Title: Mechanisms of Change in Treatments of Personality Disorders: Introduction to the Special Section.

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Journal: Journal of personality disorders

Year: 2018 Jan

Issue: 32

Volume: Supplement

Pages: 1-11

DOI: 10.1521/pedi.2018.32.supp.1

RUNNING HEAD: INTRODUCTION TO THE SPECIAL SECTION

Mechanisms of Change in Treatments of Personality Disorders: Introduction to the Special Section

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Author Note/Acknowledgments: The Exploratory International Workshop, held at the Department of Psychiatry, University of Lausanne, Switzerland (February 3-5, 2016), was supported by SNSF grant IZ32Z0_164145/1 (to Dr. Kramer). The author acknowledges the Department of Psychiatry, Lausanne University Hospital and University of Lausanne for its support in the organization of the Workshop. The author acknowledges Sabine C. Herpertz, Kenneth N. Levy, Shelley McMain and J. Christopher Perry for their support and comments on an earlier version of this article.

On the importance of knowing why treatments work

Psychotherapy for personality disorders works. Meta-analyses demonstrate that for *bona fide* treatments, effects were comparable across different treatment models (e.g., Budge, Moore, Del Re, Wampold, Baardseth, & Nienhaus, 2013). The latter result was systematic for outcome studies for patients with any personality disorder (PD), including borderline personality disorder (BPD), except for isolated studies showing between-condition differences for two active and potent – *bona fide* – long-term treatments. Such isolated between-condition differences may be due to researcher allegiance effects (Budge et al., 2013). Despite recurrent hopes that certain treatments outperform others in terms of their effectiveness, direct comparisons are systematically frustrating. Some confusion about not knowing which treatment works best for which patient is maintained, indicating that the question asked may be too complex to answer. Most importantly, the understanding of how and why these treatments for PDs work still remains unaddressed (Clarkin, 2014; Kazdin, 2009). Knowing how and why treatments work not only helps to understand and deliver therapy in a more informed way, but may also orient interventions towards the actual core processes at play in each therapy. Such knowledge may help the therapist to increase his/her responsiveness on a moment-by-moment basis to a specific emerging patient characteristic or in-session process – the one contributing to the mechanism of change. Knowing about mechanisms of change may also inform personality pathology by studying change of structural processes. It is high time, as outlined by Clarkin (2014), psychotherapy research for personality disorders "raise the bar" and focus on mechanisms on change.

In a first step towards the understanding of how treatments work, the field has moved to the analysis of predictors of therapeutic change, for treatments of BPD (Barnicot, Katsakou, Bhatti, Savill, Fearns, & Priebe, 2012). This research has yielded somewhat contradictory results, but was able to secure two main findings: (1) the intensity of the

symptoms in BPD predicts the symptom reduction after treatment and (2) the therapeutic alliance predicts symptom reduction after treatment. The actual mechanisms of change at play – the changing forces driving the effects of treatment – still remain unaddressed.

Mechanisms, mediators, moderators

A mechanism of change may be defined as a changing variable systematically explaining the effect of treatment. In the present integrative Special Section, we will focus on patient's changing variables and features of the therapeutic collaboration, and we will not focus on therapist factors and interventions. In 2006, Castonguay and Beutler, along with a number of contributors (e.g., Fernandez-Alvarez, Clarkin, Del Carmen Salgueiro, & Critchfield, 2006; Smith, Barrett, Benjamin, & Barber, 2006), have outlined a research agenda for investigating mechanisms of change in treatments for PDs. They differentiated between participant (patient and therapist) factors, relationship factors, technical factors, along with an integrative viewpoint taking into account all perspectives. It appears that it may be most productive to focus on the *patient*'s changing processes and the changing features of the *therapeutic relationship* as central driving forces of outcome in treatments of PDs.

