally triggers distressing emotions. There is even an exponential increase, i.e. the more severe the problem is, the more such emotions will be evoked. **Table 20** (p. 193) summarizes the theoretical concepts related to P → E. **Figure 16** (p. 193) represents the graph of the function.

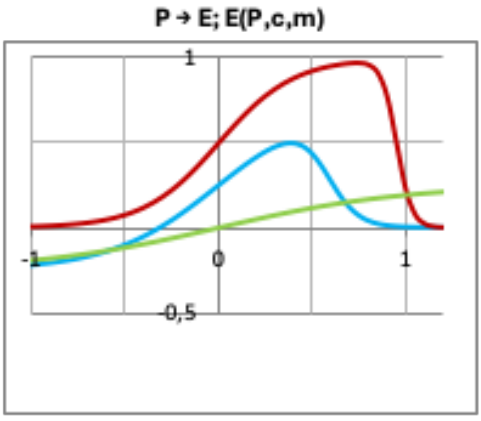



***Figure 16**: Graph of the function P → E (x-axis: input, y-axis: output).*

However, in this case, the function is even more dependent on the mediating parameters than on other relations. Mediating parameters are cognitive competencies c and motivation as trait m (Schiepek et al., 2017). Cognitive competencies refer to the skills of emotion regulation, self-reflection, and mentalization. They also cover the 'structure functions' of the personality in the sense of OPD (Cierpka et al., 2014). Motivation as trait m includes expectations of self-efficacy and problem solving, which highly influence the actual performance of conflict solving. A detailed discussion of both parameters can be found in the chapters PARAMETER C - COGNITIVE COMPETENCIES (P. 108) and PARAMETER M - MOTIVATION TO CHANGE AS TRAIT (P. 124) .

High levels of m and c lead to a rather small, almost linear relation between conflict intensity and stressful emotions. That is, even high levels of problem intensity only elevate negative emotions to a specific extent. I.e. the maximum of E is lower, because more functional coping mechanisms and skills are applied earlier and will reduce negative emotions in time.

A different picture appears in low levels of c and m: an almost exponential increase of negative emotions occurs already at low or moderate levels of problem intensity, due to a lack of proper and in-time regulation strategies. However, at very high levels of problem intensity, negative emotions drop abruptly, leading to an almost inverted U-shaped function. This is caused by the usage of very effective but at the same time dysfunctional emotion regulation strategies, used by patients with low levels of c and m. Such strategies include self-harm, drugs, alcohol, and dissociation (Nijenhuis & Van Der Hart, 2011). The core deficiency here, that leads to such an increase in negative emotions and a following dysfunctional usage of regulation strategies, is an impaired emotion regulation.

#### *3.5.4.1.2. Borderline Personality Disorders as Prototype of an Emotion-Dysregulation Disorder*

A prototypical disorder with minor regulative capacities of c and m is the borderline personality disorder (BPD). Characteristics of the BPD are deficits in emotion regulation and impulse control (= low c), heightened emotional sensitivity and reactivity (Bohus et al., 2021; Daros & Williams, 2019; Gunderson et al., 2018; Sharp & Fonagy, 2015). These aspects lead to very intense and unregulated emotions, problematic behavior like impulsive aggressions, and dysfunctional regulation strategies such as substance abuse, dissociation or self-harm (Bohus et al., 2021; Crowell et al., 2009; Gunderson et al., 2018; Lieb et al., 2004). But not only is the reactivity elevated, and the regulation impaired, those behaviors are even triggered by even minor intense stimuli due to the increased emotional sensitivity (Fonagy & Luyten, 2016; Lieb et al., 2004; Schmahl et al., 2014; Stanley et al., 2018). Neurobiological substrates affirm the psychological symptoms and mechanisms. Patients with BPD show a prefronto-limbic dysfunction, which is related to processes of cognitive control. Further, alterations can be found in brain circuits involved in processes of theory of mind and empathy, like the medio-prefrontal cortex and the tempo-parietal junction (Gunderson et al., 2018; Ruocco & Carcone, 2016). Those areas have already been shown to be involved in processes of emotion regulation and cognitive control (see chapter Neurological Underpinnings and Similarities of the Concepts (p. 114)).

Besides the reduced capacity of emotion regulation, reflected by low levels of c, BPD patients also show reduced expectations in their capacity for problem solving or management of stressful situations. This is reflected in the parameter m of self-efficacy expectations. Several studies showed reduced self-efficacy expectations in BPD samples, especially

regarding effective emotion regulation (Daros & Williams, 2019; Matusiewicz, 2014; Veilleux et al., 2021). Veilleux et al. (2021) found a relation between reduced self-efficacy expectations and increased negative emotions in a borderline sample ($n$ = 50) compared to samples without borderline features ($n$ = 49), current smokers ($n$ = 61) and chronic dieters ($n$ = 92). A one-week ecological momentary assessment was conducted, assessing momentary self-efficacy for willpower, positive and negative affect, tiredness, and distress intolerance, randomly seven times per day. A time-lagged analysis revealed that distress follows periods of low self-efficacy experiences. Another study revealed that emotion regulation self-efficacy influences undertaken risk-behavior as a consequence of negative emotions (Matusiewicz, 2014, $n$ = 74, with $n$ = 29 with BPD). I.e. perceived low efficacy in emotion regulation goes along with more intense (unregulated) negative emotions, which in turn enhances the probability of engaging in risk-behavior - may be as an attempt of regulation the feelings.

Taken together, BPD is conceptualized as an emotion regulation disorder (Bohus et al., 2021; Daros & Williams, 2019). Low regulation capacities and heightened emotional reactivity lead to very intense and insufficiently regulated emotions and associated impulsive behaviors. Hence, a key factor leading to such intense emotions is the lack of emotion regulation capacity, reflected by low levels of c in our model. Additionally, also implicit beliefs about the own problem-solving and emotion regulation capabilities influence the actual impact of distress on negative emotions, by further impairing emotion regulation and the attempts to do so (Daros & Williams, 2019). The parameter m (self-efficacy) maps this capacity. Daros & Williams (2019) describe the relation between c and m: implicit beliefs about emotion regulation efficacy and general self-efficacy (m) lead to a reduced success in regulating emotions. Paired with the usage of dysfunctional strategies and suboptimal timing (c) poor emotion regulation is sustained. These recurring experiences of failed regulation and intense negative emotions enhance the low self-efficacy beliefs again, preserving the negative cycle (Daros & Williams, 2019)

#### *3.5.4.1.3. Emotion Dysregulation as Trans-diagnostic Factor*

However, although the dynamics of the BPD with the mechanisms of c and m can be well mapped with our model, this relation is not specific to BPD. Affective dysregulation has been shown to be a trans-diagnostic phenomenon occurring in many mental disorders on a symptomatic and neurobiological level Gunderson et al. (2018); Santangelo et al. (2018);

Santangelo et al. (2016). Aldao et al. (2016) concludes that emotion regulation deficits can be found across most mental conditions, e.g. in substance abuse disorders, eating disorders (Svaldi et al., 2012), attention-deficit/hyperactivity disorders and psychotic disorders. A systematic review, including 67 studies, showed that increases in emotion regulation capacity led to increased outcomes across various disorders (Sloan et al., 2017). The authors also concluded to characterize emotion regulation as trans-diagnostic factor. Another research group even suggested including emotion regulation as another category within the Research Domain Criteria Framework (Fernandez et al., 2016).

When looking at the relation of problem intensity on distressing emotions (P → E), the moderating effect of emotion regulation (parameter c) and perceived self-efficacy (parameter m) can also be found in other disorders. For example, pain and fibromyalgia patients exhibit an increase in negative emotions due to their physical symptoms, which is moderated by their emotion regulation capacity (Borgne et al., 2017; Dima et al., 2013; Frumkin & Rodebaugh, 2021; Martínez et al., 2015; Pereira et al., 2021; Ziadni et al., 2020). Hence, the impact of the distressing factor (P, problem intensity, in this case pain) on the emotional experience depends on the capacity of emotion regulation c. However, also the *expected mood regulation*, called "Negative Mood Regulation Expectancies" can impact the emotion regulation and with that the development of negative emotions in pain patients (Blaettler et al., 2022)). This equals our parameter m of self-efficacy. Further studies also showed that the stress response depends on the perceived self-efficacy, i.e. higher self-efficacy acts as a buffer against stress. In our model, this means that the higher the levels m, the lower the influence of symptom severity P on emotionality E (Fida et al., 2018; Schönfeld et al., 2017).

Also, depressed patients reveal an impaired emotion regulation (Aldao et al., 2016). Depressed patients reveal a heightened and attenuated reactivity to negative stimuli, i.e. they are 'stuck' in the negative emotions and cannot upregulate themselves properly after being confronted with negative stimuli (Shin et al., 2022). Depressed patients are also more change resistant to positive emotion induction, i.e. not even confrontation with positive stimuli elevates the mood (Barkham et al., 2021; Shin et al., 2022). Hence, the lack of emotion regulation can be seen as one attenuating factor of the disorder, as it leads to an increased sustaining of negative mood and lack of adaptation to positive stimuli. On an even bigger scale, some findings point to the direction that emotion dysregulation might be even a moderator for developing depressive disorders after aversive life events (Abravanel

& Sinha, 2015, cross-section design). However, evidence regarding causal effects of emotion regulation as predictors and maintaining factors of depression after aversive life events is still rare (Cludius et al., 2020).

Summarizing the findings, emotion regulation (c) and the self-efficacy thereof (expectancy effects, m) is an established factor in moderating between distressing events/problems (P) and negative emotions (E). BPD is a prototypical disorder, revealing the predicted relation of problem intensity and emotions with low levels of emotion regulation (c) and self-efficacy expectations (m). But also, other disorders, such as depression, chronic pain related conditions and others, reveal a similar mechanism. In conclusion, the quality of emotion regulation might be a general indicator of the effectiveness of the treatment and the function P → E can work as an important manifestation of the consequences of sufficient emotion regulation.

### 3.5.4.2. Function P → M

| Theory | Reference |
|---|---|
| incongruence as a driver for change | (Margraf & Schneider, 2018a; Sack, 2019) |
| learned helplessness | (Abramson et al., 1978) |
| **mediating parameters** | |
| motivation as trait m | |

***Table 21**: Theoretical concepts related to P → M.*

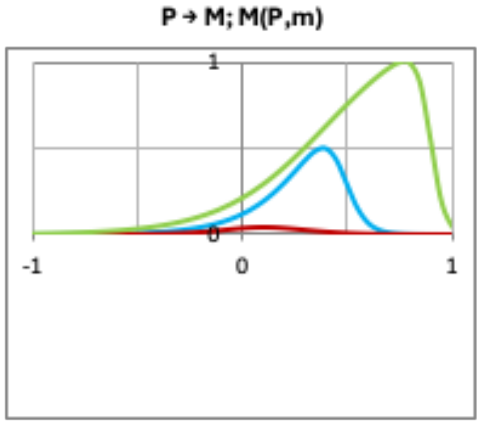



***Figure 17**: Graph of the function P → M (x-axis: input, y-axis: output).*

The function P → M describes the relation between problem intensity/symptom severity and motivation to change. That is, the higher the burden or psychological strain (P), the higher is the urge to change (M) (Schiepek et al., 2017). At the beginning, there is almost an exponential increase of motivation in relation to problem intensity. However, it is not endless: at a certain extent of symptom severity, the burden seems to be unmanageable - a maximum is reached, and motivation drops. **Table 21** (p. 198) summarizes the theoretical concepts related to P → M. **Figure 17** (p. 198) represents the graph of the function.

There is a wide range of evidence regarding the different aspects of the relation of P → M. The perspectives of problem intensity as a driver for motivation, the paralyzing effect of very severe problems and the moderating effect of the motivation as trait parameter are discussed.

#### *3.5.4.2.1. Dependency of Motivation to Change on Problem Intensity*

The central assumption of the function P → M is that suffering is a major driver of motivation to change. In a therapeutic setting, this means that the higher the suffering caused by the mental disorder or its consequences, the higher the motivation to seek psychotherapeutic help and to engage in the psychotherapeutic process (Sack, 2019; Slunecko, 2017). Margraf & Schneider (2018a) explain the relation between suffering and change-motivation with an incongruence of desires, needs and reality. This incongruence works as a driver to achieve congruence. Grawe (2000) describes a similar mechanism within his Rubicon

model, his concept of avoidance goals, and the relation between suffering as a catalyst for a desire to get better. Schulte (2015) put it as follows "generally, suffering is often viewed as the driving force of treatment since it fuels the desire to change something and can be seen as a precondition for problem awareness" (Schulte et al., 2015, p.2; translation by Scheidegger et al., 2023).

Besides the theoretical considerations, also quantitative research supports the assumption P → M. One the one hand, questionnaires assessing treatment motivation also include questions about problem intensity (H. Schulz et al., 2003). On the other hand, there are findings showing a relation between problem intensity and treatment motivation. For example, do more patients seek help with higher levels of suffering (Ryan et al., 1995; Schweickhardt et al., 2005; van Beek & Verheul, 2008). Patients with personality disorders seem to have more treatment motivation compared to non-personality disorder patients, which can be partly attributed to the higher level of symptom distress (van Beek & Verheul, 2008).

#### *3.5.4.2.2. Paralyzing Effect of Severe Problems*

However, the motivation driving effect of symptom distress is not endlessly. At a certain degree, problems seem non-solvable, and symptoms are not bearable anymore (maximum of the function). Helplessness is spreading and displacing motivation. Expectations of failure are more present than motivation to change (Mulder et al., 2014; Schiepek et al., 2017). This can be compared to the state of learned helplessness by Abramson et al. (1978) (see chapter Parameter m - Motivation to Change as Trait (p. 124) for a discussion of learned helplessness, self-efficacy and expectancies as part of variable m). Some evidence points to the role of external motivation and motivation as trait. Based on its stability, motivation to change has trait characteristics (Ponzini et al., 2019). So do high symptom anxiety patients benefits from motivational interviewing (Westra et al., 2009). I.e. when problem intensity is so high that it paralyzes, external motivation helps to get a glimpse of perspective and 'external hope' (Frank & Frank, 1993). But even more influential on maximally bearable problem intensity is the effect of motivation as trait.

#### *3.5.4.2.3. Moderating Effect of Motivation as Trait (m)*

Motivation as trait includes learned self-efficacy, reward expectations and positive expectations regarding the own development (Maddux & Kleiman, 2016; Schiepek et al., 2017) (see also chapter Parameter m - Motivation to Change as Trait (p. 124)). Depending on a

person's expectations of his/her own competencies to solve problems, she/he can handle more or less severe issues before feeling overwhelmed. Hence, the trait parameter m defines the 'turning point' of the function, i.e. the point where problem intensity switches from being motivation enhancing to evoking helplessness. Bandura & Locke (2003) reviewed of nine meta-analyses assessing the effect of self-efficacy (m) on motivation. The authors conclude: "Converging evidence from diverse methodological and analytic strategies verifies that perceived self-efficacy and personal goals enhance motivation and performance attainments" (Bandura & Locke, 2003, p. 87).

That is, the higher the perceived self-efficacy, the higher the general motivation to solve problems and reach goals. Breuninger et al. (2019) assessed this relation further with an increased focus on symptom severity. The meta-analysis revealed that changes in self-efficacy related cognitions work as mediators of symptom change in agoraphobic patients. The authors classify the self-efficacy cognitions as 'increased positive conditions'. It was shown that they have a larger mediational role between symptoms and interventions, compared to the reduction of negative dysfunctional conditions. Hence, enhancing perceived self-efficacy leads to an increased symptom reduction, compared to a reduction in negative dysfunctional conditions. Explained within the scopes of the function P → M, that is, higher self-efficacy allows to handle even severe problems, among other through increased motivation to change, and ultimately reduces symptom strain. Farley (2020) affirms this central relation of self-efficacy in a review assessing patients with chronic conditions. The review revealed that higher levels of self-management strategies enhance outcomes. The key mechanism of those strategies lies in the perceived self-efficacy. Hence, self-management strategies support self-efficacy and increased self-efficacy ultimately leads to lower symptom levels. Especially in patients with chronic conditions, motivation is an important factor, due to the high burden of the long-lasting symptoms.

Self-efficacy can work as an important driver for long-lasting change motivation, especially in severe conditions. Additionally, people with higher levels of self-efficacy are also better at problems solving and keep sticking to the task, even when it is hard (Maddux & Kleiman, 2016). Furthermore, self-efficacy cannot only help to manage already existing symptoms, it can also work as a protective factor when facing challenging life events. The findings are in line with the function P → M. High levels of self-efficacy allow people to feel in charge and capable of confronting even severe problems (Sheeran et al., 2016). Hence, keep them motivated to go through the straining period and uphold the positive expectations in

developing and changing to the better. In line with this, Gallagher et al. (2020) showed that positive expectancies and especially higher levels of self-efficacy worked as predictors for trauma resilience. I.e. high levels of self-efficacy and positive expectancies can protect people from developing a PTSD after being confronted with traumatic events. In psychotherapy, motivation and self-efficacy are also important parameters, as they facilitate application of coping strategies and health related behavior (Caviness et al., 2013; Ryan & Deci, 2020).

In contrast, do low levels of motivation to change and self-efficacy make even minor problems seem unsolvable and quickly evoke a state of helplessness (Maddux & Kleiman, 2016), which describes the learning that the own actions do not have an effect, and one therefore stopped acting, i.e. low self-efficacy (compare to the concept of learned helplessness by Abramson et al., 1978). The stereotypical example here is depression, where even the smallest task (e.g. getting out of bed) seems unsolvable huge and leads to a total exhaustion and almost paralyzation. In the case of low levels of m also minor hurdles lead to stopping of activities, non-pursuing of goals or not even an engagement in problem solving, even though the intention was there initially.

An overlapping concept here worth mentioning is procrastination (Steel, 2007). Procrastination is a self-regulation style or even failure, which describes the situation where even minor problems can stop people from pursuing goals or finishing tasks. A main predictor here is low self-efficacy and achievement motivation (Steel, 2007; Van Eerde, 2003). But not only in task or work-related settings, but also in health-related activities has trait procrastination been shown to lead to smaller intentions to engage in health behavior, which is mediated by the perceived health related self-efficacy (Sirois, 2004; Sirois et al., 2023). The authors conceptualized procrastination here as a self-regulation style related to behavioral control. A recent study showed that high self-efficacy led to engagement in more preventive behaviors during the covid pandemic and better mental health (Yıldırım & Güler, 2022). Low levels of self-efficacy were related to more mental health issues. Also, in chronic pain patients, low efficacy was one of the most negatively affected domains, and significantly lower compared to healthy control groups (Burke et al., 2015). Further, higher self-efficacy was associated with reduced depressive symptoms, indicating the mediating role of self-efficacy in symptom severity (Kardash, 2024). Similarly, in patients with chronic gastrointestinal disease, positive illness perception, which is linked to increased

self-efficacy, was found to reduce anxiety symptoms, showcasing the impact of self-efficacy on symptom management (Z. Wang, 2023).

Taken together, self-efficacy expectations are central to pursuing goals, overcoming hurdles and sustaining the needed motivation. Therefore, it is an important parameter in the psychotherapeutic change process, which is characterized by overcoming difficulties. Increasing self-efficacy through therapy is essential and helps to transfer the therapeutic material to daily life. Especially in depression, anxiety and substance abuse disorders low-self efficacy is a central disorder-sustaining mechanism (Maddux & Kleiman, 2016). There are different ways to work on self-efficacy. CBT, for example, a stepwise approach of building up tiny behavioral tasks to achieve small moments of success and slowly rebuild efficacy expectations (Margraf & Schneider, 2009a). But many other interventions exist. Mikkelsen et al. (2017) for example, showed that physical exercise interventions can increase mood and motivation (i.e. maintain adherence to goal behaviors). The primary mechanism here was an enhanced self-efficacy perception.

#### 3.5.4.3. Function P → S

| Theory | Reference |
|---|---|
| cognitive defusion | (Hayes et al., 2014) |
| psychological flexibility | (Kashdan & Rottenberg, 2010) |
| ADHD as a prototypic disorder | |
| **mediating parameters** | |
| cognitive competencies c | |
| motivation as a trait m | |

***Table 22**: Theoretical concepts related to P → S.*

The function P → S describes the impact of problem intensity on experienced success. That is, higher levels of problem intensity or symptom severity (P > 0) reduce the perceived success and progress of therapy (Schiepek et al., 2017). In turn, a decrease in problems or symptoms (P < 0) can be perceived as progress and success (S > 0). **Table 22** (p. 202) summarizes the theoretical concepts related to P → S. **Figure 18** (p. 203) represents the graph of the function.

The relation is depicted with an inverse logistic function, with the steepest effect gradient of P on S at P = 0. This is the changing point, where patients experience an increase of problems (P > 0) vs. a decrease in problems (P < 0).

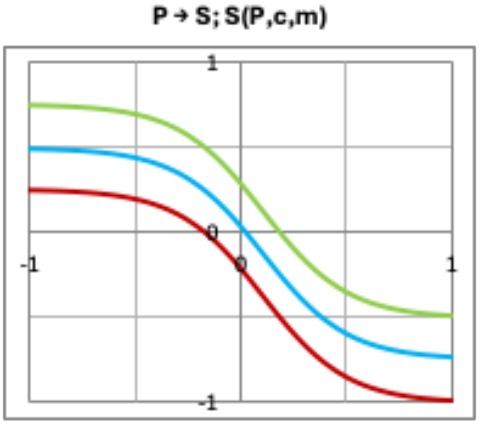



***Figure 18**: Graph of the function P → S (x-axis: input, y-axis: output).*

Cognitive competencies (c; e.g. self-regulation, emotion regulation, cognitive defusion) and motivation as trait (m; e.g. reward and self-efficacy expectations) are assumed to be mediating parameters. Higher levels of c and m attenuate the demotivating effect of higher problems on progress experience and promote success experience following problem solving. Taken together, people with high levels of c and m are more robust against symptom exacerbations, relapses or personal crises and are better at attributing problem solving/symptom decrease as success. People with low levels of c and m are disturbed already with a slight increase in symptom severity and easily lose the sense of progress - also when symptom levels decrease.

