Running Head: HEURISTICS IN BORDERLINE PERSONALITY DISORDER

Cognitive Heuristics in Borderline Personality Disorder across Treatment: A Longitudinal Non-Parametric Analysis

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Abstract

Objective: The development of a constructive therapeutic alliance may represent an important feature of interpersonal adaptation in clients with Borderline Personality Disorder (BPD). The present study explores cognitive heuristics as dynamic features of change in relationship with the therapeutic alliance in treatment of BPD.

Method: In total, $N = 60$ clients with BPD, are included in the present study. In the context of brief therapy, the therapeutic alliance (WAI) is assessed from the client and the therapist perspectives after each therapy session; cognitive heuristics are assessed three times (CERS). The data analyses are based on non-parametric clusters (kml3d) linked with the therapeutic alliance.

Results: The results showed that clusters of cognitive heuristics trajectories are linked with the client's therapeutic alliance ($t(55) = 2.30$, $p = .03$), but they remained unrelated with the evolution of the therapist's alliance.

Conclusions: These results are discussed with regard to the interpersonal adaptiveness of cognitive heuristics in the context of BPD undergoing treatment.

Key-Words: Cognitive Heuristics; Borderline Personality Disorder; Therapeutic Alliance; Change; kml3d

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INTRODUCTION

Cognitive heuristics prepare the individual for action; it remains an open question how helpful for *adaptive* action they are. In psychotherapeutic treatments, as in real life, an individual's productive adaptation may take several forms, each describing a productive process of change in therapy. Whereas emerging research demonstrates relevance of specific mechanismms of change for psychotherapy outcomes (Johansson, Hoglend, Ulberg, Amlo, Marble, Bogwald et al., 2010; Neacsiu, Rizvi, & Linehan, 2010), theoreticians have repeatedly argued that the client's step-by-step openness to a warm and prizing therapeutic relationship bond and agreement on tasks and goals – the therapeutic alliance – may represent a major indicator of adaptation in therapy (Flückiger, Del Re, Wampold & Horvath, 2018; Horvath, Del Re, Flückiger et al., 2011; Norcross, 2011; Wampold, 2015). In particular in the beginning of treatment, the therapeutic alliance may contribute to overcoming client's initial fears of personal contact observed in specific psychological disorders, for example borderline personality disorder (BPD; Fonagy, Luyten, Allison, & Campbell, 2017) – or to disconfirming unhelpful assumptions that therapy may be not be as effective as expected (Constantino, Arnkoff, Glass, et al., 2016) – and represents thus a major pathway of developing the capacity to trust in other human beings.

Heuristics are sets of mental operations which ignore, or discard, specific information (Gigerenzer & Brighton, 2011) and may therefore be considered as underpinned by cognitive biases. Humans – and to some extent animals – make decisions based on incomplete, or at times flawed, pieces of information, and trust their "gut" feeling and shortcuts. Whereas such

operations have long been considered as second-best by cognitive science (Kahnemann, 2011; Tversky & Kahnemann, 1974), we may now assume that under specific conditions, a human being relying on cognitive heuristics may be more effective that a human using a more traditional approach of decision making, the latter based on maximal amounts of information, precise measurement and complete computation (Gigerenzer, 2007; Gigerenzer & Brighton, 2011; Gilbert, 1998): less may be more. A baseball player who tries to compute the exact location where the ball, as it is already up in the air, may touch ground, taking into account all variables such as velocity, initial distance or direction of the wind, will be less effective than a baseball player who only focuses on one *key* variable: he can keep constant the angle of gaze while running in parallel to the movement of the ball (the "gaze heuristic" discussed by Gigerenzer, 2007). According to these authors, focusing on the most important piece of information and ignoring all other information, may serve the individual's adaptation and help him/her to move forward more effectively.

So far, it is unclear whether this hypothesis stemming from cognitive science holds true in psychotherapeutic processes for clients with psychological disorders (Baer, Peters, Eisenlohr-Moul, Geiger, & Sauer, 2012; Dimaggio, Semerari, Carcione, Procacci, & Nicolo, 2006) . In particular, we aim at testing the role of cognitive heuristics across the first few therapy sessions of clients with borderline personality disorder (BPD), when a positive and trusting therapeutic relationship appears as a crucial marker of an individual's sufficient adaptation to the helping environment (Fonagy et al., 2017; Wampold, 2015; Zanarini & Frankenburg, 2007). Will the aim of such interpersonal adaptation be linked with the client's cognitive heuristics? Will shortcuts in the client's reasoning, such as focusing on a single information, while ignoring other, potentially contribute to a trusting therapy collaboration in the beginning of therapy? Identifying such

helpful adaptive heuristics in these clients might contribute to conceptualizing novel paths for the development of the therapeutic alliance in psychotherapy for borderline personality disorder.