Kazdin (2009) defined several components composing a mechanism of change in psychotherapy research: (1) Association: the changing variable is related with symptom change; (2) Timeline: the change on the mechanism of change needs to be completed before the outcome is measured; (3) Plausibility: theory predicts change and its role for outcome; (4) Specificity: the observed change is sufficiently differentiated from other constructs and change variables; (5) Gradient: amount of change in the mechanism maps onto amount of symptom change; and (6) Consistency: the results are observed across studies; (6) Experimental manipulation: the change found holds true under controlled experimental conditions. This list foreshadows that the demonstration of a mechanism of change is done

best within a network of research programs, coordinated across research teams, and cannot be realized by a specific study, nor within a single therapy approach.

A mechanism of change is different from a mediator of change. According to Preacher and Hayes (2004), in order to test formal mediation in a study, a number of conditions need to be met. (1) The predictor is significantly related with outcome (i.e., direct treatment effect), (2) the predictor is significantly related with change in the mediator variable (i.e., treatment effect on the mediator), (3) the change in the mediator is significantly related to outcome (i.e., effect of the mediator on outcome), (4) in the complete model, where the effect of the mediator is controlled for, the treatment effect on outcome is eliminated or significantly lessened (residual treatment effect). For the latter, we describe a partial mediation, for the former a full mediation. It appears that the demonstration of mediation is one important step in the study of a patient or relationship change as mechanism of change, but not the only one. Finally, a mechanism and a mediator are both different from a moderator of change. A moderator variable in this context designates an intake feature of the patient (or the therapist or the context) influencing the link between the mechanism and outcome. Here we should not forget that the same variable can be both a moderator and a mediator of change.

When measuring such a variable in the psychotherapy process, it may be important to adopt an integrative – therapy-school independent – approach, where concepts from specific therapy forms are overcome, towards an empirical, generic and patient-near formulation of mechanisms of change. Or to quote L. Greenberg (1999, p. 1467; underlined by author): “We need to *observe* the process of change to provide us with the kind of *explanation* that involves a new understanding of what actually occurs rather than rely on automatic theoretical explanations from our favorite, often too strongly held, theory.”

Etiopathogenesis, pathological mechanism and mechanism of change

Etiological mechanisms, explaining the emergence of personality disorders – and BPD in particular (Stepp, Lazarus, & Byrd, 2016) – and the maintaining pathological mechanisms, are not necessarily the same as the mechanisms of change of the treatments of these disorders. Nevertheless, these etiological and pathological factors need to be incorporated into the understanding of change in treatments. The development of several personality disorders is marked by deficits in socio-cognitive processing (Herpertz, 2013). For BPD, it was discussed that the interaction between genes and environment may contribute to the weakening of the attachment system, hence contributing to impairment in mentalizing – thinking about the other and oneself in terms of intentions and goals (Fonagy, & Luyten, 2009; Fonagy, Luyten, & Bateman, 2015). The development of BPD, among other personality disorders, is marked by specific deficits in emotion processing (Herpertz, 2011). There is consistent evidence for BPD that emotion awareness, recognition and expression lacks precision which contributes to the level of symptoms across laboratory and clinical studies. Specific aspects of emotion processing, in particular accurate emotion recognition and emotional empathy, lack in other PDs, such as narcissistic personality disorder (Ronningstam, 2016).

Transformation processes across psychotherapy entail different dynamics than the dynamics related to the constitution of the psychopathology in the development. A recent case was made for trauma memory, where it was argued that memory reconsolidation describes the complex interaction between trauma memory retrieval, emotion arousal and emotion change in therapy, a process which contrasts with the conditioning processes at play in the actual consolidation of this trauma memory (Lane, Ryan, Nadel & Greenberg, 2015). The growing knowledge of etiological factors and pathological mechanisms is central for the contextual understanding of the processes of change in treatments; integrating what we know from the developmental perspective into mechanisms of change research is therefore an essential task.

Mechanisms of change in treatments for personality disorders: a shortlist

For treatments for patients with PDs, a number of mechanisms are discussed in the literature.