#### *3.5.4.3.1. Mediating Role of c*

As already mentioned, the parameter c describes a person's cognitive competencies, capacity of self- and emotion regulation, as well as the ability for metacognition. In the case of P → S, cognitive competencies have a regulating role as they allow a person to distance him/herself even though the symptoms seem to be overwhelming. In the sense of acceptance and commitment therapy, this process is called *cognitive defusion* (Hayes et al., 2014). Generating a distance between the problem, the self and worrying thoughts allows other processes to take place: generating relief by decreasing importance, urgency and experienced pressure of the problem by the distancing process, and with that making room for taking a new perspective (Bernstein et al., 2015).

This distancing process is impaired in many disorders, such as depression and anxiety disorders (Aydın & Yerin Güneri, 2022; Zettle et al., 2011). The cognitive realm in such disorders with a lack of cognitive defusion is characterized by a special rigidity (Kashdan & Rottenberg, 2010) which can be expressed in cognitive distortions or a rigid attribution style. A recent review showed that expectations are based on previous experiences - however, in depression the processing loop of adjusting expectations based on new experiences

is distorted in such a way, that negative expectations are maintained - regardless of experiences (Kube et al., 2020). On a neuropsychological level, this phenomenon can be attributed to a distorted reward sensitivity in depressed populations, as they are more open to negative and less open to positive reward. When looking at the function P → S, this means people with a decreased capacity for cognitive competencies and increased negative cognitive distortions experience elevated levels of symptoms or problems as more success dampening than people with more functional cognitive strategies. In this population also a decrease in problem intensity is not experienced as massive progress, as the distorted reward processing loop keeps up the negative expectations.

Another concept describing the same phenomenon is the emotional context insensitivity hypothesis (Caouette & Guyer, 2016). It characterizes the tendency of depressed populations to be immune to external emotional input, sustaining a negative expectancy bias and going along with lower cognitive flexibility. One further cognitive distortion that can explain the elevated experience of problem intensity and the lack of progress experience is a specific attribution style which can be found in some clinical population, such as depression (Graham, 2020). Similar to the distorted reward processing loop, and the 'cognitive triad' postulated by Beck, which can be found in depression (Beck, 1979; 'I am bad, the world is bad, the future is bad'), the attribution style keeps up negative self- and success expectancies. Graham (2020) expatiates that in such dysfunctional attribution styles, success is attributed externally and failure internally – vice versa, to the functional attribution style.

That means, in order to profit from problem solving the success should be attributed internally. If this is the case, as in populations with higher levels of c, a decrease of problems (⬇️P) is experienced as success (⬆️S), because the cause of the effect is attributed internally. In depressed populations with lower levels of c, success experience does not take place, even though the symptoms decrease - due to a lack of awareness, low reward sensitivity or because the cause of the effect is attributed externally. This dysfunctional attribution style is theoretically closely related to the hopelessness model of Abramson and the corresponding model of learned helplessness of depression (Abramson et al., 1978; Graham, 2020; Seligman et al., 1979; Weiner, 2018) (also introduced earlier, see chapter Parameter m - Motivation to Change as Trait (p. 124) . A meta-analysis by Huang (2015), including 52 studies with almost 12'500 participants, confirmed the impact of a dysfunctional attribution style on mental health. A depressive explanatory style (i.e. attributing failures internally

and success externally) was moderately related to depressive symptoms subsequent to negative events.

#### *3.5.4.3.2. Mediating Role of m*

Although cognitive distortions and attributions styles influence the moment-to-moment experience and interpretation of success and symptoms, their relation to outwearing expectations is obvious and confirmed in multiple cases (e.g. Graham, 2020). All - attribution styles, trait motivation and hopelessness, are related to self-efficacy experience and -expectations (Graham, 2020). In contrast to parameter c, which describes a person's cognitive competencies and their flexibility or rigidity to observe, experience and interpret symptoms and success in different perspectives, the parameter m describes a general trait-like motivation to change; comparable to a point of view, which influences the perspective on development and problems. As already described in chapter PARAMETER M - MOTIVATION TO CHANGE AS TRAIT (p. 124) , m includes trust and confidence in the process of a positive self-development, having solid self-efficacy expectations which keep up 'hope' and motivation, even when problems hinder the development or hurdles are in the way (Frank, 1974; Schiepek et al., 2017).

Similar to the role of m in P → M, high levels of m help a person keep up trust in a good development, even though a lot of symptoms and problems are present at the moment. In P → S, this means that even though symptom levels are high (P⬆️), success and progress experience is not reduced as much (S⬇️), compared to people with low levels of m. In this case, even smaller increases in problem intensity lead to a huge decrease in experienced progress, as the trait-like motivation to change, the outlasting trust in the process and a good development is missing. Small hurdles are seemingly bigger for people with low levels of m, and with that also the experiences progress is more dependent on the acute symptom level (Schiepek et al., 2017).

The effect of m on problem-solving capacities, with the influence of related self-efficacy expectations and motivation, was already discussed in chapter PARAMETER M - MOTIVATION TO CHANGE AS TRAIT (P. 124) . Problem solving as a process can be used as a prototypic example for testing hypothesis regarding the handling of problems occurring in the human change process. As the related factors of self-efficacy expectations, motivation and trust in the process are quite similar. In a systematic review including over 46 studies, Johnson et al.

(2017) investigated the factors which influence the experience of failure as distressing or not: higher self-esteem, a more positive attribution style and lower perfectionism led to a reduced distressing impact of failures. These factors are comparable to the parameter m, and show the relation to the parameter c, in a way that if both parameters are adequately developed, problems are not perceived as severe, and the experience of progress is less damped by (small) setbacks or hurdles. Another study by Parker et al. (2016) compared the experienced success in course performance of students with reduced control beliefs, after an attributional retraining course (N = 466). The results showed that students with low control beliefs profited from the attributional training and showed increased perceived course success. Although the control believes are in between the parameters c and m, as they are part of an attributional style (c), but also related to outlasting success and self-efficacy expectations (m), the result supports the assumed relation in P → S.

#### *3.5.4.3.3. ADHD as Prototypic Disorder*

The clinical relevance of the relation P → S can be demonstrated with the clinical picture of attention deficit hyperactivity disorder (ADHD). ADHD is characterized by limitations in executive functions, especially attention, concentration, metacognition and emotion regulation (Drechsler et al., 2020). Typical symptoms include behavioral problems, impulsivity, and hyperactivity (Sayal et al., 2018). Within the scope of our model, these factors can be integrated in the parameter c, i.e. ADHD is characterized by low levels of cognitive competencies.

Related to the behavioral difficulties, patients with ADHD often have a long history of failures, due the behavioral and regulative difficulties, which condense in low levels of self-efficacy, negative self-statements and an internal attribution style of failure (Gawrilow, 2023), i.e. within the scope of our model this would be reflected in low levels of m. The results are low self-efficacy expectations, an internalizing attribution style of failures and restricted cognitive competencies to regulate behavior, emotions and experiences. Studies show that ADHD patients have higher levels of cognitive distortions (Strohmeier et al., 2016) and increased levels of learned helplessness, when comparing unmedicated to medicated young males with ADHD (Milich, 1994).

The relation P → S captures this dynamic optimally: with low levels of c and m, i.e. deficits in emotion regulation and metacognition, paired with dysfunctional attribution styles and low self-efficacy expectations make problems seem to be overwhelming easily and

progress is not experienced as such, as it is mostly attributed externally and damped by easily increasing problem intensity. This is a typical picture reported by ADHD patients, that it does not matter how hard they try, the results are often not good enough and they end up in being frustrated and helpless over the years (Blanke et al., 2021; Gawrilow, 2023; Ryffel-Rawak, 2016).

#### *3.5.4.3.4. Evidence on the Success Reducing Effect of High Symptom Severity*

Although many theories support the relation P → S, and many studies affirm the moderating effects of c and m in the relation, clinical evidence for the relation P → S is not very comprehensive. One main hypothesis of P → S is that higher symptom severity reduces the experienced therapeutic progress. Up to date, we could not find process-based studies investigating setbacks in psychotherapy due to increases in symptoms. Although, what can be found is evidence that reduced symptom severity is taken as a sign of progress in psychotherapy (already discussed in chapter VARIABLE P - PROBLEM INTENSITY (P. 80); see also Barkham et al., 2021). However, the problem with this evidence is lacking an *individual* measure for *perceived* progress. The reduction of symptoms is used as an *objective* measure for therapeutic progress. So even though this kind of evidence supports the general interpersonal effective direction of P → S, studies investigating the intrapersonal effect of symptom reduction in perceived progress are needed.

#### *3.5.4.3.5. Conclusions and Recommendation: Practice-Based Relation with Missing Precise Evidence*

Taken together, the relation P → S reflects the logical and comprehensible effect of setbacks and increased problems on reduced success experience. There are many theories supporting the relation, and many studies supporting especially the mediating effects of c and m. Motivation, expectation and self-efficacy beliefs have been shown to have an impact on problem solving results and especially on the estimation of which problems are perceived as solvable. Hence, which problems can be solved and with that can contribute to a success experience. It was also shown that functional attribution styles and better emotion regulation capacities impact the weight of failures on well-being and, specifically, progress experience. However, as already mentioned, there are lacking particularly clinical studies investigating the temporal effect of problem/symptom increase or decrease on the *perceived subjective* experience of progress. Also, the other side of the effect, i.e. increases in problem

solving (P⬇) do also increase progress experience, needs more clinical studies to be sufficiently supported. Though, it must be said that those hypotheses are already used and perceived as useful in clinical practice. So do various directions (e.g. DBT, CBT) of psychotherapy use homework, appreciation, small behavioral experiments/tests to establish success experiences, to increase problem solving capacity and to practice functional attributional styles (Margraf & Schneider, 2009a). The gap between research and practice crystallizes here again. So, although there is not enough clinical evidence at the moment to support the relation P → S fully, we would still suggest keeping the function in the model, as it covers an important aspect of human change and is backed up by clinical practice. However, future validation studies should explicitly investigate the temporal aspects of relation P → S with a focus on subjective progress experiences, in order to deliver the clinical evidence needed.

#### 3.5.4.4. Open for Discussion: Function P → P

The function P → P is currently not included in the model. The function would describe a self-enhancing effect of problem intensity. An increase in symptoms could be perceived as a massive strain, which in elevates, in turn, the experienced levels of symptom and problem intensity. Cognitive competencies (c) could work as a mediating factor, as the included competencies, like metacognition and emotion regulation, might dampen the self-enhancing effect. I.e. people with high levels of cognitive competencies would experience a smaller self-enhancing impact of increasing problem intensity.

Trans-diagnostic mechanisms, like rumination (Nolen-Hoeksema et al., 2008) or phobophobia in anxiety disorders (Perotta, 2020), could be reflected by the function P → P. These mechanisms work as a motor of viscous self-enhancing circles. However, as already discussed in chapter FUNCTION E → E (P. 134), it is more likely that this effect takes primarily place on a level of emotions, which in turn alters the experienced problem intensity. Hence, regarding a parsimonious model development, the self-enhancing effect is sufficiently covered indirectly over the functions of E → E (covering vicious cycle mechanisms like rumination), E → P (effect of the negative self-enhancing impact of emotions on problem intensity), P → E (effect of problem intensity on negative emotions) and also P → S (reduced progress by increased symptom severity). On the one hand, this allows a more minimal model. On the other hand, the indirect implementation of the effect P → P implies a

reasonable time delay, i.e. changes occur primarily on an emotional level, before impacting higher-level symptom complexes.

Taken together, based on the lack of current findings and temporal associations between symptom experience and emotions, we would not recommend including the function P → P to the model at the current time.

#### 3.5.4.5. Open for Discussion: Function P → I

The function P → I is currently also not included in the model. It would describe the relation between problem intensity and levels of insight. The most probable relation would a facilitating effect of higher levels of problem intensity on the insight process, as a certain motivation and emotional activation needs to occur in order to engage in an insight process. Similar to the function E → I, it might lead to high levels of problem intensity not to a further facilitation of insight, but to a stagnation, as a certain level of problem intensity is overwhelming and paralyzing.

Mechanisms and theories related to this function describe the relevance of suffering and emotional activation in order to develop another inner quality within the insight process. Grawe (2000) summarized this in his postulated mechanism of problem actualization. Humanistic and psychodynamic therapies underline the relevance of the direct experience in the here and now (Rogers, 1958; Yalom, 2010). The emotion-focused therapy, with its orientation at painful experiences, is representative of this mechanism.

However, the similarity between the functions P → I and E → I is quite high. Most of the mechanisms explained are already reflected in the other functions, including emotions. Which are also in relation to problem intensity and insight. Hence, similar to P → P, does the model already include an indirect effect of problem intensity on insight, but with a certain temporally delay. The processes around problem actualization are covered by E → I and I → E. The indirect relation between I and P occurs over P → E and E → P. The possible motivating effect of problem intensity on engaging in the insight process is covered by P → M and M → I, with the same temporally delay.

Taken together, there is a probable and reasonable relation between problem intensity and insight, which is currently mostly underlined by theoretical models. Empirical Evidence is missing. Since our model already depicts an indirect effect of P on I, we would not recommend including the function P → I at this time. This supports an economic model

development. If more empirical evidence supports the function in the future and emphasizes its (temporal) importance in the therapeutic process, consideration may be given to including the relation P → I in the model.

### *3.5.5. Functions of S - Success*

The variable S describes the patient's feeling of therapeutic progress and success experiences (Schiepek et al., 2017). S is assumed to interact with emotions (E) (⬆S reducing negative emotions), insight (I) (setbacks and progress enhance insight), motivation (M) (⬆S enhancing motivation), problem intensity (P) (⬆S reducing experienced problem intensity) and itself (S) in an autocatalytic way. Involved mediating parameters are motivation as trait, cognitive competencies and behavioral competencies.

#### 3.5.5.1. Function S → E

| Theory | Reference |
|---|---|
| reciprocal relation of success and happiness | (Lyubomirsky et al., 2005) |
| therapeutic progress as self-actualization | (Rogers, 1957) |
| **mediating parameters** | |
| motivation as trait m | |

***Table 23**: Theoretical concepts related to S → E.*

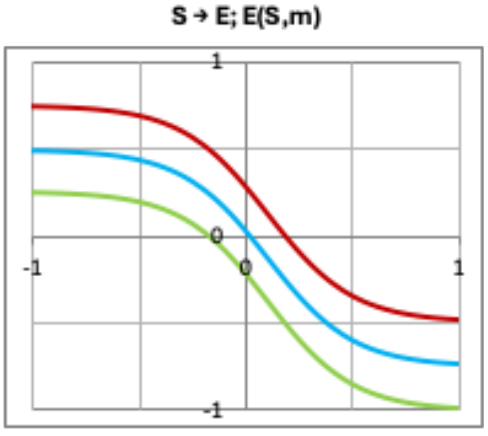



***Figure 19**: Graph of the function S → E (x-axis: input, y-axis: output).*

The function S → E describes the effects of success experience and therapeutic progress on emotions, i.e. elevated levels of success experience reduce negative and enhance positive emotions. In turn, are negative emotions intensified by setbacks, failures and a lack of therapeutic progress. The relation is depicted by an inverse logistic function with the steepest gradient in a moderate range of success (Schiepek et al., 2017). **Table 23** (p. 210) summarizes the theoretical concepts related to S → E. **Figure 19** (p. 210) represents the graph of the function. Trait motivation and self-efficacy (m) mediate the effect of success experience on emotionality. The higher

one's positive expectations to success, the more a person attributes success internally, the higher are the activated levels of positive emotions. With high levels of m, setbacks are attributed more externally and hence do not activate worrying emotions so much. Vice versa, if someone attributes failures more internally and success more externally and has low self-efficacy expectations, the more negative emotions will be evoked by failures and the less positive emotions will occur after progresses.

When looking at the empirical and theoretical background, much evidence supports the positive emotion enhancing effect of success. A big meta-analysis by Lyubomirsky et al. (2005) investigated the reciprocal effect between success and happiness, finding that there are effects in both directions: success evokes happiness, but also does positive affect support success (see chapter FUNCTION E → S (P. 150)). Smaller studies showed the reciprocal effect as well: positive emotions act as precursors of therapeutic change, increase throughout therapy and are related to therapeutic outcomes (as a sign of progress) (Crenshaw et al., 2023; McNeil & Repetti, 2022; Santos et al., 2019).

On a theoretical level need-oriented concepts formulate hypotheses that are covered by S → E. The core of all of them is that therapeutic progress, success and goal achievement in therapeutic context is a step into the direction of self-actualization, which evokes - when taken - positive emotions. Hence, positive emotions are a sign of getting closer to need satisfaction and self-actualization. Supporting and enhancing self-actualization is one of *the* goals in psychotherapy in humanistic oriented and also cognitive-behavioral therapies (Kaufman, 2023). The phrase and concepts go back to Rogers (1957, 1958) in the context of psychotherapy. Grawe (2000) integrated the process of getting aware of needs and taking the steps of getting closer to satisfaction into his integrative model of psychotherapy as well. Maslow (1950) coined the term in the context of personality psychology within his model of substantial psychological needs. Ryan & Deci (2001) picked up the same concept within their self-determination-theory (SDT), where the satisfaction of the basic needs (autonomy, amongst others) leads to positive affect and ultimately general well-being and happiness. Taken together, the positive effects that are assumed to occur when a step into the direction of self-realization and self-actualization is taken, is one of the central assumptions in many psychotherapeutic orientations. This builds on the basic idea of psychotherapy, which aims to improve satisfaction of needs and work on growth and personal development. Therefore, therapeutic progress is more than just a reduction in suffering and

symptoms (also an important mechanism covered throughout the model, e.g. P → E, E → P, S → P).

The function assumes motivation as trait to be a mediating parameter. I.e. the higher the motivation to change and the self-efficacy expectations are, the more positive emotions are evoked by progress and the less impact have setbacks. The main mechanism here is the effect of self-efficacy expectation on the development of a functional or dysfunctional attribution style, hence attributing success internally (functional) or externally (dysfunctional) and setbacks externally (functional) or internally (dysfunctional). For example, depressed patients show (with generally low self-efficacy expectations and a tendency to learned helplessness; Bandura & Locke, 2003) more pessimistic goal achievement predictions and biased anticipated positive emotions associated with goal progress, compared to non-depressed individuals (Anderson et al., 2023). I.e. higher depressive symptoms, which represent lower self-efficacy expectations (m) influence anticipated positive emotions in the case of goal achievement. Self-esteem as another big concept, falling into the aspects covered by motivation as trait, does also show to influence the enhanced experience of pleasant feelings (Baumeister et al., 2003). This means that for people with high levels of m, smaller or less intense events are needed to trigger positive emotions. A more detailed background to the mediating effect of motivation as trait in the case of self-efficacy expectations and success orientation can be found in the chapters Parameter m - Motivation to Change as Trait (p. 124), Function P → M (p. 198) (m) and Function P → S (p. 202) (m). A deliberated theoretical and empirical background was already covered there.

In summary, S → describes an important mechanism in psychotherapy, as it reflects the effect of the basic assumption of self-actualization. With its focus on the positive effect of self-development, S → E represents a counterpoint to the pure reduction of suffering.

### 3.5.5.2. Function S → I

| Theory | Reference |
|---|---|
| quasi-experimental character of successful behavior | (Leahy, 2017; Schiepek et al., 2017) |
| anxiety disorder as prototypic disorder | |
| **mediating parameters** | |
| cognitive competencies c | |

***Table 24**: Theoretical concepts related to S → I.*

The function S → I describes the insight and information generating effect of success experiences and progress. **Table 24** (p. 213) summarizes the theoretical concepts related to S → I.

S → I is depicted by a symmetric logistic growth function with an inert onset at low levels of success, followed by an exponential increase at mid-levels of success and a damped effect of S on I at very high levels of success. The relation and function look alike vice versa for low, mid and high levels of failure and setbacks. Cognitive competencies, such as mentalization, information processing and capacities for self-/behavior-reflection, represented by the parameter c, mediate the effect of S on I. Graphically speaking increases the steepness of the function with higher levels of c, i.e. the more cognitive competencies a person has, the more insight can she/he generate from success or failure experiences. **Figure 20** (p. 213) represents the graph of the function.

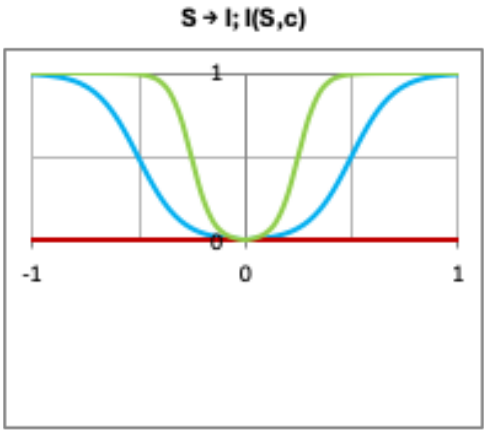



***Figure 20**: Graph of the function S → I (x-axis: input, y-axis: output).*

#### *3.5.5.2.1. Progress and Insight*

Progress is an information source for how problems can be solved. Reflecting on aspects which made therapeutic progress possible gives insight into possible facilitators and helpful strategies. The relation between successful behavior change and altered mental experiencing and functioning can be seen as a kind of quasi-experimental attempt (Schiepek et al., 2017). Changes in behavior act as independent and psychological changes as a dependent variable. In cognitive-behavioral therapy, behavioral experiments are a common tool for

treating anxieties, depression and obsessive-compulsive disorders, among others (Kaczkurkin & Foa, 2015; Leahy, 2017). In behavioral experiments, patients are asked to examine their reality constructions, beliefs and cognitions in order to shatter them if necessary and to acquire new insights. This, in turn, opens up new options for action. For example,

> *The therapist might invite the patient to test the belief that the consequences of not getting approval will be disastrous. This testing would involve behavioral experiments such as assertiveness exercises, through which the patient learns that experiencing disapproval (or giving disapproval) often results in no change in real life. (Leahy, 2017, p. 5)*

Hence, the altered behavior is the intentionally changed independent variable, leading to changes in cognition and emotions (i.e. changes in the independent variable). The latter should be compared with previous fears, cognitions and expectations and thus put to test. In their analysis of the relation between insight and behavior change, Kuncewicz et al. (2014) argue, that insight can be a starting point for engaging in new behavior (discussed in detail in chapter FUNCTION I → S (P. 164)), but also a consequence of changed behavior. That means doing new things can evoke insight. The authors argue:

> *Hill and O'Brian (1999), as well as Gelso and Harbin (2007), suggest that the relationship between insight and behaviour change is more synergic, rather than automatic […] insight detached from action may turn out to be temporary, and therefore of limited usefulness. Action in some sense 'expands' insight, broadening it to include additional modalities (e.g. motor-verbal), thanks to which insight can take a form of a more stable mental schema and be better integrated with the patient's concept of self […]. (Kuncewicz et al., 2014, p. 13)*

Kuncewicz et al. (2014) further discuss emotion regulation as a possible way of action, translating behavior change into insight. They assume the combination of expressing emotions in a new way (as a part of the therapeutic progress and behavior change) in combination with self-reflection and reflexive processing to increase the effectiveness of the person's emotion regulation capability (Kuncewicz et al., 2014; Rottenberg, 2017). In terms of our model, this is included in the parameter c, cognitive competencies and emotion regulation. c is assumed to influence the steepness of the function, i.e. Higher levels of cognitive competencies allow more insight to be gained from even smaller progress and setbacks.