In psychotherapy and psychopathology research, cognitive heuristics are approached from a deficit-conception of specific cognitive biases or errors. It was assumed that the presence of cognitive biases, or biased thinking, might contribute to maintain depression (Clark, Beck, & Alford, 1999). Biased towards the negative information, selective abstraction toward helplessness, catastrophizing thoughts about the future and personalizing negative interpersonal cycles are understood as maintaining psychological disorders. To some extent, empirical research has confirmed the negative effects of biased thinking on mental health (Clark et al., 1999), although methodological problems of the validity of measures, the dynamic changes over time and the directionality of effects remained unaddressed. Of note, the self-reported questionnaires were criticized, in particular in the context of precise clinical assessment of the client's in-session narrative where the client's actual heuristic plays out in the interaction (Glass & Arnkoff, 1997). In order to address these problems, an observer-rated system aiming at the valid assessment of biased thinking in the client's narrative has developed (Cognitive Errors Rating Scale; CERS; Drapeau, 2013). Interestingly, studies did not find any overall between-group differences in terms of the overall in-session frequency of biased thinking used in semi-structured interviews, both when comparing clients with healthy controls and when comparing different client samples (Kramer, Drapeau, & Bodenmann, 2009; Kramer, Vaudroz, Ruggeri, & Drapeau, 2013). Whereas this lack of difference may be due to small sample size or selection biases, we may also consider that the commonly held hypothesis that healthy controls use a less biased reasoning was not confirmed by these in-depth and systematic analyses of the narratives. This may be interpreted as a challenge to the deficit-conception of a psychological disorder as

globally marked by biased thinking. A more complex conception of cognitive processes including sets of biased thinking – the heuristics, rather than the singular cognitive biases – is necessary.

Change over the course of psychotherapy in singular cognitive biases has yielded a similarly contrasting picture. Biased thinking is amenable by psychotherapy, but the meaning of the change remains unclear. A recent study described in a sample of psychodynamic psychotherapy an increase in the in-session frequency of positive cognitive biases (Kramer, Ortega, Ambresin, Despland, & de Roten, 2018), some of which were related with therapy outcome. These results may speak to the idea that higher frequencies of certain types of biased thinking may help the client to better adapt to the reality. This argument counters, again, the deficit-conception of biased thinking and it may also speak to the necessity of considering change in sets of biased thinking, rather than the change in singular biases. Finally, a process study based on a randomized controlled trial using the same observer-rated methodology examined change in biased thinking as potential mechanism of change in brief psychiatric treatments for borderline personality disorder (BPD; Keller, Stelmaszczyk, Kolly, de Roten, Despland, Caspar et al., 2018). Whereas the results showed a steady decrease in negative overgeneralizing over three timepoints, these changes remained unrelated with treatment outcome. Decreases in single cognitive biases were interpreted as indicator of a productive therapeutic process, but they seem not to be the driving the effect of the initial change in treatment for BPD: these changes are interpreted rather as a "by-product" of effective therapy.

Observing the in-session cognitive processes assures the anchoring of the phenomenon to be observed in the actual clinically relevant context, favoring high precision and high ecological validity of the measurement. Such an approach also optimally addresses the limitations related

with the self-report approach (Glass & Arnkoff, 1997). Whereas the in-session frequency of individual processes optimally operationalizes the concept of biased thinking, it fails to incorporate the more complex concept of cognitive heuristics. In this context, cognitive heuristics may be understood as a second-level operationalization of cognitive processes: it may be understood as the combination, over time, of individual biases observed in the narrative. This is consistent with Gigerenzer and Goldstein (2011) who posit that specific heuristics may be de-composed into single cognitive operations, each prone to biased thinking.

The present study aims at exploring cognitive heuristics over time based on the study by Keller et al. (2018), and their potential links with the therapeutic alliance in the beginning of treatment for clients with borderline personality disorder (BPD). The change in the therapeutic alliance functions here as indicator of interpersonally adaptive action of the cognitive process of interest. We aim at a generality of the conclusions across therapy approaches, assuming that these cognitive heuristics are processes relevant in any treatment context, including treatments without an explicit focus on these concepts.

Hypotheses

In order to address the above research question, an exploratory approach to the definition of cognitive heuristics will be used, without any guiding hypothesis. Rather, a longitudinal approach will be used to define and characterize in detail the clusters, then the actual study hypothesis will focus on clients' use of these specific cognitive heuristics which is linked with the development of the therapeutic alliance, over the course of initial therapy sessions for borderline personality disorder.