Emotional processing, composed by aspects such as emotion awareness, experiencing of emotion and emotion transformation, was reported as possible mechanism of change in several treatment forms for patients with PD, in particular BPD (McMain, Pos, & Iwakabe, 2010). Neacsiu, Rizvi and Linehan (2010) showed for Dialectical-Behavior Therapy (DBT) for BPD that the patient's use of specific skills in emotion regulation mediated symptom reduction. Other studies have provided evidence for other aspects of emotional processing: the cognitive problem solving and emotional balance (McMain, Links, Guimond, Wnuk, Eynan, Bergmans & Warwar, 2013), the increase in in-session use of assertive anger (Kramer, Pascual-Leone, Berthoud, de Roten, Marquet, Kolly, Despland, & Page, 2016), the amount of global distress experienced by patients (Berthoud, Pascual-Leone, Caspar, Tissot, Keller, Rohde, de Roten, Despland, & Kramer, 2017), the decrease in alexithymia (Ogrodniczuk, Joyce, & Piper, 2013), the decrease in behavioral coping (Kramer, Keller, Caspar, de Roten, Despland, & Kolly) and the in-session emergence of self-compassion and rejecting anger (Kramer, Pascual-Leone, Rohde, & Sachse, 2016). It appears that emotional processing may be studied on a moment-by-moment basis in psychotherapy. From a neurobiological perspective, Schnell and Herpertz (2007) showed neural correlates of emotional processing in patients undergoing inpatient DBT, with lessening of activation of the left amygdala and both hippocampi (i.e., facing negative stimuli) which were associated with treatment response. This is consistent with a decrease in amygdala reactivity after treatment reported by Goodman, Carpenter, Tang, Goldstein, Avedon, Fernandez, Mascitelli, Blair, New, Triebwasser, Siever and Hazlett (2014) and also with a greater neuronal connectivity, after treatment, between pre-frontal areas and the amygdala found by Schmitt, Winter, Niedtfeld, Herpertz and Schmahl (2016), suggesting systematic evidence for neurofunctional

underpinnings when the person is effectively reappraising emotional stimuli. Decrease in affective lability was associated with a decrease in activation in orbito-frontal regions, as well as in the striatum after treatment (Perez, Vago, Pan, Root, Tuescher, Fuchs et al., 2015).

Change in the patient's *socio-cognitive capacities* is a discussed putative mechanism of change in BPD (Choi-Kain & Gunderson, 2008; Fonagy, Luyten & Bateman, 2015). Levy, Meehan, Kelly, Reynoso, Weber, Clarkin and Kernberg (2006) examined change in three forms of psychotherapy – transference-focused psychotherapy (TFP), DBT and supportive therapy – and found that TFP was associated with the increase of reflective function, along with development of more secure attachment patterns for some patients in this condition. Consistent results were presented by Fischer-Kern, Doering, Taubner, Hörz, Zimmermann, Rentrop, Schuster, Buchheim and Buchheim (2015) for BPD and, using a different assessment tool, by Dimaggio, Procacci, Nicolo, Popolo, Semerari, Carcione and colleagues (2007) for narcissistic and avoidant PDs. Other research has underlined the moderating role of mentalizing capacities for outcome for different categories of PD (Antonsen, Johansen, Rø, Kvarstein, & Wilberg, 2016; Gullestad, Johansen, Hoglend, Karterud, & Wilberg, 2013). From a linguistic-cognitive perspective, a decrease in in-session frequency of words describing negative emotions over different types of psychotherapy was observed (Arntz, Hawke, Bamelis, Spinhoven, & Molendijk, 2013) and a decrease in in-session negative cognitive biases over short-term psychotherapy (Kramer, Caspar, & Drapeau, 2013) was found. It appears that changes in socio-cognitive, and cognitive, capacities seem to occur both on a moment-by-moment basis and between the sessions.

Increase in insight and clarification was assumed to be a central mechanism of change in a number of psychotherapies. Johansson, Hoglend, Ulberg, Amlo, Marble, Bogwald, Sorbye, Sjaastad and Heyerdahl (2010) showed the mediating role of increase of insight in long-term therapy for a sample out of which half had a PD. From a long-term perspective,

Bond and Perry (2004) demonstrated that the patient's use of defense mechanisms changed over the years in treatment toward more mature, self-reflective and adaptive defenses.