#### *3.5.5.2.2. Anxiety Disorders as Example*

> *One has to recognize in order to keep. – Ido Portal*

Anxiety disorders, especially the generalized anxiety disorder (GAD) works as a good example here. It is characterized by a low uncertainty intolerance, strong tendencies for worry,

dysfunctional cognitive strategies like cognitive avoidance and catastrophic misinterpretations (Hebert & Dugas, 2019). These characteristics can be summed up as low levels of cognitive competencies (parameter c) in the terms of our model. fMRI studies have already shown an altered activity in the areas of the ventromedial prefrontal cortex, which is involved in cognitive processes included in parameter c (see chapter Neurological Underpinnings and Similarities of the Concepts (p. 114)) (Dymond et al., 2015). Central treatments for GAD are problem solving training and imaginal exposure, focusing on increasing uncertainty intolerance (Hebert & Dugas, 2019). The assumed mechanism of those interventions is to increase cognitive competencies to tolerate the uncertainty state better, to ultimately acquire new experiences out of those hard to stand situations.

Those interventions for GAD reflect the assumed way of action of the function S → I. Insight can only be gained out of therapeutic progress and solved problems when enough cognitive and self-reflection capacity is there. Even when a new behavior (as a sign of progress) occurred, but the patient does not reflect on it or does not even recognize it, no substantial insights can be made and transferred to future sensations, cognitions, and behavior. So, this reflection process is necessary to gain insight out of progress or setbacks. GAD-patients often avoid reflecting on difficult situations, to avoid negative emotions and more worry (experiential avoidance), but also tend to oversee progress due to overly present worry (Hebert & Dugas, 2019; Hofmann & Hay, 2018). Both fall under the term cognitive fusion, which is a sign of low cognitive competencies, and leads to an over-identification with cognitions or emotions and hence prevents taking new perspectives (Bardeen & Fergus, 2016). Imaginal exposure and problem-solving training both help patients to stick to the problem internally (prevent experiential avoidance) and externally (prevent escape and safety behaviors) in order to master situations, to progress and to experience and reflect on this progress.

Another central intervention for anxiety disorders is behavioral experiments. Patients test new, sometimes even almost paradoxical, behavior, in order to establish new behavior, but more importantly to test existing predictions, cognitions and emotions which are thought to occur after showing a specific (previously avoided) behavior (Hebert & Dugas, 2019; Leahy, 2017). Similar to the already discussed interventions, "behavioral experiments require active identification and reflection on […] personal beliefs and their relationship to objective experiences" (Hebert & Dugas, 2019, p. 424).

This means that demonstrating the new behavior is at least as important as reflecting on it in order to be able to draw new insights for future experiences. Together with the emotional activation, which occurs when actively engaging in such behavioral experiments, insight is facilitated (McKay et al., 2015). The importance of emotional activation for the insight process is discussed in chapter FUNCTION E → I (P. 139) .

#### *3.5.5.2.3. Failure as Information*

As already mentioned, do not only therapeutic progress and solved problems lead to insight, also failures and setbacks allow new realizations as well. Similar to scientific experiments, the rejection of the hypothesis also creates new information (Schiepek et al., 2017). Applied to behavioral experiments, this means that when you reflect carefully after an experiment, you will notice various things that have caused the experiment to fail, i.e. that existing dysfunctional cognitions and beliefs could not be shaken. This often reveals various, previously well-hidden, strategies that have enabled internal avoidance or have been used as safety behavior. This can then be verified again in subsequent behavioral experiments.

#### *3.5.5.2.4. Relation to Motivation & Future Directions*

The insight-generating effect of success is also supported by its interaction with motivation. Success has a motivating effect (see chapter FUNCTION S → M (P. 217)), and motivation in turn facilitates the engagement in the insight process (see chapter FUNCTION M → I (P. 177)). Hence, the insight process activated and supported over several routes.

In summary, there are several indications that support the function S → I. In addition to studies, especially on the role of cognitive competencies in learning (Dymond et al., 2015), the effectiveness and widespread use of behavioral experiments show the usefulness of the function from a practical perspective (Leahy, 2017). Therefore, based on current knowledge, we would recommend keeping the function in the model.

### 3.5.5.3. Function S → M

| Theory | Reference |
|---|---|
| generic model of psychotherapy | (Orlinsky & Howard, 1986) |
| induction of positive expectations | (Grawe, 2000) |
| motivating effect of satisfaction of needs | (Holtforth & Castonguay, 2005) |
| approach motivation and self-determination | (Deci & Ryan, 2008) |
| problem solving: locus of control and self-efficacy | (Heppner et al., 2004) |
| depression as prototypic disorder | |
| **mediating parameters** | |
| motivation as trait m | |
| behavioral resources r | |

***Table 25:*** *Theoretical concepts related to S → M.*

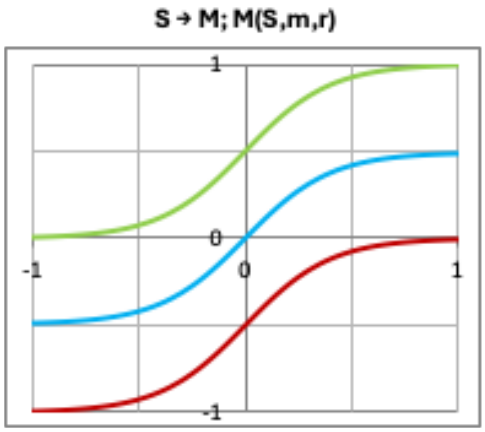



***Figure 21****: Graph of the function S → M (x-axis: input, y-axis: output).*

The experience of success increases motivation. The function S → M represents the motivating effect of success. As therapy progresses and patients gain confidence in their ability to achieve successful outcomes, their motivation to further engage in the therapeutic process tends to rise.

The effect of therapeutic success and reward experiences on motivation follows a logistic growth function with an inert onset (small successful steps initially do not yet trigger big jumps in motivation), followed by an exponential increase, and finally to a damped effect of success on motivation. **Table 25** (p. 217) summarizes of the theoretical concepts related to S → M. **Figure 21** (p. 217) represents the graph of the function.

The parameters m (motivation as trait, self-efficacy expectancies, attribution style) and r (behavioral competencies, trust in the own resources and skills) mediate the effect of success on motivation. Figuratively, r and m influence the magnitude and steepness of the motivation gradient in the growth function (Schiepek et al., 2017). Low levels of self-efficacy expectations and few behavioral resources reduce the influence of success on motivation. This means in this case are even high levels of success experience only elevating

motivation lightly, and failure experience (S-) has a stronger demotivating effect at low behavioral competencies and expectancy effects compared to high levels of r and m.

#### *3.5.5.3.1. Theoretical Perspective: Needs, Consistency Theory & SDT*

The motivating effect of success was already included in the generic model of psychotherapy by Orlinsky & Howard (1986): if enough positive expectations (m) are there, even small changes are perceived as progress (P → S), which in turn elevate the person's motivation. The authors go even further and expand those effects on the patient-therapist relationship. That is, increased patient motivation elevates the therapist's motivation, which in turn strengthens the working alliance.

According to Grawe (2000) the induction of positive expectations is the main driver of the success/motivation interaction (S → M, M → S). In the context of our model, this means that increased levels of trait motivation trigger a self-sustaining positive feedback process. Grawe even compares this to self-fulfilling prophecies (if the belief in success is big enough, motivation follows, and success actually occurs). This means that the higher the expectations of success and also the self-efficacy expectations are (m), the more motivating are moments of success (S → M) and of course vice versa (see chapter Function M → S (p. 181)). Within the scope of psychotherapy Grawe postulates, in the tradition of Jerome Frank, that the induction and transformation of expectations are an important mechanism in the therapeutic process (see also chapter Function of m - Motivation to Change as Trait (p. 246) , with the time delayed trait/state effect) (Frank, 1974; Grawe, 2000).

Another approach explaining the motivating effect of success experience is the consistency theory, also formulated by Grawe (2000) within the scope of his psychological therapy. The theory assumes that humans consistently strive for the satisfaction of their psychological needs. If they are well aligned, a state of congruence is achieved (see also chapter Success and Mental Disorders: Loss of Goal Attainment in Depression (p. 95) and Theoretical Perspective of Therapy Motivation and Therapeutic Progress (p. 182)). As already described in the chapters mentioned, therapeutic progress and the experience of success can be seen as a sign of better satisfaction of needs. This could in turn have a motivating effect, as the direction in which improvement must be worked becomes clearer (similar to insight as a result of success, see also chapter Function S → I (p. 213)). According to (Holtforth & Castonguay, 2005), the satisfaction of needs activates people's inherent approach motivation (behavioral activation system). This connects to the concept of approach and avoidance

motivation, which postulates an approach motivation when there is a clear goal to be achieved. This approach motivation is more motivating and resilient in the long term than avoidance motivation (Brandstätter & Bernecker, 2022; Graham, 2020; C. Harmon-Jones et al., 2011). This, again, can be linked SDT, since fulfilling and living by inherent values and needs in the sense of self-determination promotes motivation (Deci & Ryan, 2008).

#### *3.5.5.3.2. Psychotherapy Research*

In the field of psychotherapy research, De Jong et al. (2021) conducted a big met analysis including almost 22,000 patients, investigating the effect of progress feedback on therapy outcome. Results showed that monitoring the patient's progress and giving him/her feedback increased symptom reduction and reduced drop outs. The actualization of the progress made by discussing the feedback monitoring could be an effective mechanism here. If the patient sees again what she/he has already achieved (reflection of the extent of S) increases and keeps up motivation (M), decreases symptoms (see chapter FUNCTION S → P (P. 221)) and makes patients stick to the therapy for longer, i.e. reducing dropouts. On a theoretical level Brandstätter & Bernecker (2022) describes progress feedback as a process of comparison between the desired goal and the current state, which helps to weigh up whether to continue investing in the goal, hence keeps up the motivation by a cyclic comparison process.

#### *3.5.5.3.3. Problem Solving*

Also, does evidence in the field of problem-solving support the function S → M, especially the role of m. Heppner et al. (2004) reasons, based on a synthesis from the results of over 120 studies, that ineffective problem solvers have a different perception of the locus of control, more irrational beliefs and less social competencies than effective problem solvers. Within the perspective of the function S → M, that means that higher levels of self-efficacy and a functional attribution style of attributing success internally (i.e. the locus of control is perceived as internal; all reflected by higher levels of m), but also higher levels of behavioral skills (r, for example including social competencies) facilitate not only directly the act of problem solving but also the consistency and motivation to do so (Deci & Ryan, 2008; Nezu et al., 2006). I.e. people with high levels of m and r might stick longer to a problem and finally solve it, because they feel more in control, despite setbacks and feel more satisfied by progress. Hence, the motivation is kept up more in phases of progress and is less damped in times of setbacks, due to their attribution style and resources. However,

despite the presented material, most of the research is devoted to the effect of motivation on success (M → S). Hence, the validity of the field of problem-solving research remains limited with regard to the motivational effect of success.

#### *3.5.5.3.4. Example Disorder: Depression*

A prototypic disorder reflecting the function S → M with low levels of r and m is depression. Depression is characterized by few behavioral skills, e.g. reduced drive, withdrawal and avoidance behavior, reduced capability of managing daily activities (Fritzsche et al., 2016; World Health Organization, 2016), as well as low self-efficacy expectations, high expectations of failure, and an external attribution style in regards to success (Clark et al., 2009; Harmon-Jones & Gable, 2018). As already discussed in detail in chapter Parameter m - Motivation to Change as Trait (p. 124) , are the massively reduced self-efficacy expectations a main driver in maintaining depression, also treated in the theories of learned helplessness and decreased trait approach motivation (Abramson et al., 1978; Clark et al., 2009; Harmon-Jones & Gable, 2018; Seligman et al., 1979). Depressed individuals do also reveal deficits in reward processing - a fitting piece in the vicious cycle of reduced efficacy expectations, dysfunctional attribution style and perceptual distortions (see chapter Parameter m - Motivation to Change as Trait (p. 124)).

All in all, the dynamics of depression can be well represented using the functions S → M and M → S, regardless of which entry point is chosen in the depression cycle. If one assumes that, for example, due to life history, there is a low self-efficacy expectation and few behavioral resources. These parameters (⬇️m, ⬇️r) ensure that existing success experiences have a less motivating effect compared to people with higher levels of m and r. As a result of the reduced motivational effect, activities are pursued less frequently, which in turn deprives depressed individuals of the opportunity to have new and corrective experiences (i.e. further successes, M → S). Another entry point would be the lack of success over a longer period, or the experience of several setbacks, which leads to reduced motivation (S → M). This, in turn, reduces the likelihood that people will seek new challenges and thus have new successes (M → S). If this mechanism is in operation over a longer time, the parameters will also change, i.e. the self-efficacy expectation (m) and also the behavioral competencies (r) will decline over a long period of time (see chapter Interaction of States and Traits (p. 32)).

Out of a therapeutic perspective, the treatment of depression does also rely on the mechanism of S → M. The already discussed CBT intervention of behavioral activation (see chapter FUNCTION E → S (P. 150) ) tries to implement new or lost tasks, which can be accomplished, in order to provide a possibility for experiencing positive emotions (E → S), but also success, which helps to grow a motivation for and confidence to engage in further challenges (S → M) (Margraf & Schneider, 2009b; Santos et al., 2019; Wittchen & Hoyer, 2011).

#### *3.5.5.3.5. Conclusion and Recommendation*

In summary, it can be said that there is some supporting evidence for the function S → M. However, further studies would be needed to obtain sufficient quantitative empirical support. Most studies investigate the effect of motivation on success, as presented in Chapter M → S. Nevertheless, additionally to the evidence pointing in the direction of the motivational effect of success, the function S → M is supported out of a practical point of view. Especially CBT uses the motivating effect of success in the central technique of behavioral activation. Based on current empirical and practical evidence, we would suggest to keep the function as a part of the model. However, future validation studies should explicitly investigate the motivating effect of success using a temporal design, in order to deliver further needed clinical evidence.

### 3.5.5.4. Function S → P

| Theory | Reference |
|---|---|
| progress monitoring | (De Jong et al., 2021) |
| broaden and build hypothesis: success as a buffer | (Tugade & Fredrickson, 2004) |
| resilience and coping | (Lazarus, 1991a) |
| **mediating parameters** | |
| behavioral resources r | |

***Table 26**: Theoretical concepts related to S → P.*

Progress and success experiences in therapy help to reduce symptoms and problem intensity. The function S → P represents the symptom reducing effect of success and progress. Positive experiences from session to session are a step in the direction of the desired goal and self-development and help clients to reduce demoralization and emotional problems,

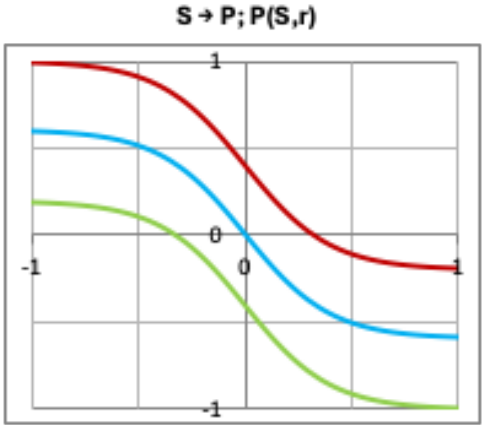



***Figure 22:*** *Graph of the function S → P (x-axis: input, y-axis: output).*

hence reduce self-perceived problem intensity. **Table 26** (p. 221) summarizes the theoretical concepts related to S → P.

The effect of therapeutic success on problem intensity follows an inverse logistic growth function with the steepest gradient of S on P at S = 0. Higher levels of success (S > 0) reduce problem intensity (P ⬇) and lower levels of success and setbacks (S < 0) increase problem intensity (P⬆) (Schiepek et al., 2017). **Figure 22** (p. 222) represents the graph of the function.

The parameter r (behavioral resources and competencies) mediates the effect of success on problem intensity. Higher levels of behavioral competencies allow the application of newly made positive experiences in therapy and a start of a transformation process outside of therapeutic sessions. Better problem-solving skills and behavioral resources that help to install success evoked behavior change in the day-to-day life and will help to reduce problem intensity and symptom severity (Fritzsche et al., 2016; Santos et al., 2019). Similar to the other functions (e.g. S → M) allow higher levels of the mediating parameter, in this case r, that already smaller experiences of success have a problem intensity reducing effect. Whereas low levels of r hinder people from transforming even more intense or frequent success experiences, that means problem intensity does not decrease easily.

#### *3.5.5.4.1. Progress Monitoring as a Way to Increase the Symptom Reducing Effect of Success*

Although empirical evidence is rare regarding the effect of success experience on problem intensity, some research designs can support the function. Progress monitoring and feedback have been shown to reduce symptom severity and to be superior compared to regular non-monitored practice (De Jong et al., 2021; Lambert et al., 2018). Brandstätter & Bernecker (2022) discusses evidence that shows that feedback improves persistence, as it reflects progress towards the desired goal. Combining the results, it can be concluded that reflecting on current progress, e.g. through progress monitoring, not only increases motivation (as discussed in S → M) but also decreases the experience of problems, since recognizing the progress already helps to relief burden. Results by Schaefer & Kavookjian

(2017) regarding motivation interviewing are following the same logic. Motivational interviewing elevates therapy adherence and, as an effect of this symptom severity, decreases. This is not a direct effect of S on P, but consistent therapy adherence might be experienced as progress (evoking cognitions like "I am capable, I can do that"), which in turn leads to a decrease in symptoms.

#### *3.5.5.4.2. Success as a Buffer - The Perspective of the Broaden and Build Hypothesis*

Another perspective on the way of action of S → P can be taken with the broaden and build hypothesis (Tugade & Fredrickson, 2004). Positive emotions and success experience might generate a kind of "buffer" and resilience, hence people can cope better with stressful situations and also symptoms. This is also in line with the concept of coping and resilience by Lazarus (1966; Lazarus, 1991a).

#### *3.5.5.4.3. Conclusions and Recommendations*

Taken together, there is some evidence supporting the problem reducing effect of success experience, especially in the field of process monitoring. However, precise evidence is rare and studies with a research design examining subjective progress experience prior to symptom severity in a therapeutic setting are missing. At the moment, we would still recommend keeping the function in the model, as the symptom reducing effect of success experience seems to make sense from a practical perspective and there is no evidence to the contrary. However, the necessary studies should be conducted to provide sufficient clinical evidence. Depending on the results of these, a decision can then be made whether the function will be kept in further developments of the model.

### 3.5.5.5. Function S → S

| Theory | Reference |
|---|---|
| Lewinsohn's depression model | (Lewinsohn, 1975) |
| Becks' depression model | (Beck, 1979) |
| **mediating parameters** | |
| motivation as trait m | |
| behavioral resources r | |

***Table 27**: Theoretical concepts related to S → S.*

Success facilitates success and failure reduces the feeling of therapeutic progress. The function S → S represents this autocatalytic effect of success and progress experience. Experiencing therapeutic progress towards the directions of self-development - and not only the reduction of symptoms - enhances feelings of success and progress. **Table 27** (p. 224) summarizes theoretical concepts related to S → S.

The autocatalytic effect of success follows a sigmoid growth function with the steepest gradient of S on S at S = 0. Higher levels of success enhance the experience of progress even more. Whereas setbacks reduce feelings of progress or even facilitate feelings of failure (Schiepek et al., 2017). **Figure 23** (p. 224) represents the graph of the function.

The effect is mediated by the parameters m (trait motivation, self-efficacy beliefs, reward expectations) and r (resources, behavioral skills). Higher levels of r and m facilitate the autocatalytic effect of success experience even further. While lower levels of r and m reduce the effect. As already discussed in detail, e.g. in chapter FUNCTION P → S (P. 202), does the mediating effect of m work via self-efficacy beliefs and the related attribution of success and failure. If motivation as trait is high, success is more easily experienced and interpreted as progress, success experience is attributed internally, which fortifies the belief in future success and competence. This finally carries over to future behavior as the general trust in the own development and competence influences the taken actions and shown behavior (Chartrand et al., 2010; Graham, 2020). Behavioral resources (r) help to

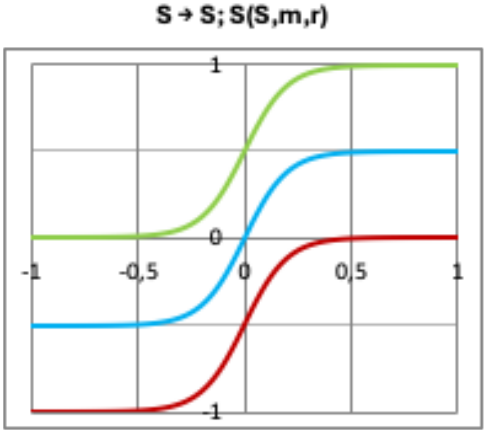



***Figure 23**: Graph of the function S → S (x-axis: input, y-axis: output).*

keep going with the transformational actions and behavior, which helped to produce success experience. Having the behavioral competencies to implement the experience of progress and success in daily actions facilitates autocatalytic effect of progress experience.