METHODS

Design

The present study is a secondary analysis of a randomized controlled trial which aimed at the study of the therapy relationship construction over the first 10 sessions therapy for BPD (Kramer, Flückiger, Kolly, Caspar, Marquet, Despland et al., 2014; Kramer, Kolly, Berthoud, Keller, Preisig, Caspar et al., 2014). This study compared two conditions: a ten-session standard treatment according to the principles of good psychiatric management (GPM; Gunderson & Links, 2014) and a ten-session treatment with the adjunction of an individualized case formulation aiming at the increase of the therapeutic collaboration according to the principles of Plan Analysis and the motive-oriented therapeutic relationship (MOTR; Caspar, 2007). Out of the $N = 85$ clients randomized, the present study used as sub-sample ($n = 60$) analysed over three time-points in terms of change in cognitive biases (Keller et al., 2018). We selected $n = 60$ clients for the completeness of process data, garanteeing the feasibility of in-session analysis of cognitive biases over three time points. In total, 180 datapoints are re-analyzed in the present study. The original study was approved by the local ethics board.

Participants

In total, $N = 60$ clients with Borderline Personality Disorder (BPD; APA, 2000) were included in the present study. The diagnoses were established using the structured clinical interview for DSM-IV (SCID-II; First, Spitzer, Williams, & Gibbons, 2004; inter-rater reliability was satisfactory; $\kappa = 0.81$). Diagnoses on Axis I were assessed using the MINI (Lecrubier, Sheehan, Weiller, Amorim, Bonora, Sheehank et al., 1997). Inclusion criteria were a diagnosis of BPD according to DSM-IV and be between 18 and 65 years old at the time of recruitment. Exclusion criteria were the presence of a psychotic disorder according to DSM-IV, mental

retardation and substance abuse as the main presenting problem. The mean age of the clients was 33.17 (SD = 9.95; ranging from 20 to 55) and 67 % were female. The mean number of BPD criteria met was 6.68 (SD = 1.43).

Treatments included

A ten-session short version of a psychiatric treatment according to GPM principles (Gunderson & Links, 2014) was used. This brief intervention encompasses the discussion of the clinical diagnosis including co-morbidities, investigate specific problem areas and communicate the conclusions to the client. The motivation to pursue a long-term treatment was assessed and discussed, and short-term objectives were fixed. Problems interfering with a therapy were evaluated. In the MOTR condition, therapists were asked to apply the principles of the case formulation method of Plan Analysis (Caspar, 2007) for their client; they were asked to develop a therapeutic relationship that is complementary to the client's acceptable Plans, on a moment-by-moment-level in each session. The main study demonstrated a high treatment integrity to GPM principles (Kolla, Links, McMain, Streiner, Cardish & Cook, 2009), equally for both conditions ($t(1, 38) = 0.58$, $p = .57$). The study showed also a significant higher score of MOTR (Caspar, Grossmann, Unmüssig, & Schramm, 2005) in the MOTR-condition, compared to the standard condition (t (1, 59) = 10,62, $p = 0.00$; Kramer, Kolly, et al., 2014). We can conclude that treatment integrity was excellent.

Instruments

Working Alliance Index – Short Form (Tracey & Kokotovic, 1989). The French version (Corbière, Bisson, Lauzon, & Ricard, 2006) of this 12-item self-report questionnaire was used to assess client- and therapist-rated alliance. A Likert-type scale ranging from 1 (never) to 7 (always) was used. The questionnaires were completed after each therapy session and total

scores were used for analyses. Internal consistency (Cronbach's alphas) was excellent (α = .90 – .96).

The *Cognitive Errors Rating Scale* (CERS; Drapeau, Perry & Dunkley, 2008) is an observer rating instrument assessing cognitive errors in interviews which are transcribed. Validity coefficients of the French version were reported by Kramer and Drapeau (2011). This observer-rating scale assessed 15 cognitive errors, each broken down per valence, positive or negative. The fifteen errors were: 1) Fortune-telling, 2) Labelling, 3) Over-generalisation, 4) All-or-nothing thinking, 5) Discounting the positive or the negative, 6) Emotional reasoning, 7) Magnification or minimisation of the positive or the negative, 8) Mental filter, 9) Should and must statements, 10) Tunnel vision, 11) Jumping to conclusions, 12) Mind reading, 13) Personalisation, 14) Inappropriate blaming or crediting of self, ignoring the role of others, 15) Inappropriate blaming or crediting of others, ignoring the role of self. Raters are advised to use the manual by Drapeau, Perry and Dunkley (2008) as a basis of their rating. In order to control for the individual's productivity in session, all scores of cognitive errors were transformed into relative frequencies per 1000 words (only client's words included) per session. Inter-rater reliability was calculated on 22 % of the transcripts (39 out of the 180 sessions) and was satisfactory with intra-class correlation coefficients (ICC (2, 1); Shrout & Fleiss, 1979) which varied between .46 and .95 (M= .76; SD= .16). Because the .46 score was the only one below .65, it was accepted as an outlier. In a subsequent re-analysis between two different raters, this particular case presented with a ICC (2, 1) of .67; therefore, this case entered the analyses.