The *therapeutic alliance*, along with other so-called "common factors" of psychotherapy, is often cited as being responsible for change in treatment for PDs (Smith, Barrett, Benjamin, & Barber, 2006). However, the actual evidence for the alliance, or its rate of change over the course of treatment, as mechanism of change in treatments for PDs, is inconsistent, so far (Forster, Berthollier, & Rawlinson, 2014). This might be due to psychopathological specificities of patients with BPD when engaging in treatment, such as moment-by-moment ruptures and resolutions, which are not captured by global and evaluative assessments of the therapeutic alliance. As shown by Cash, Hardy, Kellett and Parry (2013), the study of moment-by-moment changes in the cooperation is particularly promising.

Methodological considerations

It appears that the complexity of the personality disorders warrants for an interdisciplinary approach to defining, delineating and assessing mechanisms of change, including, among others, methods from psychotherapy process and outcome research, physiological and neuroimaging research. This is consistent with the NIMH Research Domain Criteria (RDoC) initiative (Insel & Gogtay, 2014) which focuses on a limited number of psychological variables, such as regulation, perception and memory (instead of diagnostic categories). The RDoC initiative favors treatment-independent translational research and tries to elucidate neurobiological markers of generic processes. It was demonstrated that this general perspective was particularly helpful in understanding the etiological role of mentalizing in the context of BPD (Sharp & Kalpakci, 2015), however, the systematic articulation of etiologically relevant RDoC factors with the actual moment-by-moment changes observed in the psychotherapy session, and their link with outcome, still remains a challenge. This is because there is the difficulty in translating research between a nomothetic

framework and a psychotherapy-relevant idiographic – personalized – framework. In the study of emotional processing – one of the most promising candidates in the study of mechanisms of change –, Pascual-Leone, Herpertz and Kramer (2016) proposed a possible solution for the articulation between idiographic and nomothetic research paradigms. They propose the use of individualized stimuli in the context of controlled experimental designs by systematically drawing on the patient's inner – subjective – metric, as assessed in a combination of the experiment's manipulaton checks.

In addition to such integrative experimental designs assessing the mechanisms of change in treatments, we would like to underline that the phenomenon of study – the gem that explains the effect of treatment – may be elusive and may fluctuate on a moment-by-moment, minute-by-minute, hour-by-hour, basis. Ecological momentary assessment may help to capture the short-term fluctuations when measuring problems associated with PDs (Hepp, Carpenter, Lane, & Trull, 2016; Trull & Ebner-Priemer, 2013). The latter methodology helps to disentangle trait and state contributions, and their interaction, to the emergence and evolution of PDs (Hepp et al., 2016) and may be a promising avenue to assess mechanisms of change.

Finally, a potential pitfall of a shortlist as the one above may be its use, in a rather sterile debate, about the "best mechanism of change", analogue to the similarly sterile debate about the "best therapy form". In order to avoid such a pitfall, we consider that an important and often neglected innovation in mechanisms research stem from intensive – theory-building – psychotherapy case studies (Stiles, 2007). Our theories of change are certainly helpful and "practical" to paraphrase Lewin (1952), but all theories are *improvable*. Rigorously conducted psychotherapy case studies help deepen our understanding of the central mechanisms of change by letting "speak" the patient: his/her words may differentiate further and transform our theories of change.

Taken together, whereas most research has focused on specific aspects of emotion and socio-cognitive processing as mechanisms of change in treatments of PDs, it seems that the *timing and level of granularity* of the assessment of change in patients with PDs, as well as the systematic inclusion of the *idiographic* perspective, remain important challenges.

Proceedings of an exploratory international workshop for the next generation of researchers

In early February 2016, close to 30 researchers from 10 universities in Northern America and Europe came together in the small Swiss city of Lausanne for three days of common work on mechanisms of change in treatments for personality disorders. This exclusive gathering of researchers, funded by the Swiss National Science Foundation, made it possible to examine and discuss cutting-edge research and lay out new research ideas and agendas for the coming years. As such, the workshop was designed to foster interest in emerging researchers for the field of mechanisms of change in personality disorders.