#### *3.5.5.5.1. Depression as a Prototypic Disorder for the Autocatalytic Effect of Success*

There are various theories explaining depression by the lack of reinforcement. The most known theory here is Lewisohn's depression model (Lewinsohn, 1975). The function S → S fits the mechanism described in the theory: due to diverse reasons success experiences (i.e. reinforcing events) are missing, hence further feelings of progress and development stagnate. This, in turn, leads to (even more) withdrawal and losing possible reinforcing situations and activities, and triggers many other downward processes (e.g. S → E, Margraf & Schneider, 2018b). The depressive cycle continues. Depression models by Beck (Beck, 1979) and modern cognitive-behavioral therapy (CBT) are similar (Margraf & Schneider, 2018b). A difference in the newer models, including Beck's model, is that in addition to withdrawal behavior, cognitions and negative assumptions about the future are also included. Moorey (2010) integrates six different viscous cycles of depression, which are believed to maintain depression. Most of them are reflected in the parameters m and r of the model. So can withdrawal, unhelpful and avoidance behavior be counted to r, as a lack of behavioral resources and competencies prevent better behavioral options from being available and used. Negative beliefs about oneself, the world and the future (referring to Beck's cognitive triad) are summarized under the points of automatic negative thinking and self-attacking and are reflected by low self-efficacy beliefs in our model (parameter m).

#### *3.5.5.5.2. Possible mediator c & coverage of S → S within the existing functions*

However, at this point it is already hard to differentiate between the parameters m and c. Automatic negative thinking and self-attacking could be maintained by low self-efficacy beliefs (m), but perhaps it might be a dysfunctional cognitive process, reflected by parameter c (for a detailed discussion about dysfunctional cognitive processes like rumination see chapter Mediating Role of c (p. 203) in P → S). Some even argue, that negative prospection as a cognitive process is the main driver of depression (Roepke & Seligman, 2016), which brings up whether the parameter c should be included as a mediator in the function S → S. Evidence here is not clear. This means that, at best, different versions of the model are tested against each other, one containing c as a mediating parameter and the other not.

In addition to the overlap of the evidence for parameters c and m, it is noticeable that the evidence between the functions S → M, M → S, as well as S → E and E → S is sometimes difficult to differentiate from the evidence regarding S → S. Current research designs do not allow to distinguish sufficiently whether an increase in motivation or positive emotions enhances success experience, i.e. working as mediator, or if success directly enhances itself. A main example here is the effect of progress feedback on outcome (De Jong et al., 2021). Progress feedback can enhance motivation, it can induce positive emotions, or directly elevate experienced progress. All possibilities are plausible and can be supported with theoretical and some empirical evidence, but a clear decision is not possible. We would recommend testing different models against each other to analyze the contribution of the autocatalytic effect of success.

#### *3.5.5.5.3. Conclusions and Recommendation*

Due to close relation to CBT theories, the function should be kept in the model based on current knowledge. However, it should be considered testing a model including the function S → S against a model only implementing the indirect relation of the autocatalytic effect of success (via E → S, S → E and M → S, S → M). The possible effect of c as a further mediator should also be considered empirically. Based on the results, the decision should be made whether the function/mediator improves the predictions and, therefore, should be kept in the model.

## 3.6. Equation of Variables: Integrated Coupled Nonlinear Equations

The model comprises five variables ('states', E, I, M, P, S) and four parameters ('traits', a, c, m, r), which are connected by 25 possible functions, which were introduced in the previous chapters. 16 of those functions are currently included in the model. The different functions are represented in mathematical terms and are integrated into five coupled nonlinear difference equations. Every equation represents how a specific variable changes or evolves in relation to other related variables, the variable's own current state, and the various parameters included in the formula. For a mathematical description and discussion, see Schiepek et al. (2017) and Schöller et al. (2019). **Figure 24** (p. 228) depicts the four variables and their mediating effect on each of the 16 functions of the variables, included in the model. The second part of the diagram shows the coupled linear equations for each variable with the corresponding mathematical equation and its dependencies on variables and parameters. Lastly, the functions with the corresponding mathematical equations and dependencies of the four parameters are shown. The equations can also be found in the **Appendix A: Equations of the Variables** (p. 324) and **Appendix B: Functions of the Parameter** (p. 325) .

| | | **related variables and parameters** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Equations** | **E** | **P** | **M** | **I** | **S** | **a** | **m** | **c** | **r** |
| **E** | E(E,I,P,S,c,r,m) | x | x | | x | x | | x | x | x |
| **P** | P(E,S,c,r) | x | | | | x | | | x | x |
| **M** | M(P,S,r,m) | | x | | | x | | x | | x |
| **I** | I(E,M,S,a,c) | x | | x | | x | x | x | x | x |
| **S** | S(E,I,M,P,S, a,c,m,r) | x | x | x | x | x | x | x | x | x |

***Table 28:*** *Overview of the equations with the related parameters and variables for each variable.*

The following sections describe the equations from a content-theoretical perspective shortly, similar to the discussion of the functions presented. **Table 28** (p. 227) summarizes all equations and the related parameters and variables.

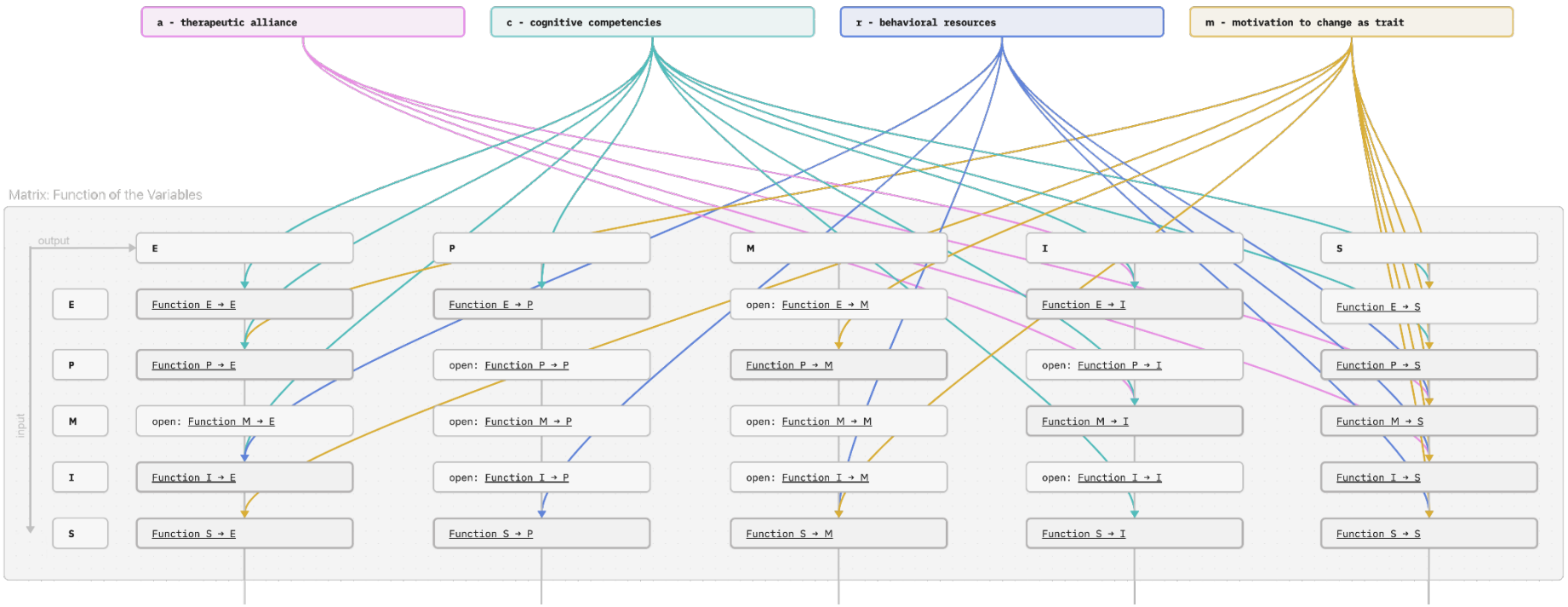
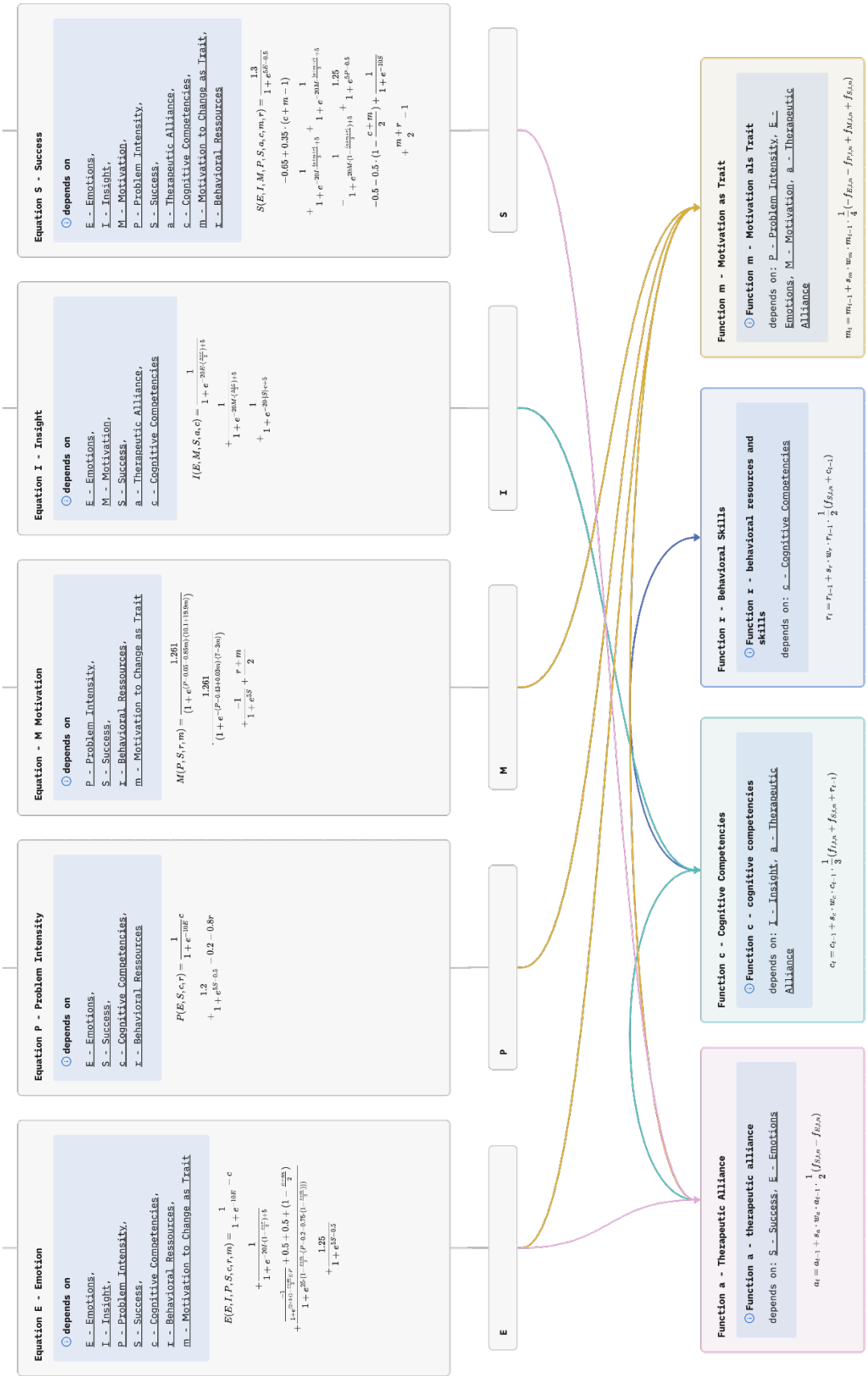



***Figure 24**: The diagram depicts the four parameters (a, c, r, m) and their mediating effect on each function. The 25 functions are listed in the central matrix, showing the input on the left side and the output on the top (columns). The second part of the diagram (continued on the next page) depicts the integrated coupled equations of each variable with the mediating variables and parameters, as well as the corresponding mathematical equation. The last part represents the functions of each parameter and its dependencies and the corresponding equation*


Equation E - Emotion
depends on
E - Emotions,
I - Insight,
P - Problem Intensity,
S - Success,
c - Cognitive Competencies,
r - Behavioral Ressources,
m - Motivation to Change as Trait
Equation P - Problem Intensity
depends on
E - Emotions,
S - Success,
c - Cognitive Competencies,
r - Behavioral Ressources
Equation - M Motivation
depends on
P - Problem Intensity,
S - Success,
r - Behavioral Ressources,
m - Motivation to Change as Trait
Equation I - Insight
depends on
E - Emotions,
M - Motivation,
S - Success,
a - Therapeutic Alliance,
c - Cognitive Competencies
Equation S - Success
depends on
E - Emotions,
I - Insight,
M - Motivation,
P - Problem Intensity,
S - Success,
a - Therapeutic Alliance,
c - Cognitive Competencies,
m - Motivation to Change as Trait,
r - Behavioral Ressources
E
P
M
I
S
Function a - Therapeutic Alliance
Function a - therapeutic alliance
depends on: S - Success, E - Emotions
Function c - Cognitive Competencies
Function c - cognitive competencies
depends on: I - Insight, a - Therapeutic Alliance
Function r - Behavioral Skills
Function r - behavioral resources and skills
depends on: c - Cognitive Competencies
Function m - Motivation as Trait
Function m - Motivation als Trait
depends on: P - Problem Intensity, E - Emotions, M - Motivation, a - Therapeutic Alliance

### *3.6.1. Equation: E - Emotion*

E (E, I, P, S, c, r, m)

The equation E integrates the different functions explaining the role of emotions within the therapeutic change process. E interacts with emotions itself (E), insight (I), problem intensity (P) and success (S), and is influenced by the parameters cognitive competencies (c), behavioral resources (r) and motivation as trait (m). If you look at what influences emotions, then on the one hand, it is emotions themselves. The autocatalytic effect of E on itself represents the emotion regulation processes. Hence, positive and negative emotions can intensify themselves, depending on cognitive competencies (Gross, 2015). Insight (I) can intensify emotions, especially negative ones, in the short term, which is part of the 'look-into-the-abyss' perspective, which is common in psychotherapy. The concept assumes that a certain confrontation with negative, symptom inducing material and emotions is necessary in order to acquire relief in form of a changed inner organization (Grawe, 2000; Hill et al., 2007). Problem intensity (P) generally triggers distressing emotions, with an exponential increase as problems become more severe. At very high levels of problem intensity, the regular emotional response is disrupted by repressing or disconnecting from a conscious experience via drug usage, self-harm, or dissociation (Bohus et al., 2021; Nijenhuis & Van Der Hart, 2011; Sharp & Fonagy, 2015). Experiences of success and therapeutic progress (S) tend to reduce negative emotions and enhance positive emotions (Lyubomirsky et al., 2005).

In addition to the variables, several parameters also play crucial roles in mediating these relationships. Cognitive competencies (c) have a widespread influence: in the E → E relationship, higher c allows better down-regulation of negative emotions and sustaining positive ones; in I → E, c enables better management of emotions triggered by insights along with behavioral skills (r); in P → E, cognitive competencies reduce the impact of problems on emotional distress ("containing"); and in S → E, c helps to maintain positive emotions even in the face of setbacks (Aldao et al., 2016; Cierpka et al., 2014; Gross, 2015; Gunderson et al., 2018; Sharp & Fonagy, 2015). Motivation as trait/self-efficacy (m) influences the P → E relationship, where higher m leads to better coping with problems, reducing their emotional impact. In the S → E relationship, higher m enhances the positive emotional impact of successes and buffers against negative emotions from failures (Veilleux et al., 2021).

In summary, emotions are influenced by a complex interplay of variables and parameters in this model. At the moment, there is no effect of motivation (M) on emotions, as there is not enough evidence supporting this relation. The cognitive competencies (c) parameter appears to have the most widespread mediating effect across different relationships. The model suggests emotions are central to the therapeutic process, but their effects and regulation depend highly on individual client characteristics as cognitive skills, trait motivation, and behavioral skills.

### *3.6.2. Equation: I - Insight*

I (E, M, S, c, a)

The equation I integrates the different functions, explaining the role of insight within the therapeutic process. I interacts with emotions (E), motivation (M) and success (S), and is influenced by the parameters cognitive competencies (c) and the therapeutic alliance (a).

Emotions (E) play an important role in the insight process. As already discussed, are we following the "look into the abyss" paradigm, which assumes that engaging with negative emotions is necessary for gaining meaningful insights (Greenberg, 2015; Yalom, 2010). In this case, this means that a certain level of emotional arousal considered optimal for gaining insight, while very low or very high emotional intensities may hinder the process, as it is not enough confrontation with the straining material or too much, so that a person gets into an emotional distress area in which he or she can no longer learn an appropriate handling (Grawe, 2004b; Orlinsky et al., 2004).

Motivation (M) also facilitates the insight process. Increasing levels of motivation lead to increasing levels of insight, as motivation is necessary for engaging in and persevering through the often challenging process of gaining insight (Linn-Walton & Maschi, 2015; Norcross & Wampold, 2011). Success experiences and therapeutic progress (S) generate insight and information. Progress can be an information source on how problems can be solved. Reflecting on aspects which made therapeutic progress possible gives insight to possible helpful strategies and facilitators. In the same way, insight can be drawn from setbacks and failures. Hence, both successes and failures can lead to insights, with mid-levels of success or failure potentially providing the most insight (Kuncewicz et al., 2014; Leahy, 2017). At the moment, there is no self-enhancing effect of insight included in the model (I → I), as there is no evidence supporting this effect. Also, the effect of problem

intensity on insight is not included (P → I). Although there is some theoretical evidence supporting this effect, empirical evidence is missing. Furthermore, the model does already include an indirect effect of problem intensity on insight via E (P → E, E → P). In regard to an economical model development, this should be sufficient at the current time.

Two parameters significantly influence the relationships between E, M, S and I. Cognitive competencies (c) is a central mediator: in E → I, higher c enables better utilization of emotional experiences for gaining insight and allows people to transform even higher levels of emotional distress into insight; in M → I, higher c helps to sustain motivation and facilitate the insight process; and in S → I, higher c allows for more insight to be gained from both successes and failures (Bateman & Fonagy, 2013; Orlinsky et al., 2004). The therapeutic alliance (a) supports the insight process in multiple ways: in E → I, a strong alliance provides a safe environment for engaging with painful emotions necessary for insight; and in M → I, the alliance helps to maintain and direct the client's motivation towards insight-generating processes (Silberschatz, 2013; Sugiura & Sugiura, 2015).

To summarize, the model conceptualizes insight as emerging from a sophisticated interaction between emotional states, motivational levels, and therapeutic progress experiences, whether positive or negative. This intricate network of influences underscores the multifaceted nature of the insight-generating process in psychotherapy. These relationships are further moderated by the client's cognitive competencies and the quality of the therapeutic alliance. The model emphasizes that insight is not a purely cognitive process, but one that requires emotional engagement, motivation, and supportive conditions to occur effectively in psychotherapy.

### *3.6.3. Equation: M - Motivation*

M (P, S, m, r)

The equation M integrates the different functions explaining the role of motivation within the therapeutic process. M interacts with problem intensity (P) and success experience (S), and is influenced by the parameters motivation as trait (m) and behavioral resources (r).

Problem intensity (P) drives motivation up to a certain point, as the symptom burden encourages the desire to make a change (Grawe, 2000; Schulte, 2015). Initially, as problem intensity increases, motivation to change also increases, almost exponentially. However,

there is a turning point where very high levels of problem severity can lead to feelings of helplessness and a decrease in motivation (Mulder et al., 2014). Success and therapeutic progress (S) have a positive effect on motivation. Small initial steps in success may not greatly impact motivation, but as success accumulates, there is an exponential increase in motivation, followed by a dampening effect for very high levels of success. Experienced progress in therapy helps patients to gain confidence in their ability to achieve desired outcomes and enhances their motivation to further engage in the change process.

The parameters m (motivation as trait, self-efficacy expectations) and r (behavioral competencies). Motivation as trait (m) allows individuals to handle more severe problems before feeling overwhelmed and losing motivation, essentially determining the "turning point" in the inverted U-shaped function (P → M). Higher expectations in one's self-efficacy and belief in the own success allows people to transform even more straining challenges into motivation (Bandura & Locke, 2003; Maddux & Kleiman, 2016). Furthermore, enhances m the motivational effect of success and buffers against the demotivating effect of failures (S → M), by promoting a more functional attribution of success experiences and a connection to self-efficacy levels (Clark et al., 2009). Behavioral competencies and trust in one's own resources and skills (r), along with m, enhances the motivational impact of success experiences, as individuals with more behavioral resources and skills are more likely to transform experienced progress to motivational actions (Santos et al., 2019).

At the current time point, emotions (E), insight (I) and motivation (M) itself are not included as directly driving forces of M. In the case of E → M, the evidence is ambiguous regarding the clear nature of the interaction. There is some evidence supporting a motivation enhancing effect of insight. This relation might be an amendment to the model worth to consider. For M → M, there was no evidence found supporting a self-enhancing effect of motivation.

Taken together, motivation in this model is influenced primarily by the intensity of problems or symptoms and by experiences of success or therapeutic progress. These relationships are further mediated by individual traits, such as self-efficacy expectations and behavioral competencies. The model suggests that motivation is a dynamic variable that responds to both challenges (problems) and achievements (successes), but the nature of these responses can vary significantly based on individual characteristics.

### *3.6.4. Equation: P - Problem Intensity*

P (E, S, c, r)

The equation P integrates the different functions, explaining the role of problem intensity within the therapeutic process. P interacts with emotions (E) and success experience (S), and is influenced by the parameters cognitive competencies (c) and behavioral resources (r).

Emotions (E) have a significant impact on problem intensity. Negative emotions ($E > 0$) tend to increase problem intensity, while positive emotions ($E < 0$) tend to decrease it (Cuijpers, 2020; Hennemann et al., 2023). Therapeutic progress and success experiences (S) have a reducing effect on problem intensity. Higher levels of success help to attenuate problem intensity, while lower levels of success or setbacks increase it. Reflecting on success via progress monitoring and feedback helps to reflect on the already made progress and helps to relief symptom burden (Brandstätter & Bernecker, 2022; De Jong et al., 2021).