Procedure

All therapy sessions were video or audio taped. Sessions one, five and nine were selected to be coded with the CERS. Three sessions per therapy and in total N = 180 sessions were

selected for the present study. These interviews were transcribed and anonymized (Mergenthaler and Stigler (1997) which served as the basis for the CERS ratings.

Statistical Analyses

Given the increasing interest in detecting subgroups of individuals with similar pattern in their joint trajectories regarding several longitudinal variables, we used a longitudinal non-parametric approach. A recent method is proposed by Genolini, Pingault, Driss, Cote, Tremblay, Vitaro, Arnaud and Falissard, 2013, (Genolini & Falissard, 2010) which is implemented and available in the R (R Core Team, 2018) package kml3d. This method is an iterative procedure, and after choosing the number of clusters subjects are attributed to clusters in a way that the individuals in the same cluster have the most similar joint trajectories in time regarding their corresponding observed longitudinal variables. Over ten quality criteria are provided in the literature and are implemented in the kml3d package and a good clustering scheme should be supported strongly by most of these criteria, if not all, to be reliable. In the present study, we used this clustering method with Euclidean distance, in order to identify potential clusters of individuals with similar joint trajectories in using heuristic strategies during the ten sessions of treatment. We have allowed the number of clusters to vary between two and five, and the number of clustering iterations to reach a maximum of 10 000. This analysis took more than three hours on an ordinary desktop computer (Intel Core i5-3570 CPU 3.30 GHz with 8 Gb of RAM). In order to describe the stable intake features of the cognitive heuristics found, we used analysis of variance and independent sample *t*-tests to compare means of continuous variables (i.e., age at baseline and GAF). To assess the association of categorical variables (i.e., gender and marital status) with the identified clusters, we used the chi-square test of independence and replaced it

with the Fisher Exact Test (FET) whenever the the chi-square test was not reliable, because of low expected frequencies in some cells.

In order to test our hypothesis testing the link between the cognitive heuristics and the session-by-session development of the therapeutic alliance, we used linear mixed effect models. These enable us to assess the between-cluster differences of clients' and therapists' therapeutic alliance over time. In this case a common random intercept was introduced for alliance corresponding to each client to allow introducing multiple measurements per client in the model. For exploratory purposes, we aimed at relating the clusters with the outcome described elsewhere for the present sample (Keller et al., 2018).

RESULTS

Defining cognitive heuristics

Based on the results of all reliability, optimality and quality tests, the solution with two clusters was deemed the most adequate solution. The best bi-cluster solution divided the entire sample into two groups of individuals, consisting of one cluster of 51 individuals and another one of 9 individuals. This solution was robust under varying number of iterations. These solutions were identified as Heuristic 1 (n = 51 individuals characterized) and Heuristic 2 (n = 9 individuals characterized).

Static descriptors of the two cognitive heuristics

When assessing the between-group differerences, per session, for all the defining features entered into the klm3d analysis, that means the 30 cognitive biases for each of the three sessions, the following picture appears. Whereas at the first session, the two groups did not differ on any

of the defining cognitive features, at session 5, and most clearly at session 9, the characterization of the two cognitive heuristics appeared most clearly.

Cluster 1 represented a cognitive strategy characterized by a high frequency of all-or-nothing thinking which served the individual to present a positive image of the Self. We call it "I take it all." (TAKE-ALL). Cluster 2 represented a cognitive strategy involving a more complex pattern. It is characterized by a high frequency of overgeneralizing and personalizing biases which served the individual to present a negative image of onself, along with mind reading and tunnel vision types of thinking which serve the individual to maintain a positive image of the Self and the Other. It can be summarized in the following statement: "I imagine, with my resources, I can trust you, but if things do not work out, I am always the culprit." (TRUST-CULPRIT). It appeared that the first heuristic involved a more solipsic stance on part of the individual, the second a more interpersonally enmeshed (Tables demonstrating these effects may be obtained from the first author upon request).