What do we know and where do we go from here? This question has led through the integrative discussion in this emerging field. “Integrative”, because representatives of several therapy models participated in the workshop, as well as researchers and researcher-clinicians, and also because we included the broadest range of methodologies – mindful of their respective contributions and limitations –, such as psychotherapy process research, neurobiological research, controlled physiological research, self-report questionnaire research, qualitative research. A participative and playful methodology made this experience fruitful and stimulating. The present Special Section aims at conveying the spirit of the workshop: broad, cutting-edge, and integrative.

This Special Section

The present Special Section adopts an integrative patient-near formulation to mechanisms of change in treatments for personality disorders. All contributors are encouraged to discuss a central patient's process or the therapeutic relationship as agents of change, within the context of treatment(s) for different categories of PDs. Wherever possible, an exploration of the concepts with regard to alternative therapy models is encouraged.

There will be six original research articles, followed by three independent discussions. Each original research article will present previously unpublished data on specific changing patient or relationship variable(s) related to a treatment for PDs (except for the neurobiological contribution where an overview is more suitable). Each article will be first-authored by a participant from the exploratory workshop. As a whole, the Special Section outlines a multi-faceted and multi-layered perspective on where this field may move, what possible problems may arise and how they may be addressed.

Schnell and Herpertz (this issue) make a powerful case for an innovative and integrative – neuropsychotherapeutic – conception of change in psychotherapy. They articulate emotion processing and social cognition as the two core axes of analysis and intervention for BPD, as well as for chronic depression. Beyond the broad review, they outline a new modular approach to integrative psychotherapy.

Scala, Levy, Johnson, Kivity, Ellison, Pincus, Newman and Wilson (this issue) compare two samples of patients with BPD and without (but with anxiety disorder), with regard to day-to-day ecological momentary assessments (EMA) of affect regulation and identity instability. This study demonstrates a moderation effect of self-concept, as measured by the EMA, when linking negative affect and self-injurious urges. Interestingly, these effects are unrelated with the diagnosis.

Starrs and Perry (this issue) micro-analyze the long-term change processes in a small sample of patients with PDs and recurrent depression with regards to coping over the course of treatment. They find increase in coping effectiveness across treatment types, which seem to be modulated by the presence of personality pathology. Detailed clinical accounts illustrate the changes found.

Keller, Stelmaszczyk, Kolly, de Roten, Despland, Caspar, Drapeau and Kramer (this issue) analyze three sessions in a sample of patients with BPD undergoing a short-term treatment in terms of change in the use of in-session cognitive biases, within the context of a randomized controlled trial. They find a systematic decrease in negative cognitive biases over the course of treatment in the patients' in-session speech. Interestingly, this change is independent from the treatment condition.

Ehrenthal, Levy, Scott, and Granger (this issue) study in an experimental design the links between attachment insecurity, its relationship with social cognition, and the physiological stress response in a social performance task. They demonstrate a moderator effect of a developmental variable – attachment insecurity – on the link between early adverse experiences and the stress response. It appears that this effect holds true across diagnostic categories, including BPD.

Boritz, Barnhart, Eubanks and McMain (this issue) apply in a small sample a detailed process analysis to several sessions of psychotherapy for BPD, as part of a larger randomized controlled trial. They examine alliance ruptures and resolutions, as interactional manifestations of core interpersonal schemas in PDs, and relate them with symptom change. Interestingly, ruptures in the therapeutic alliance marked by patient withdrawal seem particularly difficult to repair in this population.

Three independent expert groups comment on the entire special section. Gunderson (this issue), Kealy and Ogrodniczuk (this issue) and Aafjes-van Doorn and Barber (this issue) outline current state of the art, specific problems and future directions in the field of mechanisms of change in treatments of personality disorders, inspiring the next generation of empirical research.

On behalf of all contributing authors, co-authors and discussants, I warmly thank the Journal of Personality Disorders for the generous possibility of presenting and discussing this research in the context of this Special Section. I thank 13 anonymous expert reviewers for their invaluable work on earlier versions of the articles included in the Special Section. May this Special Section contribute to “raise the bar” in the study of mechanisms of change in treatments for personality disorders.

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