Two parameters mediate the effects on P. Cognitive competencies (c) mediate the E → P relationship. Higher levels of c reduce the impact of negative emotions on problem intensity and may even allow slight negative emotions to have a reducing effect on problem intensity, as c contains the key process of emotion regulation (Gross, 2015). Better emotion regulation allows to differentiate better between temporary emotions, maybe evoked in non-disorder-related situations, and symptoms. Hence, higher levels of c attenuate a direct impact of emotions on problem intensity (Kirwan et al., 2017; Maher-Edwards et al., 2011; Radkovsky et al., 2014). Behavioral resources and competencies (r) moderate the S → P relationship. Higher levels of r allow for better application of therapeutic progress to everyday life, enhancing the problem-reducing effect of success experiences (Fritzsche et al., 2016).

In the current version of the model, there is no direct effect of insight (I), motivation (M) and problem intensity (P) itself on P included. For insight (I), while it may elevate problem intensity in the short-term, these are likely to be captured through other pathways in the model (e.g., I → E → P). The relationship between motivation (M) and problem intensity (P) is not directly modeled, as any effects are likely mediated through other variables as success (S). Finally, while a self-enhancing effect of problem intensity (P → P) could theoretically exist, the model currently captures such effects indirectly through other pathways as well (e.g., P → E → P). The indirect pathways promote a more parsimonious model

construction and imply a reasonable time delay in the self-enhancing effects of problem intensity.

In summary, problem intensity in this model is mainly influenced by emotions (E) and success experience (S). These relations are mediated by cognitive competencies (c, E → P) and behavioral resources (r, S → P). Effects of other variables are not directly included at the moment, but indirect pathways still account for the complex interplay of different factors affecting a patient's experience of problem intensity during the therapeutic process.

### *3.6.5. Equation: S - Success*

S (E, I, M, P, S, c, m, r, a)

The equation S integrates the different functions explaining the role of success experience within the therapeutic process. S interactions with all variables (E, I, M, P, S) and are influenced by all parameters (c, m, r, a).

Emotions (E) play a significant role, with positive emotions contributing to the sense of progress and enhancing feelings of success, as a sign of a better satisfaction of needs (Grawe, 2004b). While negative emotions tend to discourage and reduce those feelings. Insight (I) achievements have a progress-enhancing effect, as they are necessary for developing new problem-solving abilities and perspectives that lead to behavior change (Barkham et al., 2021; Jennissen et al., 2018). Motivation (M) can be seen as a precursor of therapeutic success, with higher levels of motivation supporting and being necessary for therapeutic progress (Holtforth & Castonguay, 2005; Orlinsky et al., 2004; Prochaska & Velicer, 1997). Problem intensity (P) influences success in that higher levels of problem intensity or symptom severity reduce the perceived success and progress of therapy, and a reduction in symptom severity facilitates feelings of progress (Barkham et al., 2021). Success (S) itself has an autocatalytic effect, meaning that success facilitates further success, while failure reduces the feeling of therapeutic progress (Margraf & Schneider, 2018b).

All parameters impact those relationships. Cognitive competencies (c) mediate several relationships: in E → S, higher c allows better management of negative emotions without losing the sense of progress (Gross, 2015); in P → S, it makes individuals more resilient against symptom exacerbations or setbacks, by avoiding an overidentification with the symptoms (Bernstein et al., 2015; Hayes et al., 2014). Behavioral resources and skills (r)

influence I → S by allowing for better application of insights internally and externally to facilitate progress, M → S by enhancing the ability to translate motivation into concrete actions and progress (Heppner et al., 2004; Nezu et al., 2012), and S → S by helping to maintain progress-promoting behaviors (Margraf & Schneider, 2018b). Motivation as trait and self-efficacy expectations (m) mediate E → S by strengthening the confidence in a good (self-)development and progress despite negative emotions (Wampold et al., 2018), I → S by enhancing the tendency to implement insights (increased approach motivation) (Scheffer & Heckhausen, 2018), M → S by amplifying the effect of state motivation on progress (Beutler et al., 2011; Grawe, 2004b), P → S by fostering a perspective which keeps up motivation and hurdles surmountable despite high problem intensity (Frank, 1974), and S → S by enhancing the autocatalytic effect of success via functional attribution styles (Graham, 2020). The therapeutic alliance (a), while not explicitly included in all functions, is mentioned as potentially important in I → S by providing support for implementing insights, and in M → S by helping maintain and direct motivation towards progress (Wampold & Flückiger, 2023).

Taken together, success is influenced by a complex interplay of emotions, insights, motivation, problem intensity, and previous experiences of success. These relationships are further mediated by individual traits such as cognitive competencies, behavioral resources, self-efficacy expectations, and the quality of the therapeutic alliance. The model suggests that success in therapy is a dynamic process, influenced by multiple factors and feedback loops.

## 3.7. Functions of Parameters

The interaction of states and traits in personality dynamics has already been introduced in chapter Interaction of States and Traits (p. 32). Rooting in synergetic principles the concept of circular causality between states and traits creates a comprehensive framework for understanding personality development (Schöller et al., 2018). The framework assumes traits can predispose individuals to experience certain states more frequently or at different intensities, while recurring states can reinforce or modify traits over time. This leads to several implications for the therapeutic process. Symptoms are the results of the current internal landscape. In order to gain symptom relief and treat disorders, changes in the parameter of the systems have to be made to enable permanently changed behavior and experience. That means a long-lasting health and well-being-oriented personality development with a change of the traits, not only the states, has to be targeted and initiated in psychotherapy (Schiepek et al., 2017; Schöller et al., 2018).

The model incorporates equations for traits based on the introduced functions of the variables. These equations demonstrate how changes in a parameter depend on various factors, including the dynamics of state variables. This mathematical representation allows a more precise understanding of the complex interplay between states and traits, providing a quantitative framework for studying personality dynamics in psychotherapy. Consequently, the equations that govern the dynamics of the parameters a, c, m, and r are influenced by the dynamics of the variables E, I, M, P and S (Schöller et al., 2018). The following chapters integrate the findings discussed in the chapters of the functions to deliver a parameter-oriented summary. **Table 29** (p. 237) provides an overview of all equations and the related parameters and variables.

| | | **related variables and parameters** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Parameters** | **E** | **P** | **M** | **I** | **S** | **a** | **m** | **c** | **r** |
| **a** | a(S,E) | x | | | | x | | | | |
| **m** | m(P,E,M,S) | x | x | x | | x | | | | |
| **c** | c(I,S,r) | | | | x | x | | | | x |
| **r** | r(S,c) | | | | | x | | | x | |

***Table 29**: Overview of the functions with the related parameters and variables for each parameter.*

### *3.7.1. Function of a - Therapeutic Alliance*

a (S, E)

Alliance is the most important factor which facilitates therapeutic outcome (Wampold & Flückiger, 2023). This brings up the question of how alliance can be improved. When integrating the different functions of the variables in which a plays a role, it becomes clear that especially the variables S (success) and E (emotions) have an influence on the development of a. This means that the therapeutic relationship improves with increased experiences of success and progress, as well as with positive emotions (a⬆️ ~ S⬆️ + E⬇️). Established concepts of alliance as well as research support this interaction.

#### 3.7.1.1. Effect of S

Bordin (1979), who delivered one of the first analysis of alliance, suggested three aspects of alliance which are important in therapy: agreement on goals, tasks and mutual trust and understanding. Dynamics regarding goals and tasks are covered with the variable S, as it reflects the patients' experienced progress during therapy. If the patient and therapist pursue the same goals and tasks, the collaboration is much closer (i.e. the relationship improves), and the probability that the goals will be achieved is higher (i.e. increases of success are experienced). This is because support (therapeutic work) and self-motivation (the patient's work) move in the same direction, with high overlap between goals and tasks.

However, research mostly focuses on symptom decrease as an effect of alliance. In this case, evidence shows that alliance can be both a precursor and a result of symptom decrease (Wampold & Flückiger, 2023). Hence, regarding the role of increased success experience as a precursor of alliance, research is missing and further studies are needed, investigating the time related relation between alliance and progress, in order to support the current model. Additionally, it has to be considered, including P as an influential factor on alliance as well (Wampold & Flückiger, 2023). Albeit missing empirical evidence supporting the role of progress on alliance, our model is in line with existing theoretical frameworks. Besides Bordin's factors of goals and tasks, which integrate into S, Wampold & Flückiger (2023) suggest a framework with three pathways influences alliance and outcome, based on reviewing current evidence regarding alliance. These three "CARE Pathways" include the pathway of relationship and **bond** (CARE: support, empathy, caring, understanding, reassurance, trust, warmth and genuineness) and the pathway of **expectancy** with goals and

tasks (therapist competencies influencing this are verbal fluency). In the latter, the two aspects suggested by Bordin are combined (goals and tasks), as we suggested prior. The third pathway encompasses specific effects, inducing the impression of a residual category (including repairing alliance ruptures, re-establishing goals and tasks, meta-communication). We agree with Wampold & Flückiger (2023) regarding the pathways care and expectancy, hence the effect of the therapeutic bond and work on goals and tasks as important facetted of the therapeutic alliance. Regarding the specific pathways, we would argue that the aspects, relevant for psychotherapy do also fall in the bond aspect, if it is modeled dynamically, which is the case in our model (especially rupture repair sequences), or are represented via the other variables (regarding specific interventions, e.g. emotion focused interventions via E and I). In summary, this means that the model by Wampold & Flückiger (2023) can also be reduced to the components goals/tasks and relationship (bond), which are reflected by the parameters S and E in our model. Other research shows that interpersonal complimentary, as well as interactive coordination and congruence as important factors of alliance (Constantino et al., 2021; Crits-Christoph & Conolly, 2021; Orlinsky et al., 2004; Rogers, 1957). We would also suggest that the effects of successful interaction can be depicted with the variable S, as a close collaboration of therapist and patient fosters, autonomy, success experience and goal achievement. High levels of therapist's responsiveness allow adequate and sensitive reinforcement of progress, which promotes the experience of success and is related to therapeutic alliance. Also, alliance-enhancing effect of rupture repair sequences can be explained with the variable S. Repairing the relationship not only reduces negative emotions, but above all also leads to a sense of success. The relationship has been restored, which in itself is a sign of success, but is a new experience, especially in the case of many disorders, which are characterized by relationship breakdowns (e.g. borderline personality disorder) (Bohus et al., 2021).

#### 3.7.1.2. Effect of E

The other variable effecting a is E. An increase in positive Emotions (E⬇️) fosters improvements in alliance. Connecting to the already introduced theoretical frameworks, this refers to the aspect of mutual trust and understanding by Bordin (1979) and the bond pathway by Wampold & Flückiger (2023). High levels of therapists' empathy, warmth, acceptance and understanding foster patients' experience of positive emotions and thereby strengthen the alliance. Constantino et al. (2021) summarize evidence, which shows that higher emotional

congruence between therapist and patient facilitates outcomes. Enhancing positive emotions might be a factor in establishing a good dyadic congruence and relationship. This is also conceptualized as the first step of the concept complementary relationship by Grawe (2000):

> *According to Grawe's concept of complementary relationship (Grawe, 1992; Grawe et al., 1996), the therapist ought to act in a way that allows the patient to have experiences consistent with important but unfulfilled motivational schemata. This conveys to the patient positive control experiences, and it signals him that he is being understood and accepted in his innermost concerns, instead of being evaluated negatively. This experience creates the basis for the patient's trust and confidence, assuring him that the therapeutic relationship will offer support for his innermost needs. Therefore, a good therapeutic relationship enables the patient to have a multitude of positive experiences with regard to two activated basic needs: the need for control and the need for a consistent relationship that offers protection and support. (Grawe, 2004b, p. 436)*

Once a good therapeutic relationship is established, enduring painful moments and emotions together can deepen the relationship further. For example, provokes the insight process negative emotions in the short term, which can only be sustained with a good enough therapeutic alliance (Gelso & Harbin, 2007). At the same time, the therapeutic relation intensifies by going through that deep pain together.

Taken together, repeated experiencing of positive emotions in the therapeutic context and a long-term decrease in negative emotions on the patient side might foster the therapeutic alliance. This is supported by therapist characteristics like warmth, empathy, and acceptance.

#### 3.7.1.3. Similarities of the Model to Attachment Theories

Besides empirical evidence and models of alliance in the field of psychotherapy research, a look into the world of attachment theories supports the construction of our model. As already discussed in detail, there is a close connection between a person's attachment history, the development of mental illness and the benefits and use of the psychotherapeutic relationship (see chapter Attachment Theory & Types (p. 101)). When working with the assumption that the therapeutic alliance provides new attachment experiences, in a way the patient has not experienced them and needs corrective experiences in order to progress, it is relevant to examine what constitutes a good relationship in the context of childhood development (Mallinckrodt, 2010). In order to develop a secure attachment style, children need a reliable and secure base with an emotional warmth and reacts sensitive and responsive to the child's needs (Bowlby, 1988; Lengning & Lüpschen, 2019). Within the

framework of our model, those aspects could be mapped to the variable S and E again. If the caregiver repeatedly and sensitively perceives the needs and experiences of success and validates them (S), the child is encouraged in the development of his or her own (positive) emotions (E), as well as, of course, in the behavior shown that causes success. Transferred to the therapeutic relationship, the aspects of emotional warmth, responsiveness, caring and providing a reliable support are also found as important factors supporting alliance (Wampold & Flückiger, 2023). Taken together, the relationship-promoting aspects of S and E are also supported from the perspective of attachment theories.

#### 3.7.1.4. Conclusion and Recommendation

Therapeutic alliance is a crucial factor in facilitating positive outcomes in psychotherapy. Two main variables, Success (S) and Emotions (E), significantly influence the development of alliance (a). The therapeutic relationship improves with increased experiences of success and progress, as well as with positive emotions. Existing theoretical frameworks support the distinction of success (task, goal orientation) and emotional experience as influential factors in alliance development, like the conceptualization of alliance by Bordin (1979) and the CARE-Pathways by Wampold & Flückiger (2023).

The variable S (success) reflects the patient's experienced progress during therapy, covering the dynamics of goal and task development. When patient and therapist align on these aspects, it increases the likelihood of achieving goals and strengthens their collaboration. Repeated experiences of positive emotions in the therapeutic context, along with a decrease in negative emotions, foster a stronger therapeutic alliance. Therapist characteristics such as empathy, warmth, and acceptance foster positive emotions in patients.

However, although there are connections to existing frameworks supporting our model, there is - as often - time-related evidence missing. Hence, more research is necessary in order to investigate whether S and E change prior to a, and if S and P can be differentiated sufficiently with their effect on a. In addition, it is difficult to draw precise conclusions as most of the research regarding the therapeutic alliance is focused on therapist characteristics and therapist behavior (Barkham et al., 2021; Wampold & Flückiger, 2023). We, on the other hand, have a patient focused model of change processes, which makes the translation of results more difficult and also more vulnerable, as we always tried to transfer one step 'further'. For example, high levels of therapist empathy facilitate positive outcomes. In this

case, we built the bridge over enhanced positive emotions by the therapist's empathy. In the case of the therapist's responsiveness, we transferred the effect on alliance over patient's enhanced progress experience through the therapist's responsiveness.

Although there is empirical (time-series based) evidence missing, supporting the role of S and E of the patients in the development of a, it is plausible to keep the relation as it is. Firstly, no contrary evidence could be found. Thus, the model is open for further validation. Secondly, the current construction of the model shows a close connection between existing psychotherapeutic and attachment theories. At this point in time, we recommend leaving the role of a with the supporting parameter. Further developments of the model should be provided with more evidence regarding the time-related effects of S and E.

### *3.7.2. Function of c - Cognitive Competencies*

c (I, S, r)

Cognitive competencies include capacities of emotion regulation, mentalization and self-reflection, as well as the level of personality structure (according to the OPD). If you aim for long-term change as part of the therapeutic change process, this always involves a change in the control parameters. This raises the question of how cognitive competencies change as part of the therapeutic process in order to establish a different internal structural level in the long term. When integrating the different functions of the variables in which c plays a role, it becomes clear that especially the variables I (insight), S (success experience) and the parameter r (behavioral competencies) have an influence on the development of c. This means that cognitive competencies improve by involving in the insight process again and again, by perceiving repeated success and progress experiences, as well as by bringing social and behavioral resources into action (Schöller et al., 2018).

Research in the field of emotion regulation offers the most starting points regarding the effects of factors I, S and r on c. The training of emotion regulation and cognitive competencies consistently works through enhancing reflective capacity and strengthening control processes (Cohen & Ochsner, 2018). This enhancement occurs through various mechanisms. One approach involves receiving feedback through technical devices, which can be considered a form of "passive" feedback. This includes neuro- and progress feedback systems, which fall under the success (S) factor, as the provided feedback works like a scaffolding for developing reflective capacities (Lambert et al., 2018; Linhartová et al., 2019).

Another method involves obtaining feedback while engaging in new situations, representing "active" feedback. This relates to both resources (r) and success (S) factors, as it involves engaging in social contexts and solving challenging situations. Putting oneself in different contexts delivers a broad range of personal experiences, which can contribute to a better understanding of the environment and oneself (Schiepek et al., 2017). Additionally, the insight (I) factor plays a role when clients engage with challenging material during the therapeutic process, learning to cope with and reflect on difficult content with the therapist's guidance and feedback (Hill et al., 2007).

Sadka & Antle (2022) outline different emotion regulation trainings that can be associated with the factors influencing c.

For example, is mindfulness-based stress reduction often closely related to behavioral competencies (r), as it involves various behavioral and action-oriented interventions like breathing exercises that help target cognitive processes, particularly distancing from inner processes (Goldin & Gross, 2010). In addition, mindfulness techniques use body-related interventions to install another reference point to promote reflective capacities. However, our model does currently not include a body-related variable, which is discussed in chapter Possible Variables based on Factor Analysis (p. 255) . Social-emotional learning programs in schools also have a strong connection to behavioral competencies, focusing on integrating cognitive, affective, and behavioral skills in everyday contexts (Weissberg et al., 2015). Cognitive-behavioral therapy (CBT) primarily focuses on physiological signs as precursors of emotions, which would relate to behavioral competencies and potentially to a body-oriented variable (currently missing from the model) (Aldao et al., 2014). Psychotherapy further closely aligns with the insight process (I), particularly experiential strategies that focus on fully experiencing emotional states (e.g. Greenberg & Pascual-Leone, 2006). Frederickson et al. (2018) describes how experiential strategies work via experiencing the emotional state under the therapist's guidance. The authors further discuss how this approach helps develop the cognitive and emotional capacity for self-regulation. This process closely aligns with the process of insight, as described in chapter Variable I - Insight (p. 88) . This is further supported by a meta-analysis by Jennissen et al. (2018), showing that insight enhances self-understanding and reflective capacities. Sloan et al. (2017) further demonstrate the impact of psychotherapy on cognitive competencies, noting reduced emotional dysregulation after treatment, possibly due to experiencing challenging emotions under the therapist's guidance as well. Recent research has also focused on the effect of interactive

technologies, such as mobile apps, wearable technologies, and bio- and neurofeedback systems, in supporting emotion regulation training. This falls under the aspect of progress and success experience (S). Several studies examining the effect of progress feedback via apps support these findings, highlighting the potential of technology in enhancing cognitive competencies and emotion regulation skills through feedback and progress experiences (Lambert et al., 2018; Michaelis et al., 2022; Wadley et al., 2020).

As therapy progresses and individuals gain insights, experience success, and develop their resources, their capacity for emotion regulation, mentalization, and self-reflection (c) is likely to improve. This interconnected nature of variables in Schiepek's model demonstrates how progress in one area can support development in cognitive competencies, creating a dynamic and evolving process of therapeutic change.

### *3.7.3. Function of r - Behavioral Resources*

r (S, c)

The parameter r behavioral resources includes problem-solving and social skills. A long-term change started by the psychotherapeutic process also aims to change the control parameter r, in order to make sustainable changes and establish a sustainable development outside of therapy. When integrating the different functions of the variables in which r plays a role, it becomes clear that especially the variable success experiences (S) and the parameter cognitive competencies (c) influence the development of r. This means - in the opposite direction of the evolution of c - that the development of r depends on emotion regulation and cognitive competencies, as well as on perceiving success and progress in problem solving and the therapeutic process (S) (Schöller et al., 2018).

#### 3.7.3.1. The Role of Cognitive Competencies

Cognitive competencies (c) play a significant role in the development of behavioral skills. As individuals enhance their capacity for emotion regulation, mentalization, and self-reflection, they become better equipped to develop and refine their behavioral repertoire. Difficult tasks, problem-solving and challenging situations can be sustained longer, with better emotion regulation, hence more situations can be experienced and used to build up behavioral skills. Further, the ability to regulate emotions effectively allows for more adaptive responses in social situations, while improved mentalization and self-reflection

facilitate a better understanding of one's own and others' behaviors. This increased awareness and control creates a foundation for acquiring and honing new behavioral skills (D'Zurilla & Goldfried, 1971; Heppner et al., 2004; Nezu, 2004).

Disorders with a deficit in cognitive competencies, especially in emotion regulation, often also show a deficit in behavioral resources and competencies. Heppner et al. (2004) and Kashdan & Rottenberg (2010) frame this deficit under the term of reduced flexibility (similar to the concept of psychological flexibility in the Acceptance and Commitment Therapy (Hayes et al., 2006)). A lack of emotion regulation and cognitive competencies prevents a person to react adaptive to a situation, to act despite great fear (e.g. anxiety disorders) or even if there is great exhaustion (e.g. in the case of depression). A recent review by Watkins & Roberts (2020) shows, that high levels of rumination (as a sign of low cognitive competence) are associated with reduced executive functions and problem-solving skills. Executive functioning deficits can contribute to rumination by allowing negative material to dominate working memory and impairing the ability to override habitual ruminative tendencies. Substantial research has demonstrated a link between executive functioning impairments and high levels of depressive rumination, with evidence of deficits in inhibitory control, working memory updating, and task-switching. Experimental studies using cognitive control training suggest that manipulating executive functioning can influence rumination (Watkins & Roberts, 2020). In addition to the aspect of executive functions and emotion regulation as part of c, there is also evidence that early development of empathy, as an aspect of mentalization and part of c, predicts the development of later social skills (as part of r) (Allemand et al., 2015). In summary, this means that different aspects of c influence the development of r.

#### 3.7.3.2. Role of Success Experience

Success in problem-solving and therapeutic progress (S) also contributes substantially to the development of behavioral skills. As individuals experience success in overcoming challenges and achieving therapeutic goals, they gain confidence in their abilities and are more likely to engage in new behaviors. These successful experiences serve as positive reinforcement, encouraging the continued application and refinement of behavioral skills (Grawe, 2000). In cognitive-behavioral therapy, this mechanism is widely used in interventions focusing on behavioral activation, in order to establish success experiences and build up behavioral competencies (Margraf & Schneider, 2018a).

Additionally, success and cognitive are interacting and create a synergistic effect on the development of behavioral skills. For instance, improved emotion regulation (part of c) may lead to more successful social interactions (S), which in turn provides opportunities for practicing and enhance social skills (r). Similarly, better problem-solving abilities resulting from therapeutic success may encourage individuals to approach new challenges, further expanding their behavioral repertoire.

#### 3.7.3.3. Missing Role of m

Besides S and c, there is evidence suggesting a close connection between problem solving, behavioral competencies and motivation as trait and self-efficacy expectations (Grawe, 2000; Heppner et al., 2004; Wasserman & Wasserman, 2020). Grawe (2000) describes a circular effect between r and m, in a way that expectations influence the actual behavioral repertoire, and that an increased behavioral repertoire supports higher levels of self-efficacy expectations. Putting into a phrase, this could be, 'What I think I can do determines the actions I take'. And the actions I take determine what I think I can do'. Partly this relation is already covered with success experiences, supporting the development of behavioral competencies, as discussed above. However, further studies should investigate if trait motivation and expectations have a separate impact on the development of behavioral resources.

In conclusion, the development of behavioral skills (r) in Schiepek's model is a dynamic process influenced primarily by cognitive competencies (c) and therapeutic success (S). This development is not isolated but interacts with and influences other aspects of the model, contributing to a comprehensive and integrated approach to therapeutic change.

### *3.7.4. Function of m - Motivation to Change as Trait*

| m (P, E, M, S) |
|---|

The parameter m motivation as trait includes self-efficacy expectations and the confidence in the own development. A long-term change started by the psychotherapeutic process also aims to change the control parameter m, in order to empower patients to keep the development changes also outside of therapy by their own motivation and trust in themselves. When integrating the different functions of the variables in which m plays a role, it becomes clear that the variables problem intensity (P), emotions (E), state motivation (M) and

success experiences (S) influence the development of m. This means that increases in the trait motivation depend on reduced problem intensity, increases in positive emotions and state motivation, as well as in repeated success experiences (Schöller et al., 2018).

#### 3.7.4.1. The Role of Problem Intensity

Successful problem reduction over an extended period contributes to the development of trait motivation. As clients experience a consistent decrease in their symptoms and challenges, they develop greater confidence in their ability to change and overcome difficulties. For instance, cognitive-behavioral therapy (CBT) has shown moderate positive effects on reducing negative symptoms like apathy and enhancing motivation in schizophrenia (Correll & Schooler, 2020). Additionally, research on CBT for generalized anxiety disorder found that as self-efficacy and outcome expectations increased, the severity of symptoms decreased (Vîslă et al., 2022). Moreover, a meta-analysis of schizophrenia research emphasized the importance of understanding which negative symptom measures best assess reduced motivation, highlighting the significance symptom severity in the development of motivation (Luther et al., 2019). This long-term reduction in problems reinforces the belief that positive change is possible, thereby enhancing trait motivation. Although there is some evidence supporting the effect of prolonged reduced problem intensity on the development of motivation, evidence investigating long-term changes in trait motivation is missing. Further is more research available investigating the other direction: the symptom reducing effect of enhanced trait motivation and self-efficacy, which is also included in our model and discussed in chapter Function S → P (p. 221) .(e.g. Kardash, 2024).

#### 3.7.4.2. The Role of Emotions

Increases in the experience of positive emotions foster trait motivation. Positive emotional experiences can create a more optimistic outlook and strengthen the belief in one's ability to achieve positive outcomes. In a detailed review by Lyubomirsky et al. (2005), the authors conclude that even small positive affects from day to day promote general positive self-attributions like optimism, self-mastery, and self-confidence, even though most studies are on a correlational basis. However, other studies have shown that positive affect influences motivation directly and indirectly through affective states like enthusiasm, leading to increased engagement and self-efficacy beliefs (Salanova et al. 2006, 2011). Further, positive affect has been found to enhance expectancy motivation by affecting cognitive processes

involved in motivation (Erez & Isen, 2002). These findings collectively suggest that increased positive affect plays a crucial role in fostering motivation and self-efficacy expectations.

#### 3.7.4.3. The Role of State Motivation

Prolonged increases in state motivation also improve trait motivation and self-efficacy expectations. Bandura (1977) highlights that experiences of mastery in activities that are perceived as challenging but safe can lead to enhanced self-efficacy. This suggests that state motivation, derived from mastering tasks, can positively influence trait motivation and self-efficacy beliefs. However, this effect is closely related to success and progress experiences, as discussed in the next chapter and also included in the model in the function S → M.

Shi et al. (2010) conducted a randomized controlled trial focusing on improving self-efficacy in Chinese patients with Type 2 diabetes mellitus. The study demonstrated that enhancing self-efficacy expectations was more predictive of behavior change than knowledge and skills. The self-efficacy fostering interventions used a role model and targeted barriers using group-based discussions. Seeing a person successfully monitoring their glucose level and getting supported in mastering barriers could enhance state motivation, which in turns effects self-efficacy expectations on a later timescale. However, there are no precise explanations in this or other studies of how the self-efficacy enhancing interventions effect self-efficacy development .(see also Merluzzi et al., 2019).

Another perspective could be taken by using the self-determination theory (SDT), which emphasizes the importance of fostering autonomous motivation and self-development in the process of psychotherapy (Ryan & Deci, 2008). As clients' intrinsic motivation is supported over sustained periods through the therapeutic context, a gradual shift in their overall dispositional motivation can occur, as they are learning what their intrinsic goals are and how to generate and mobilize long-lasting autonomous motivation.

Taken together, there are some evidence and theories supporting the effect of state motivation on the development of trait motivation and self-efficacy expectations, but precise studies are missing. Future studies aiming to support the model should investigate the effect of state motivation on trait motivation further.

#### 3.7.4.4. Role of Success Experiences

Experiences of therapeutic progress and success contribute significantly to increasing confidence in one's own development and self-efficacy expectations. In his social cognitive theory of self-regulation, Bandura (1991) suggests that individuals can enhance their self-efficacy through mastery experiences, social modeling, social persuasion, and physiological states. By engaging in activities that provide opportunities for success, observing others succeed, receiving encouragement, and managing stress effectively, individuals can boost their self-efficacy beliefs.

Cognitive-behavioral makes use of this mechanism in interventions like behavioral experiments that aims to establish small, achievable goals that lead to experiences of success, which not only boost state motivation (M) and success experiences (S) but also contribute to the development of trait motivation over time (Margraf & Schneider, 2018a, see also chapter FUNCTION S → M (P. 217)). Although different theoretical approaches and interventions established in practice support the effect of success experiences on the development of trait motivation and self-efficacy expectations, specific evidence is missing. Future studies aiming to support the model should investigate the effect of success experiences on long-term trait motivation development further.

In conclusion, the development of trait motivation (m) is a complex process influenced by the interplay of problem reduction (P), positive emotional experiences (E), sustained state motivation (M), and therapeutic success (S). These factors work together to shape a client's long-term motivational disposition, enhancing their belief in their ability to change and maintain improvements achieved through therapy.

# 4. Discussion

The introduced model for psychotherapeutic change by Schiepek et al. (2017) demonstrates how diverse research findings can be synthesized into a unified framework for understanding psychological change. It incorporates insights from current problems in psychotherapy research, common factors research, existing integrative concepts, as well as key psychological domains such as motivation, emotional regulation, cognitive processing, and attachment theory. Five state-like dimensions of change (variables: emotions, insight, motivation, success, problem intensity) and four trait-like dimensions (parameters: alliance, cognitive competencies, behavioral competencies, motivation as trait) were synthesized their relation to each other discussed covering 25 functions. Additionally, equations for each variable and parameter were introduced as integration of the functions involved. Many of the relations cover well established mechanisms of psychotherapy. However, some of them are lacking evidence, mostly due to the lack of time-series dependent and long-term studies, investigating how therapeutic changes are sustained and whether they impact the level of personality structure and development.

Overall, the model offers a complex and far-reaching comprehensive conceptualization of how the therapeutic process works, trying to deliver a coherent theory of therapeutic change by integrating different psychological theories, psychotherapeutic approaches and mechanisms. It underscores the dynamic nature of psychotherapy, acknowledging that understanding the mechanisms of change is crucial for developing effective treatments. This approach emphasizes the importance of explaining the process of change in psychotherapy, rather than focusing solely on outcomes.

With so many hypotheses and assumptions established within this model, it naturally offers an equally large surface for falsification. Central limitations and shortcomings are discussed. However, the model should not be considered as a final product, but as a starting point for guiding future psychotherapy process research and practice.

## 4.1.Mathematical Problems: Constants

Although the mathematical construction of the model is not part of this thesis, theoretical considerations about the problems arising from the specific mathematical constraints are discussed shortly.

In this model, we have formulated psychological concepts in a manner analogous to physical laws, although it's important to acknowledge that psychological phenomena inherently possess less precision than physical principles. The relationships described in the model are grounded in current research, but they represent idealized versions of our theoretical understanding. This means, several mathematical constraints especially in the form of constants were added in the equations, in order to produce bifurcation diagrams (procedure of "windowing") (Schiepek et al., 2017). I.e. the range of the parameters is restricted, in order to enable a reasonable simulation. Although this is a common problem with formal theories (Bringmann et al., 2023; Robinaugh et al., 2019), and such a "fine tuning of parameters and natural constants" (Schiepek et al., 2017, p. 15; see also anthropic principle by Barrow et al., 1987) is an established process, the chosen constants remain open to verification.

In physics and biology, several constants are well known, like the standard acceleration of gravity, freezing points of substances, or the body temperature of living beings. In the field of psychology, the search for mathematical laws and constants goes back to the psychometrics, psychophysics and gestalt psychologists (Boring, 1961). There have been attempts to find parallels between psychological phenomena and physical laws (Philpott, 1950), but the difficulty of mathematizing and operationalizing psychological measures physically remained (Spence, 1944). Spence (1944) argues that "as yet we do not have very many such laws, except in the case of the simplest kinds of behavior (sensory responses, reflexes, etc.)." (Spence, 1944, p. 52).

Now, 80 years later, several constants can be identified - however, they remain on the "simplest kind of behavior". For example, the reaction time for simple tasks averages around 200-250 milliseconds (Jain et al., 2015; Luce, 1986; Welford, 1980). Sensation measures include absolute thresholds, which represent the minimum detectable stimulus intensity (such as 0 dB for hearing a 1000 Hz tone), and difference thresholds (Just Noticeable Differences, also known as the Weber's Law), which indicate the smallest detectable change in stimulus intensity (often approximately 2% for weight perception) (Fechner, 1966; Gescheider, 1997). Memory span is often assessed through digit span tests, where people can typically recall between four (Cowan, 2001; Cowan, 2010) and seven (plus or minus 2) digits in order (Miller, 1956). Short-term memory duration is generally 15-30 seconds without rehearsal (Baddeley, 2000; Oberauer, 2002). In terms of physiological measures, nerve conduction velocity in large, myelinated fibers typically ranges from 50 to 60 meters per second (Kimura, 2013; Waxman, 1980). This means that one gets the impression that there

are certain constants in the field of psychology - but they all relate to (neuro)biological measures. The extent to which these measures are related to the constants in a psychotherapy process model remains open.

As the field progresses, we expect that future empirical studies will provide more detailed and specific definitions of these psychological hypotheses and constants. It is crucial to note that the functions in this model were not arbitrarily chosen or deliberately constructed to generate chaotic patterns. Instead, they were derived from a top-down approach, drawing upon the most pertinent findings in psychological and psychotherapy research. This contrasts with a bottom-up method that might have focused on creating functions to fit specific dynamics or optimal patterns.

## 4.2. Theoretical Problems

### *4.2.1. Problem of Variable Selection*

In this thesis, we introduced numerous models describing the process of therapeutic change. While these models often encompass similar dimensions, there are also notable differences. The process of clustering variables inherently attempts to categorize the dynamic reality of psychotherapy into discrete constructs. This inevitably leads to overlaps between categories, as the complexities of human experience and change do not always fit neatly into distinct boxes.

For instance, the mechanisms and needs proposed by Grawe (2000) overlap with several variables and parameters in our model. Similarly, Lambert's process learning dimension shares commonalities with our variables of insight and cognitive competencies. These overlaps highlight the interconnected nature of psychological processes and the challenges in creating mutually exclusive categories.

Interestingly, while some dimensions are represented across multiple models, others are not consistently included as separate aspects. A notable example is the dimension of success, which is often underrepresented in existing models (Cuijpers, 2020). Traditionally, success in psychotherapy has been primarily equated with symptom reduction. However, investigating non-symptom related positive developments induced by psychotherapy is not yet a common practice (Cuijpers, 2020) (Fernández et al., 2023) (Rashid, 2015). This focus on

symptom reduction as the primary measure of success means that subjectively perceived success experiences, which can be crucial to the therapeutic process, often get lost in nomothetic measures (Lloyd et al., 2019).

Bringmann et al. (2023) summarizes the shortcomings of theory-driven top-down models while simultaneously underlining their importance: “the parameter values and functions are not based on empirical data, but on their theoretical plausibility and ability to produce the relevant behavior” (p.28). Bringmann further notes:

> *More generally, Burger and colleagues (2020) propose to use these kinds of theory-driven models based on differential equations to model mental disorders, and also argue that they can be useful to inform case conceptualization in clinical practice. Overall, there seem to be relevant links between networks and complex dynamic systems models, and ways in which they can be fruitfully combined to model and understand psychopathology. (Bringmann et al., 2023, p. 29)*

This perspective highlights both the limitations and potential of theory-driven models in advancing our understanding of psychopathology and therapeutic change.

Taken together, our top-down approach to assessing psychotherapy is likely missing some variables, as it is never possible to fully depict reality in a model. However, we have attempted to extract the most general dimensions of change while following a minimalistic approach to model construction. We acknowledge that future studies and empirical verifications will further reveal missing or potentially dispensable constructs and relations.

A first hint at a potential missing element has already emerged, as a body-related variable is currently absent from our model. This highlights the ongoing nature of model development and refinement in the field of psychotherapy research.

### *4.2.2. Problem of choosing Relations: Direction of Effect*

In addition to the challenges of variable selection, another significant issue in modeling psychotherapy processes is determining the direction of the effect. This relates to assumptions about how psychotherapy works. Two primary concepts can be distinguished in this regard: the ‘look-into-the-abyss’ concept and the ‘heureka’ concept (Schiepek et al., 2017).

The “look-into-the-abyss” concept posits that, during the therapeutic process, the patient must confront and engage with painful material (metaphorically looking into the abyss) in order to achieve symptom relief. This perspective has been implemented in our model, particularly in the function E → I. Emotion-focused therapies heavily rely on this principle

(Greenberg, 2019). Similarly, Grawe incorporates this concept in several aspects of his psychological therapy approach (Grawe, 2000). The roots of this idea can be traced back to Freud's notion of catharsis in psychoanalysis (Pritz & Stumm, 2008).

Conversely, the "heureka" perspective suggests that negative emotions are not required to gain insight and make psychotherapeutic progress. According to this view, insight needs not be inevitably linked to negative emotions, but can be directly associated with positive emotions. For instance, resource-oriented work and creative approaches like idiographic system modeling can evoke positive emotions and facilitate insight without involving negative emotional experiences (Schiepek et al., 2015). Solution-focused brief therapy, which emphasizes positive circumstances and aspects, aligns more closely with this heureka perspective (De Shazer & Dolan, 2008).

The choice between these perspectives has significant implications for how we conceptualize and model the therapeutic process. While our model currently leans towards the "look-into-the-abyss" approach, it's crucial to acknowledge that this represents a specific theoretical stance rather than an absolute truth. It's important to note that psychotherapy likely incorporates both perspectives at various points throughout the therapeutic process. Future research and model iterations may need to consider how to incorporate aspects of both perspectives to provide a more comprehensive representation of the diverse pathways through which therapeutic change can occur.

### *4.2.3. Missing Relations: Inclusion of Relations*

As previously discussed in the individual chapters detailing the functions, the current model incorporates only 16 of the 25 possible relations between variables. This selection is primarily driven by a top-down approach, based on theoretical considerations and complemented by empirical findings.

All 25 possible relations are discussed in this thesis. Each chapter dedicated to a specific relation provides a comprehensive discussion of current evidence and theoretical considerations. These discussions synthesize the available information to formulate a recommendation on whether to include the relation in future iterations of the model. This approach ensures that each potential relationship is carefully evaluated for its theoretical relevance and empirical support before being incorporated into the model structure.

However, it is important to note that this theoretical perspective, while valuable, should be complemented with rigorous empirical examination. As recommended in various sections of this work, future research should focus on testing the contribution that each relation would provide to the model's simulation and predictive capabilities. This empirical validation process is crucial for several reasons: first, it can confirm or challenge the theoretical assumptions underlying the inclusion or exclusion of specific relations. Second, it may reveal unexpected relationships that were not initially considered based on theoretical grounds alone. Third, it can help to quantify the relative importance of different relationships within the model, potentially leading to a more parsimonious and accurate representation of the psychotherapeutic process.

By combining theoretical reasoning with empirical testing, we can refine the model to more accurately reflect the complex dynamics of psychotherapeutic change. This dual approach acknowledges the value of existing theory while remaining open to new insights that may emerge from data-driven analyzes.

In conclusion, while the current selection of 16 relations is grounded in theoretical considerations, it represents a starting point rather than a final structure. The ongoing process of model development should involve a continuous interplay between theory and empirical testing, allowing for including additional relations or the removal of existing ones based on their demonstrated contribution to the model's explanatory and predictive power.

### *4.2.4. Possible Variables based on Factor Analysis*

A recent factor analysis of the therapy process questionnaire has revealed a new dimension related to body- and self-awareness, which is currently not represented in the existing model (Schiepek et al., 2019). This omission of physical experiences and awareness capabilities likely constitutes the most significant limitation of the current model. Many therapeutic approaches, including mindfulness practices, heavily rely on the competencies of body and physical awareness. In numerous therapies, the ability to notice and experience bodily signals is a central aspect of the therapeutic process. Beyond body-oriented therapies, emotion-focused therapies and skill-oriented interventions like dialectical behavioral therapy regularly emphasize how situations, emotions, and current arousal feel on a physical level. This focus aims to enhance self-awareness, gain insight, and improve self-control (Greenberg, 2019; Höschel, 2023; Röhricht, 2009).

Interoception, as a measure of physical awareness, has been shown to be impaired in many disorders, such as depression, obesity, anxiety, and eating disorders. It is also affected by stress (Badoud & Tsakiris, 2017; Dunn et al., 2010; Eggart et al., 2019; Farb et al., 2015; Khalsa et al., 2018; Martin et al., 2019; Schulz, 2015; Zamariola et al., 2017). Given this evidence, expanding the model to include a dimension of physicality and physical awareness is crucial.

From a theoretical perspective, it would be beneficial to incorporate both a variable and a parameter for this dimension. Many existing concepts, like mindfulness, represent trait-like competencies that influence daily experiences. Numerous studies have already connected interoception with other trait-like measures. For instance, interoception has been linked to theory of mind (included in our parameter c) (Shah et al., 2017), and interactions between self-identification and interoception (Filippetti & Tsakiris, 2017), as well as expectation (Critchley & Garfinkel, 2017) (reflected in our parameter m), have been observed. Research has also indicated a shared memory of body and mind, suggesting a "common mechanism subserving knowledge of our cognitive and bodily states" (Chua & Bliss-Moreau, 2016, p. 146). Furthermore, studies have explored the interaction between mindfulness and insight and its relation to self-awareness (Nakajima et al., 2019), and network models have shown a relationship between interoception and anxiety disorders (Slotta et al., 2021).

It is worth noting that there is some overlap between mindfulness and cognitive competencies, as discussed by Choi-Kain & Gunderson (2008) and in the chapter on cognitive competencies (Parameter c - Cognitive Competencies (p. 108)). We have previously suggested that it might be conducive to distinguish between the more physical-related factor of mindfulness and the more cognitive-related factor of mentalization.

Research has shown that interoception has both state and trait-like aspects (Poerio et al., 2024; Wittkamp et al., 2018), which aligns with the prior argument that body-awareness is not only a state but a trait-like capability that can be developed. Additionally, interoception has been found to be closely related to emotional and motivational experiences on both short-term and long-term levels, further supporting its state and trait components (Critchley & Garfinkel, 2017; Poerio et al., 2024). As Critchley et al. conclude, "increasingly evidence describing how interoceptive signals influence emotional and motivational processes make it untenable to dismiss the contribution of bodily physiology to emotions as epiphenomenal" (Critchley & Garfinkel, 2017, p. 12).

Given these considerations, we propose implementing both a parameter and a variable for body- and self-relatedness. The variable B should encompass state awareness, mindfulness, interoception, and self-awareness, while the parameter b should include trait mindfulness and interoception.

Existing research provides insights into how these new components might relate to the model's current variables and parameters. We have already introduced findings on the relationship between emotionality E and state and trait interoception (B, b) (Critchley & Garfinkel, 2017; Poerio et al., 2024). Better interoceptive capacity (B, b) could facilitate timely perception of emotions, aiding in the development of in-time emotion regulation (c). Nakajima et al. (2019) discusses the effect of elevated levels of self-perception on insight processes (I). There is also evidence supporting the positive impact of better self-awareness (b/B) on increased cognitive competencies (c) (Choi & Medalia, 2010; Shah et al., 2017).

Interoception has been shown to be closely related to stress, suggesting that a stronger therapeutic alliance should work as a stress reducer and a mirror of the patient's state, thus facilitating interoceptive moments (B) and the development of general interoceptive capability (b) (Schulz, 2015). Accordingly, an increase in problem intensity (P) would likely reduce state interoceptive awareness (B), as symptom intensity elevates stress levels and hence reduces internal focus. Last, higher levels of trait interoception (b) could facilitate the perception of success, as even smaller changes might be detected with increased awareness.

Critchley & Garfinkel (2017) provides a list of various measurements that can be used to assess trait and state interoception, which could be valuable for future research and model validation.

While these theoretical considerations and empirical findings on interoception provide a strong rationale for including body and self-awareness in the model, empirical validation is needed to test whether the variable and parameter of body- and self-relatedness contribute to the analytical and prediction qualities of the model. Such validation efforts would be crucial in confirming the value of these proposed additions to the existing framework.

## 4.3. Practical Problems

### *4.3.1. Using Outcome-Research Evidence for Building a Process-Based Model*

In the introduction of this thesis, we have already outlined the problematic aspects of the pre-post analytic paradigm prevalent in current psychotherapy research (as discussed in Chapter Introduction) (Eronen & Bringmann, 2021; Hayes, Hofmann, & Ciarrochi, 2020). These limitations of pre-post analysis not only affect our current conceptualization of therapeutic processes, but also interfere with the construction of process-based models.

Although our model aims to overcome the limitations of pre-post analysis, its construction inevitably relies on the limited outcome research findings currently available. Many arguments presented here, attempting to support the assumed procedural relations between variables, depend on such outcome-oriented findings. For instance, when discussing the effect of motivation on success experiences throughout treatment, it is challenging to find truly procedural data.

In fact, there is a scarcity of studies investigating the specific procedural relations between the different variables included in our model. Consequently, to connect the model to existing data, we have had to rely on classical pre-post results in many cases. Using the previous example, this means that correlations between higher pre-treatment motivation and lower post-treatment symptoms were used to support the hypothesized success-enhancing effect of motivation *during* treatment.

We acknowledge that this approach is not ideal and deviates from gold standard practices. Where possible, we relied on process-based findings. However, despite our model focusing on the most common variables used to assess the psychotherapeutic process rather than highly specific ones, procedural data remains scarce.

It is worth noting that while the field of common factors research is not new, process-based research is a relatively recent development. The combination of both - process-based common factors - has not yet generated a substantial research base. This lack of directly relevant research makes it challenging, or even impossible in some cases, to provide robust empirical support for all aspects of our model.

Despite these limitations, we believe our model represents an important step in the right direction. It provides a trans-diagnostic, school-independent framework for assessing psychotherapeutic change and processes. This framework is closely connected to the needs of psychotherapeutic practice while simultaneously aligning with research standards.

Validation studies of parts of the model have already taken place (Schiepek et al., 2019), and further studies are currently ongoing. These studies will hopefully provide higher quality findings to support or refine the proposed relations within the model.

In conclusion, while the reliance on pre-post outcome data for supporting a process-based model is not ideal, it represents a necessary compromise given the current state of the field. As more process-based research becomes available, we expect the model can be refined and improved, leading to a more accurate representation of the dynamic processes underlying psychotherapeutic change.

### *4.3.2. Problem of the Paradigm: Mathematical Language Does not Suit Psychologists*

While the synergetic paradigm offers many advantages for assessing, analyzing, and predicting psychotherapeutic processes, it is important to acknowledge its main drawback: its mathematical language.

As Ludewig (2012) argues, some of the mathematical terms inherent to the synergetic approach, such as “phase transition,” “order parameter,” and “dynamic instability,” do not align well with common psychotherapeutic jargon. This misalignment can create a barrier to understanding and acceptance among practitioners who are more accustomed to traditional psychological terminology.

Although statistics are deeply embedded in psychological research, many clinical psychotherapists are often apprehensive or unwilling to engage with empirical data and research. This reluctance contributes to what is known as the implementation gap between research and practice (Goldfried, 2019; Ionita et al., 2020). This gap represents a significant challenge in translating research findings into clinical application.

Our model aims to bridge this gap by making data assessment, analysis, and clinical implications more straightforward and accessible. However, we recognize that the mathematical terms borrowed from the synergetic paradigm might still present a barrier for some

practitioners. This potential obstacle underscores the need for careful communication and translation of concepts between the research and clinical domains.

In developing this work, we have made a concerted effort not only to connect established paradigms of psychotherapeutic schools to our model, but also to embed classical psychological terms within the synergetic paradigm. This approach represents an attempt to provide a two-way translation between these different conceptual frameworks, making the model more accessible to practitioners while maintaining its scientific rigor.

Looking forward, it is clear that further effort should be made to bring the synergetic and psychotherapeutic jargon closer together. This could involve highlighting parallels between concepts, finding or developing mutually understandable terms, and training both therapists and researchers to develop a common linguistic base. Such efforts would not only enhance the accessibility of synergetic models like ours, but also contribute to narrowing the implementation gap in psychotherapy research.

In conclusion, while the mathematical language of the synergetic paradigm presents a challenge, it also offers an opportunity to develop a more integrated language to discuss psychotherapeutic processes. By addressing this challenge head-on, we can work towards a more unified understanding of psychotherapy that bridges theoretical, empirical, and practical perspectives.

### *4.3.3. The Relation of a Generalized Framework and an Idiographic Approach*

Haslbeck & Ryan (2022) and Burger et al. (2020) emphasize the importance of idiographic modeling in psychotherapy research, advocating for the development of individual disease models for each patient. While our model, with its suggestion of a common framework and variables, appears to move away from this idiographic approach, we argue it remains compatible with individualized assessment when allowing room for uncertainty and flexibility.

Our model can be integrated with idiographic approaches by combining the standardized Therapy Process Questionnaire with personalized questionnaires based on the idiographic system modeling approach (Schiepek, 2022). This method allows practitioners to create individualized questionnaires for each patient. Therapists can then allocate the individually

generated items to the dimensions of our model, creating a bridge between idiographic assessment and more generalized frameworks.

This approach offers a degree of generalizability to idiographic questionnaires while maintaining their personalized nature. However, it is important to note that there is no validated clustering method for this allocation process. The assignment of individual items to model dimensions by therapists is not controlled for validity, which introduces a level of uncertainty. Nevertheless, this approach represents an attempt to bring individual measures and nomothetic approaches closer together, addressing a significant challenge in psychotherapy research.

Personalized questionnaires have demonstrated superiority in various aspects compared to standardized questionnaires, particularly in terms of patient acceptance (Olthof et al., 2022). While it's true that using individually created questionnaires limits comparability between people, this limitation may be less problematic than it initially appears.

First, the primary focus of our model is on capturing change rather than on specific content. Change can be best assessed through maximally fitting questionnaires, which personalized measures provide. When change is the central focus, the generalizability of content becomes less crucial. Second, personalized items may actually capture content more effectively than standardized measures, as they avoid typical problems associated with standardized questionnaires, such as misunderstandings or lack of relevance to individual experiences. As Olthoff aptly summarizes: "A complex systems approach aims to generalize in terms of dynamics, not content, and is therefore a promising theoretical framework for studying personalized questionnaires" (Olthof et al., 2022, p. 3).

This perspective aligns well with our model's focus on capturing dynamic processes in psychotherapy.

In conclusion, while our model provides a standardized framework, it represents a step towards integrating personalized questionnaires and idiographic research into a broader theoretical structure. By allowing for incorporating individualized measures within its framework, our model attempts to bridge the gap between nomothetic and idiographic approaches in psychotherapy research.

It is worth noting that the parallel assessment using the standardized Therapy Process Questionnaire remains possible and provides a validated method of assessment alongside more

personalized measures. This dual approach allows for both standardized comparison and individualized assessment, potentially offering a more comprehensive understanding of therapeutic processes and outcomes.

# 5. Perspectives

In this thesis, we have provided the theoretical framework for the psychotherapy process model proposed by Schiepek et al. (2017). The dimensions of change, variables, parameters, and their relationships were embedded and connected to established concepts in psychotherapy research and practice, as well as linked to empirical evidence. While the model presents a consistent framework, it should also serve as a starting point for further research and is constructed to be open to new integrations.

Future intervention studies could utilize the framework of this model to investigate which interventions target specific dimensions. For instance, existing evidence suggests that affect-focused interventions lead to higher emotional experiences in clients (Fisher et al., 2020). Similarly, attachment-focused interventions in patients with low-secure attachment have been shown to enhance therapeutic outcomes (Lambert et al., 2018; Levy et al., 2018). This dual approach allows for tailoring interventions based on the assessment of patients' constitutions (e.g., using emotion-focused interventions when the parameter E shows critical instability) and testing whether interventions have an effect on the dimensions they claim to target, such as whether motivational interventions impact M. Ideally, a tested set of interventions could be recommended for targeting specific parameters in psychotherapy.

The model can be expanded to incorporate the therapist's system as well. Research has shown that the therapist's attachment style influences the therapeutic alliance (Degnan et al., 2016), and in-session synchronicity between patient and therapist has been observed (Tschacher & Meier, 2020). Measuring the course of both therapist and patient throughout therapy might enhance outcomes, especially for interactionally difficult patients with personality disorders.

Furthermore, the process-based nature of the model and the related digitalized framework, Synergetic Process Management (SNS) (Schiepek, 2022), provide an optimal basis for including various psychobiological measurements that are becoming increasingly common. For example, sleep measures are more easily accessible with devices such as the Oura Ring (https://ouraring.com/) (Svensson et al., 2024). Heart rate and pedometer data are implemented in many wearable devices, like the Oura Ring and Apple Watch (https://www.apple.com/de/watch/) (see Sadka & Antle, 2022 for an extensive overview). These process-based measures could contribute to analyzing and evaluating the psychotherapeutic process and examining the implementation and effect of interventions. For example, sleep hygiene

interventions and activity structure could be easily examined to determine whether the patient implemented them and if there is an effect on motivational and emotional variables afterward.

Last, this model attempts to bridge the gap between individualization and generalization – the core conflict in psychology and psychotherapy research since its inception. Until now, general knowledge has been generated through the standardization of interventions and averaging results from many subjects. However, this approach makes it almost impossible to extrapolate findings to individuals, or only possible under almost untenable assumptions (Molenaar, 2004). By shifting the paradigm to a non-linear process model with a focus on change dynamics, content individualization becomes possible while simultaneously allowing for the generalization of change dynamics and mechanisms. This is achieved by providing universal dimensions for comparison, which offer the possibility of including standardized variable/parameter measurements while maintaining openness for individualization.

## 5.1. Conclusion

*Never forget that the map is not the territory! All models are wrong, but some are useful. – Ido Portal*

In conclusion, while the presented model based on Schiepek et al. (2017) still contains many unanswered questions and areas for improvement, it offers a valuable framework for overcoming several challenges in the current field of psychotherapy research and practice. Despite limitations, such as the model not being minimal enough, containing unexplained constants, and lacking sufficient process-based evidence for all functions - as well as suboptimal distinctiveness between some conceptual areas - it provides a means to bridge gaps in multiple domains.

This model allows an integration of psychology and psychotherapy, transcending the boundaries of different therapeutic schools and diagnostic categories. It also helps to bridge the divide between practice and research, as well as between idiographic and nomothetic perspectives. Furthermore, it offers a pathway for reconciling qualitative and quantitative research approaches in the field of psychotherapy.

By focusing on change through process analysis, rather than solely relying on pre-post measurements with a content-based focus, the model enables the capture and evaluation of

psychotherapy courses and effects both intra- and inter-individually. This approach not only aligns with the central aspect of psychological flexibility as a marker of health, which describes the potential for change, but also helps to explain numerous phenomena from both research and patient perspectives. For instance, the model can elucidate why patients may not feel steady progress throughout therapy, attributing this to phase transitions where 'work' must accumulate before a change occurs. It also sheds light on why changes can sometimes be difficult to initiate but then suddenly become sustainable, explaining this through a new organization after a phase transition. Additionally, it offers insights into why improvement often follows critical moments, such as rupture repair sequences or suicidal crises, by conceptualizing critical instability as a moment of departure from homeostasis where change becomes possible in either direction.

Considering these contributions, we appeal to greater courage in several areas of psychotherapy research and practice. Firstly, we encourage more boldness in developing theories, pursuing integration, and embracing the possibility of errors. This represents a shift away from the 'toothbrush problem', where researchers tend to create their own narrow theories (Mischel, 2008). Instead, we advocate for an open model that can be modified and is designed for integration with other theories and findings. Secondly, we call for increased implementation of scientific principles in clinical practice. This includes introducing quality standards and regularly evaluating therapy progress and outcomes within therapeutic settings. Finally, we urge for more practical considerations in scientific research, such as developing idiographic models that allow for direct application, implementation, and individualization. This also involves creating more flexible and complex models that can accommodate comorbidity and the intricacies of real-world clinical presentations.

By adopting this integrative and dynamic approach, the field of psychotherapy can move towards a more comprehensive understanding of therapeutic processes and outcomes, ultimately enhancing the effectiveness of interventions and improving patient care.

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# Appendix

## Appendix A: Equations of the Variables

Equations for each variable: E emotion, I insight, M motivation to change, P problem intensity and S success.

$$E(E,I,P,S,c,r,m) = \frac{1}{1+e^{-10\,E}} - c + \frac{1}{1+e^{-20\,I\cdot\left(1-\frac{c+r}{2}\right)+5}} + \frac{\frac{-1}{1+e^{\left(2+3\cdot\left(1-\frac{c+m}{2}\right)\right)\cdot P}} + 0,5 + 0,5\cdot\left(1-\frac{c+m}{2}\right)}{1+e^{25\cdot\left(1-\frac{c+m}{2}\right)\cdot\left(P-0,2-0,75\cdot\left(1-\frac{c+m}{2}\right)\right)}} + \frac{1,25}{1+e^{5S-0,5}} - 0,5 - 0,5\,m$$

$$I(E,M,S,a,c) = \frac{1}{1+e^{-20\,E\cdot\left(\frac{a+c}{2}\right)+5}} + \frac{1}{1+e^{-20\,M\cdot\left(\frac{a+c}{2}\right)+5}} + \frac{1}{1+e^{-20\cdot|S|\cdot c+5}}$$

$$M(P,S,r,m) = \frac{1,261}{\left(1+e^{(P-0,05-0,85\,m)\cdot(10,1+19,9\,m)}\right)\cdot\left(1+e^{-(P-0,43+0,03\,m)\cdot(7-3\,m)}\right)} + \frac{-1}{1+e^{5\,S}} + \frac{r+m}{2}$$

$$P(E,S,c,r) = \frac{1}{1+e^{-10\,E}}\,c + \frac{1,2}{1+e^{5\,S-0,5}} - 0,2 - 0,8\,r$$

$$S(E,I,M,P,S,a,c,m,r) = \frac{1,3}{1+e^{5\,E-0,5}} - 0,65 + 0,35\cdot(c+m-1) + \frac{1}{1+e^{-20\,I\cdot\frac{(a+m+r)}{3}+5}} + \frac{1}{1+e^{-20\,M\cdot\frac{(a+m+r)}{3}+5}} - \frac{1}{1+e^{20\,M\cdot\left(1-\frac{(a+m+r)}{3}\right)+5}} + \frac{1,25}{1+e^{5\,P-0,5}} - 0,5 - 0,5\cdot\left(1-\frac{c+m}{2}\right) + \frac{1}{1+e^{-10\,S}} + \frac{m+r}{2} - 1$$

## Appendix B: Functions of the Parameters

Functions for each parameter (a therapeutic alliance, c cognitive competencies, m motivation to change as trait, r behavioral resources). An explanation of the weights *w*, constants and saturation function *s* can be found in Schöller et al. (2018, p.448).

$$a_t = a_{t-1} + s_a \cdot w_a \cdot a_{t-1} \cdot \frac{1}{2}(f_{S,t,n} - f_{E,t,n})$$

$$c_t = c_{t-1} + s_c \cdot w_c \cdot c_{t-1} \cdot \frac{1}{3}(f_{I,t,n} + f_{S,t,n} + r_{t-1})$$

$$m_t = m_{t-1} + s_m \cdot w_m \cdot m_{t-1} \cdot \frac{1}{4}(-f_{E,t,n} - f_{P,t,n} + f_{M,t,n} + f_{S,t,n})$$

$$r_t = r_{t-1} + s_r \cdot w_r \cdot r_{t-1} \cdot \frac{1}{2}(f_{S,t,n} + c_{t-1})$$

## Appendix C: Matrix of the Variables

Detailed matrix of the five variables, color-coded with each theory supporting each variable. The corresponding color-coding is depicted below as well.

**transdiagnostic processes**

- emotion regulation
- experiential avoidance
- cognitive fusion/defusion
- psychological flexibility

**motivation & psychological needs**

- motivation
- needs

**miscellaneous**

- example disorders
- other

**psychotherapy 'schools'**

- CBT, behaviorism & learning theories
- psychodynamic schools
- humanistic & emotion focused approaches
- common factors & integrative models

**psychology and psychotherapy**

- positive psychology: resilience and resources
- cognitive psychology
- developmental psychology
- general psychiatry & psychotherapy

| E | |
|---|---|
| **Author/Group** | **Theory** |
| Freud | pleasure and displeasure |
| Baumeister | core affect: distinction of desirable and undesirable |
| Grawe | need for increasing pleasure and avoiding pain |
| Behaviorists | reinforcement and punishment |
| Watson | positive and negative affect scale (PANAS) |
| RDoC | positive and negative valence system |

| P | |
|---|---|
| **Author/Group** | **Theory** |
| Rogers, Kriz | state of incongruence |
| Common Factors | symptom severity as part of the patient variable |
| Seligman | symptom severity central to pathologies |

| | |
|---|---|
| Severity as central assessment of pathologies | hierarchical taxonomy of psychopathology |
| | symptom severity checklist 90 |
| | therapy process questionnaire |

| M | |
|---|---|
| **Author/Group** | **Theory** |
| Wassermann et al. | Motivation as a construct for purposeful and goal-directed behavior |
| Grawe | Rubicon model as a metaphor for different phases of motivation, volition and action |
| Prochaska | trans-theoretical model of change |
| Deci & Ryan | self-determination theory (SDT): interconnectedness of motivation and psychotherapeutic change |

| I | |
|---|---|
| **Author/Group** | **Theory** |
| Psychotherapy | conscious meaning shift |
| Problem Solving | insight in the problem solving process |
| CBT | exposition treatments: imagery rescripting (trauma), exposition therapy (anxiety, OCD) |
| Psychodynamic Approaches | immediate experiencing |
| Grawe | clarification perspective |
| Common Factors | insight as process-/learning factor |

| S | |
|---|---|
| **Author/Group** | **Theory** |
| Grawe | success as an indicator for better satisfaction of needs |
| CBT | treatments for re-introducing success experience and increasing self-efficacy (behavioral activation) |
| Rogers | decreasing incongruence as success |

## Appendix D: Matrix of the Parameters

Detailed matrix of the five parameters, color-coded with each theory supporting each variable. The caption of the color-coding can be found in APPENDIX C: MATRIX OF THE VARIABLES (P. 326) .

| a | |
|---|---|
| **Author/Group** | **Theory** |
| | *attachment as a trait* |
| attachment as basic need | need to belong<br>suport and autonomy<br>need attachment |
| Research Domain Criteria | affiliation and attachment dimension |
| Big 5 | personality dimension of extraversion/introversion |
| | *attachment and the therapeutic relationship/alliance* |
| CBT | alliance as necessary condition for interventions |
| Freud | alliance central in psychoanalyis (transference, countertransference) |
| psychodynamic therapies | alliance as the framework for therapeutic processes |
| Bordin | pantheoretical concept of therapeutic alliance |
| Rogers | quality of the relationship (e.g. unconditional positive regard) |
| Grawe | alliance involved in all working mechanisms |
| Common Factors | effects of alliance established factor |

| c | |
|---|---|
| **Author/Group** | **Theory** |
| ICD-11 | personality assessment |
| Developmental theories | development of cognitive competencies in children similar to the psychotherapeutic process |
| Piaget | cognitive competence as process of assimilation<br>scaffolidng |

| | |
|---|---|
| Gross | emotion regulation |
| Bateman & Fonagy | mentalization |
| | metacognition |
| | self reflection |
| Kabat-Zinn | mindfulness |
| OPD | personal structural maturation and development |
| Common Factors | cognitive dimension as important change factor |

| r | |
|---|---|
| **Author/Group** | **Theory** |
| resource perspective | anything that helps patients and promotes self-healing powers |
| | solution-focused brief therapy |
| | salutogenesis concepts |
| problem solving | problem solving as balance of internal (resources) and external demands |
| CBT | interventions enhancing and activating behavioral resources (problem solving training, behavioral analysis, roleplays, etc.) |
| Grawe | mechanism resource activation |
| Common Factors | activation and learning of behavioral competencies |

| m | |
|---|---|
| **Author/Group** | **Theory** |
| approach and avoidance motivation | approach and avoidance motivation, and the relation to security and arousal |
| self efficacy | self efficacy expectations |
| | self determination theory |
| | learned helplessness |
| | negative cognitive triad |
| common factors | hope and expectancy effects |
| | demoralization of patients |

## Appendix E: Matrix of the Functions

Detailed matrix of the 16 functions, color-coded with each theory supporting each function. The caption of the color-coding can be found in APPENDIX C: MATRIX OF THE VARIABLES (P. 326) .

| | E | P | M | I | S |
|---|---|---|---|---|---|
| E | **E → E; E(E,c)**<br>**Theory**<br>emotion regulation<br>level of structure OPD<br>example: emotion regulation disorders and processes (BPD, rumination)<br>**mediating parameters**<br>cognitive competencies c | **E → P; P(E,c)**<br>**Theory**<br>interlacing negative emotions and symptom severity<br>negative emotions and symptom burden<br>attenuating effect of positive emotions on symptom severity<br>**mediating parameters**<br>cognitive competencies c | **E → M** | **E → I; I(E,a,c)**<br>**Theory**<br>confronting unpleasant truths<br>focusing work: emotional arousal in the therapeutic process<br>self-exploration process<br>process-experiential approach<br>process of problem actualization<br>engagement with painful material<br>‚follow the pain' as maxim in emotion focused therapies<br>activation of states of mind<br>therapeutic cycle model: connecting emotion and cognition<br>self-explication process, depth of processing<br>**therapeutic interventions & dysfunctional patterns of E → E**<br>classical exposition interventions in CBT<br>rescripting as exposition in CBT<br>importance of arousal: emotional processing theory<br>importance of arousal: dual representation theory<br>rupture repair sequences<br>transdiagnostic factor of experiential avoidance<br>**mediating parameters**<br>therapeutic alliance a<br>cognitive competencies c | **E → S; S(E,c,m)**<br>**Theory**<br>positive emotions as indicator for a good satisfaction of needs<br>broaden and build hypothesis<br>subjective well-being research<br>nourishing aspect of positive emotions<br>metatherapeutic processing<br>usage of positive emotions in CBT interventions<br>**mediating parameters**<br>cognitive competencies c<br>motivation as trait m |
| P | **P → E; E(P,c,m)**<br>**Theory**<br>dysfunctional emotion regulation in disorders<br>emotion dysregulation as transdiagnostic factor<br>**mediating parameters**<br>cognitive competencies c<br>motivation as trait m | **P → P** | **P → M; M(P,m)**<br>**Theory**<br>incongruence as a driver for change<br>learned helplessness<br>**mediating parameters**<br>motivation as trait m | **P → I** | **P → S; S(P,c,m)**<br>**Theory**<br>cognitive defusion<br>psychological flexiblity<br>ADHD as prototypic disorder<br>**mediating parameters**<br>cognitive competencies c<br>motivation as trait m |

| | E | P | M | I | S |
|---|---|---|---|---|---|
| **M** | **M → E** | **M → P** | **M → M** | **M → I; I(M,a,c)**<br>**Theory**<br>psychiatric understanding of insight<br>transtheoretical model of change<br>**mediating parameters**<br>therapeutic alliance a<br>cognitive competencies c | **M → S; S(M,a,m,r)**<br>**Theory**<br>cognitive psychology: incentives and motivation<br>autonomous motivation (self determination theroy)<br>transtheoretical model of change<br>need satisfaction and motivational clarification<br>teleonomic model of subjective well being<br>low approach motivation as a characteristic of disorders<br>**mediating parameters**<br>therapeutic alliance a<br>motivation as trait m<br>behavioral skills r |
| **I** | **I → E; E(I,c,r)**<br>**Theory**<br>confronting negative emotions lead to a relief and increase in positive emotions<br>flooding<br>confrontational trauma treatments (rescripting etc.)<br>psychodynamic theories: relief after confronting suppressed conflicts<br>emotion focused therapies<br>**mediating parameters**<br>cognitive competencies c<br>behavioral resources r | **I → P** | **I → M** | **I → I** | **I → S; S(I,a,m,r)**<br>**Theory**<br>increased feelings of mastery<br>contextual model of psychotherapy<br>**mediating parameters**<br>motivation as trait m<br>behavioral skills r<br>therapeutic alliance a |
| **S** | **S → E; E(S,m)**<br>**Theory**<br>reciprocal relation of success and happiness<br>therapeutic progress as self-actualization<br>**mediating parameters**<br>motivation as trait m | **S → P; P(S,r)**<br>**Theory**<br>progress monitoring<br>broaden and built hypothesis: success as a buffer<br>resilience and coping<br>**mediating parameters**<br>behavioral resources r | **S → M; M(S,m,r)**<br>**Theory**<br>approach motivation and self-determination<br>induction of positive expectations<br>motivating effect of satisfaction of needs<br>problem solving: locus of control and self efficacy<br>generic model of psychotherapy<br>depression as prototypic disorder<br>**mediating parameters**<br>motivation as trait m<br>behavioral resources r | **S → I; I(S,c)**<br>**Theory**<br>quasi-experimental character of successful behavior<br>anxiety disorder as prototypic disorder<br>**mediating parameters**<br>cognitive competencies c | **S → S; S(S,m,r)**<br>**Theory**<br>Lewinsohn's depression model<br>Beck's depression model<br>**mediating parameters**<br>motivation as trait m<br>behavioral resources r |

# German Summary

Die Arbeit beschäftigt sich mit der theoretischen Fundierung des dynamischen, non-linearen Modells der Psychotherapie von Günter Schiepek, zuerst vorgestellt in Schiepek et al. (2017).

## Einführung: Historische Perspektive

Im ersten Teil wird die Geschichte der Psychotherapie und der Psychotherapieforschung beschrieben, die zum aktuellen Forschungsparadigma führten. Dieses ist durch ein medizinisches Modell von Psychotherapie geprägt, d.h. es werden linear-kausale Ursache-Wirkungszusammenhänge sowohl bei Symptomatik, als auch Interventionen angenommen, obwohl sowohl Symptomatik, als auch der psychotherapeutische Veränderungsprozess non-lineare Phänomenen vorweisen (Wampold et al., 2018). Das medizinisch-lineare Modell prägt auch die aktuelle Forschungslandschaft, die v.a. von randomisiert kontrollierten Forschungsdesigns (randomized-controlled trials, RCT) mit prä-post-Messungen bestimmt ist.

Das aktuell vorherrschende Paradigma bringt durch Fokus auf Linearität, Randomisierung und damit Nomothetisierung, einige Limitationen mit sich. Hierunter fallen u.a. regelmäßige Verletzungen statistischer Annahmen (Ergodizität, Homogenität) die eine mangelnde Übertragbarkeit der Ergebnisse mit sich bringen, mangelnde Erklärung von Komorbiditäten, eine Vernachlässigung der idiographischen Perspektive und non-linearer Daten, als auch eine Unterentwicklung von Methoden zur Auswertung non-linearer Daten. Dadurch können wichtige Prozesse und Phänomene des Psychotherapieprozesses nicht erfasst und ausgewertet werden, was u.a. die Erklärung von Wirkmechanismen einschränkt. Zudem sorgt die Dominanz der RCTs für eine stärkere Hypothesenprüfung, als -generierung, was zu einer verkümmerten übergreifenden Theoriebildung, als auch zu zersplitterten Micro-Theorien führt (Borsboom et al., 2013).

## Synergetik als neues Paradigma

Im Rahmen dieser Arbeit schlagen wir hierfür die Systemtheorie als alternatives Paradigma vor, das sowohl die notwendige Theorie, als auch Methodik mitbringt, um non-lineare prozessbasierte Therapiedaten und -theorien zu erheben, auszuwerten und zu entwickeln (Kazdin, 2009; Borsboom et al., 2013; Cuijpers et al., 2019). Haken und Schiepek (2010) haben

mit der Synergetik bereits die Systemtheorie auf die Psychologie und Psychotherapie angepasst. Die darauf entwickelten Grundsätze werden in der Arbeit vorgestellt, darunter Grundbegriffe wie System, States, Trait, Ordnungs- und Kontrollparameter. Ebenso werden auch Definitionen basierend auf der Synergetik für psychische Erkrankungen und Psychotherapie vorgestellt, die Dynamik und Prozessorientierung in den Vordergrund stellen.

Die Vision der Arbeit ist, dass mit Hilfe von prozessbasierten Daten und Theorien die Wirksamkeitsforschung und -praxis von Psychotherapie verbessert werden kann.

**Hauptteil: Beschreibung des Modells mit Variablen, Parametern und Funktionen**

Der Hauptteil der Arbeit beschreibt das Modell selbst, das ein Bezugssystem für die Erfassung von Psychotherapie und psychischen Erkrankungen zur Verfügung stellen soll, das non-lineare und komplexe Prozesse erfassen, analysieren und auch simulieren kann.

Dies funktioniert mit Hilfe von "generellen Veränderungsdimensionen", d.h. einem Set aus Variablen und Parametern, auf denen die Veränderung in der Therapie abgebildet wird. Konkret umfasst das Modell fünf Variablen (States) und vier Parameter (Traits, Persönlichkeitseigenschaften). Variablen und Parameter bewegen sich auf unterschiedlichen Zeitskalen, d.h. Variablen fluktuieren stündlich und täglich, wohingegen sich Parameter sich deutlich langsamer verändern, dafür jedoch längerfristige Veränderungen bewahren können. Im Rahmen von Psychotherapie wird versucht über eine konsistente Änderung von States, eine Veränderung von Traits zu erreichen. Somit besteht die Möglichkeit, dass die Entwicklung über die Therapie hinaus, durch die Manifestierung in den Traits, anhält.

Bisherige mathematische und theoretische Modelle zu Psychotherapie, zur Psyche und zu spezifischen Erkrankungen, wie das Generic Model of Psychotherapy (Orlinsky et al., 1986), die Psychologische Psychotherapie von Grawe (2000), die Research Domain Criteria (RDoC, 2024) oder transdiagnostischen Prozessen (Morris & Mansell, 2018) wurden hinsichtlich ihres Potentials Psychotherapie zu erfassen, analysieren und zu erklären beleuchtet. Auf Basis dieser Konzepte, als auch der Forschung zu gemeinsamen Wirkfaktoren in der Psychotherapie (Common Factors), wurden die fünf Variablen und vier Parameter als "generelle Veränderungsdimensionen" hergeleitet.

*Die fünf Variablen*

Die fünf Variablen sind E Emotion, M Motivation, I Insight (Einsicht, Erkenntnis), P Problemintensität, S Success (Erfolgserleben).

E ist eine bidimensionale Variable, die dysphorische, negative Emotionen, wie Angst, Ärger, Schuld, auf der einen Seite und positive Emotionen, wie Freude, auf der anderen Seite umfasst. Damit verknüpfte Theorien sind z.B. die "core affects" nach Baumeister et al. (2001), das Grundbedürfnis nach Lust und Unlustvermeidung nach Grawe (2000), oder das positive und negative Valenzsystem der RDoC (2024).

M beschreibt die Veränderungsmotivation als State, die sich z.B. in der Bereitschaft zur aktiven Therapiebeteiligung zeigt. Die Selbstbestimmungstheorie von Deci & Ryan (2011), das von Grawe aufgeführte Rubikon-Modell mit den Phasen der Motivation (Grawe, 2000), als auch das transtheoretische Modell der Veränderung nach Prochaska & Velicer (1997) bieten hier den theoretischen Rahmen.

I umfasst Einsichts- und Erkenntnismomente der Therapie, die helfen neue Perspektiven auf bisherige Probleme, Kognitionen, Motivationen oder Verhaltensweisen zu erlangen. Hierunter fallen auch Konfrontationen mit bisher vermiedenen Kognitionen, Emotionen, Erfahrungen oder Konflikten. Theoretisch knüpfen hier der Mechanismus der Klärungsperspektive von Grawe (2000) an, psychodynamische Techniken und Befunde zu direktem Erleben (Hill, 2007; Johansson, 2010), Konfrontationstechniken der kognitiven Verhaltenstherapie (Exposition, Imaginatives Überschreiben; Foa et al., 2014; Margraf & Schneider, 2018) und Theorien zu Problemlösen (Bowden et al., 2005; Weisberg, 2015).

P beschreibt die erlebte Problem- und Symptomintensität, die auf humanistische Theorien bzgl. Inkongruenz als Indikator für Leidensdruck (Rogers, 1957; Kriz, 2014), die Common-Factors Forschung (Fiedler, 2012), und etablierten Erfassungssystemen zu Leidensdruck als zentraler Punkt von Psychopathologie (Seligman, 2019; Kotov et al., 2017; Vaurio, 2011; Schiepek et al., 2019a) zurückgreifen.

S beschreibt wahrgenommenen therapeutischen Erfolg, Fortschritt im Therapieprozess und die Zuversicht auf einen erfolgreichen Therapieverlauf. Diese Variable ist insbesondere wichtig, um die (Persönlichkeits-)Entwicklungsperspektive von Psychotherapie zu erfassen, die den therapeutischen Ansatz von dem medizinisch-medikamentösen Ansatz unterscheidet, der vor allem auf eine Symptomreduktion abzielt, der durch P erfasst werden kann. Erfolgserleben als eigener Effekt durch eine Reduktion der Inkongruenz nach Rogers (1957), Fortschrittsempfinden als Indikator für eine bessere Erfüllung von Bedürfnissen

(Grawe, 2000) und kognitiv-behaviorale Techniken zur Förderung von Erfolgserleben (u.a. Verhaltensaktivierung; Margraf & Schneider, 2018) sind hier zusammenhängende, unterstützende Theorien.

*Die vier Parameter*

Die vier Parameter sind a therapeutische Beziehung, c kognitive Kompetenzen, r behaviorale Ressourcen und m Motivation als Trait (Schiepek et al., 2017).

a deckt zwei Aspekte ab: zum Einen umfasst sie die (Arbeits-)Allianz, die Qualität der therapeutischen Beziehung und die Zusammenarbeit mit dem/der Therapeut/in. Zum anderen fällt hierunter auch die Fähigkeit vertrauensvolle, sichere Bindungen einzugehen, im Sinne einer Bindungsdisposition. Die therapeutische Beziehung als zentraler Faktor in der Psychotherapie wurde bereits von Freud (1939), Rogers (1957), Bordin (1979), Grawe (2000), als auch der Common-Factors Forschung (z.B. Wampold, 2023) hervorgehoben. Den Bindungsaspekt, der durch a abgedeckt wird, wird von Bedürfnis- und Bindungstheorien (Baumeister & Leary, 1995; Ryan & Deci, 2008; Grawe, 2000), als auch den RDoC (2024) gestützt.

c umfasst kognitive Kompetenzen, die Fähigkeiten zu Emotionsregulation, Mentalisierung, Selbstreflektion und das Strukturniveau im Sinne der Operationalisierten Psychodynamischen Diagnostik (OPD; Cierpka et al., 2014). Viele verschiedene Theorien fließen in diese Variable ein, u.a. das Konzept der kognitiven Kompetenzen nach Piaget (2010), Emotionsregulation nach Gross (2015), Mentalisierung und Metakognition nach Bateman und Fonagy (2019, 2016), als auch die kognitive Dimension als Wirkfaktor im Rahmen der Common-Factors Forschung (Huibers & Cuijpers, 2015).

r beschreibt die Verhaltensressourcen und -fertigkeiten von Personen. Je nach behavioralen Ressourcen ist das Umsetzen von Verhaltensänderung oder auch das Lösen von Problemen erleichtert oder erschwert. Theorien aus dem Bereich der Problemlöseforschung (Heppner et al., 2004), der Resourcenperspektive in der Psychotherapie (Schiepek & Matschi, 2013; De Shazer & Dolan, 2008; Antonovsky, 1987), der Common-Factors Forschung (Lambert & Ogles, 2004), kognitiv-behavioralen Interventionen (Margraf & Schneider, 2018), als auch dem Mechanismus der Ressourcenaktivierung nach Grawe (Grawe, 2000) knüpfen an den Parameter r an.

m stellt den vierten Parameter da, der Veränderungsmotivation als Trait (Persönlichkeitsmerkmal), Selbstwirksamkeit und positive Erwartungen in die eigene Entwicklung umfasst. Verschiedene Theorien zu Selbstwirksamkeit, wie z.B. die erlernte Hilflosigkeit (Seligman et al., 1979), die negative kognitive Triade von Beck (1979) oder SDT (Deci & Ryan, 2000), als auch Konzepte zu Annäherungs- und Vermeidungsmotivation (Scheffer & Heckhausen, 2018), 'Gesundheitspläne' im Rahmen der Control-Master-Theory (Silberschatz, 2013) und die Common Factors Forschung bilden die theoretische Basis des Parameters (Lambert & Ogles, 2004; Wampold et al., 2018; Frank & Frank, 1993).

*Die 25 Funktionen*

Um die Wirkmechanismen der Psychotherapie noch besser erklären zu können, haben Schiepek et al. (2017) die Variablen und Parameter des Modells in Relation gesetzt. Aktuell bestehen hier 16 Funktionen, die im Hauptteil der Arbeit bezüglich theoretischer und empirischer Belege beleuchtet werden. Ebenso werden die 9 nicht inkludierten Funktionen bezüglich der Befundlage beurteilt und eine Empfehlung ausgesprochen, ob sie in zukünftige Versionen des Modells aufgenommen werden sollten.

Theorien, die in den Funktionen Eingang finden sind u.a. Theorien zur Emotionsregulation (Gross, 2015), transdiagnostische Prozesse (Nolen-Hoeksema et al., 2008; Hayes et al., 1996), das Strukturniveau nach OPD (Cierpka et al., 2014), Wirkmechanismen nach Grawe (2000) und der Common-Factors Forschung, als auch Ansätze der verschiedenen therapeutischen Schulen (humanistische Ansätze, emotionsfokussiertes Arbeiten, kognitiv-behaviorale und psychodynamische Perspektiven).

Eine Übersicht der verknüpften Theorien zu jeder Variable, jedem Parameter und jeder Funktion findet sich zu Beginn jeden dazugehörigen Kapitels. Die Tabellen **Table 1** (p. 62) und **Table 2** (p. 71) in Kapitel The Process of Generating 'General Dimensions of Change' (p. 57) , als auch die Matrizen in Appendix C: Matrix of the Variables (p. 326) , Appendix D: Matrix of the Parameters (p. 328) und Appendix E: Matrix of the Functions (p. 331) bieten ebenso einen Überblick über das Modell und die assoziierten Theorien.

*Die Differentialgleichungen*

Die Funktionen werden zudem noch pro Parameter und pro Variable zu gekoppelten nichtlinearen Differentialgleichungen integriert, sodass es eine Gleichung pro Parameter/Variable entsteht (Schiepek et al., 2016; Schöller et al., 2019). Sie stellen somit eine Übersicht

dar, über die Faktoren, die den Verlauf einer Variable bzw. eines Parameters beeinflussen. Die hier einfließenden Theorien werden auch noch einmal im letzten Kapitel des Hauptteils pro Gleichung zusammengefasst.

**Kritik und Perspektiven**

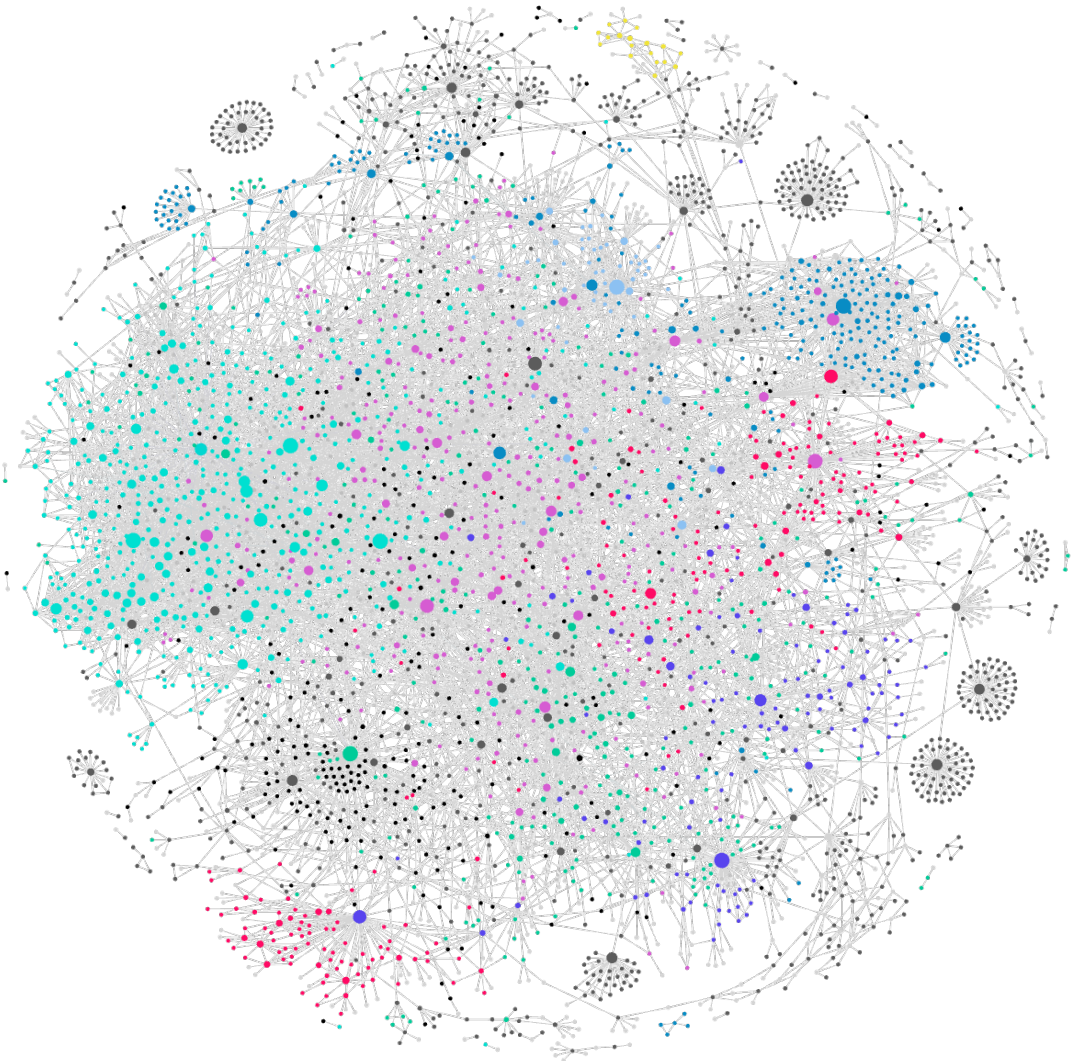
Im letzten Teil der Arbeit werden die Limitationen diskutiert, die v.a. mit den mathematischen Annahmen und Bedingungen, als auch der induktiven Theorieentwicklung einhergehen. Zudem wird die theoretisch bedingte Auswahl der Variablen, Parameter und der Wirkungsrichtungen in den Funktionen diskutiert. Basierend auf den Ergebnissen einer bestehenden Faktorenanalyse wird ein möglicher neuer Faktor, der körperbezogene Aspekte abdeckt, als Erweiterung im Modell beleuchtet (Schiepek et al., 2019). Auch werden die Einschränkungen der aktuellen, ergebnisfokussierten Forschungsergebnisse aufgezeigt, die ebenso die theoretische Fundierung eines prozessbezogenen Modells limitieren, da immer noch an vielen Stellen Belege basierend auf prozessuale Daten fehlen.

Zum Schluss werden noch einige Perspektiven aufgezeigt, die sowohl mögliche Anwendungsgebiete des Modells in Forschung und Praxis beleuchten, als auch Integrationen und Erweiterungen, wie physiologische Messungen, die in das Modell mit aufgenommen werden könnten.

## Epilogue

Lastly, before ending this thesis, I like to thank the developers of Obsidian, Erica Xu and Shida Li. Without this program and the support of the community, I would not have had the necessary tools to keep track of the many theories and to be able to produce the work in this form.

I would also like to thank the open-source developers of Zotero, the Better-BibTex plugin, the Obsidian plugins (Citations, Zotero Integration, Pandoc Reference List) and Chris Grieser (Alfred: Supercharged Citation Picker) for making their work available to the public.



*The image shows the graph generated in Obsidian from the notes that were created and used for this doctoral thesis. Turquoise are content notes on theories, papers and concepts, purple are basic terms of psychology, red and dark blue are basic terms of psychotherapy and disorders according to ICD-10.*