The two heuristis did not differ on a series of static descriptors, including age, gender, marital status, level of education (number of years of training), employment and medication. The only static descriptor which differed between the two heuristics was Global Assessment of Functioning (GAF; measured at intake of treatment). TRUST-CULPRIT heuristic was associated with slightly lower GAF scores, describing more problems with functioning, than the TAKE-ALL heuristic ($t_{18} = 2.15$, $p = .05$; see Table 1).

Insert Table 1

Cognitive heuristics and session by session ratings of the therapeutic alliance

A linear mixed effect model, adjusted for therapeutic alliance evaluated by the clients at the end of each session, suggested a significant difference between therapeutic alliances as reported by the clients between two clusters (Estimate = 11.52; SE = 5.01; $t(55) = 2.30$, $p = .03$). There was also a significant increase in the therapeutic alliance levels over time, which was the same for individuals in both clusters (Estimate = 0.77; SE = 0.21; $t(351) = 3.61$, $p = .00+$; see Figure 1). An interaction term between the clusters and time did not support the presence of any difference between two clusters in their respective change in time. We fitted the same model on alliance as evaluated by the therapists, and there was no difference between alliances corresponding to individuals belonging to different clusters (Estimate = -0.93; SE = 3.56; $t(56) = -0.26$, $p = .80$). A significant positive main effect was observed for change in time (Estimate = 1.34; SE = 0.16; $t(389) = 8.18$, $p = .00+$; see Figure 2) for both groups, and the interaction term between cluster and time was again insignificant. Taking into account the GAF scores did not modify the results.

Insert Figures 1 and 2

For exploratory purposes, we tested the impact of the longitudinally defined two clusters on outcome measured at the end of the 10-session brief therapy (using the Outcome Questionnaire described in the study by Keller et al., 2018). No link between the clusters and outcome was found.

DISCUSSION

The present exploratory study aimed at describing possible cognitive heuristics as adaptive markers of clients with borderline personality disorder (BPD) undergoing a brief psychiatric treatment. As such, this study was embedded in contemporary conceptions of

cognitive heuristics as second-order cognitive biases which may *benefit* – rather than obstruct – the individual's interpersonal adaptation (Gigerenzer, 2007; Gigerenzer & Brighton, 2011; Gilbert, 1998), and explored extensions to clinical psychology and psychotherapy (Dimaggio et al., 2006). In the present study in the context of treatment, interpersonal adaptation was operationalized as the session-by-session development of the therapeutic alliance, rated by the client and the therapist. As such, we assumed that clients' use of specific cognitive heuristics over time was linked with the development of the therapeutic alliance, over the course of initial therapy sessions for borderline personality disorder.

The results indicated that the hypothesis may partially be accepted and that two second-order cognitive strategies, or heuristics, may be reliably identified. They were coined (1) "I take it all" (TAKE-ALL heuristic) and (2) "I imagine, with my resources, I can trust you, but if things do not work out, I am always the culprit." (TRUST-CULPRIT heuristic). These two cognitive heuristics emerged significantly after session 5 into the treatment.

These heuristics were independent of the clients' intake characteristics, except for the TRUST-CULPRIT heuristic which was associated with lower GAF scores (measuring functioning), as opposed to the TAKE-ALL heuristic. TAKE-ALL heuristic may protect the client, by its focus on the (biased) perception of the Self, and the Other, as particularly strong and omnipotent, and actually may shield the client, to some extent and momentarily, from his/her current problems. But in general, cognitive heuristics may crystalize as complex in-session cognitive processes and remain unaffected by the client's socio-demographic features.

Cognitive heuristics are linked with the therapeutic alliance. The client's perspective of the therapeutic, as it was measured session-by-session over the course of 10 sessions of

psychiatric treatment, was linked the client's preferred cognitive heuristic. The TAKE-ALL heuristic was linked with a positive and steady evolution of the client's rating of the therapeutic alliance, whereas the TRUST-CULPRIT heuristic was linked with the therapeutic alliance on a significantly higher level than the TAKE-ALL heuristic. No links were found for the therapist ratings of the therapeutic alliance, nor between the heuristics and therapeutic outcome after 10 sessions of therapy.

This pattern of results may indicate that an interpersonally enmeshed cognitive heuristic may certainly appear as more complex, but may also bear specific interpersonal resources in clients with BPD undergoing treatment. It may mark interpersonal engagement in therapy and opens the door to work explicitly on the interpersonal enmeshment, the problematic aspects of the biased thinking involved and the possibly negative consequences of these cognitive heuristics. As such, it may represent a somewhat hidden resource, which may be taken into account by the therapist already at the first session in treatment. It may help sharpen the central focus of therapy rather quickly, which may contribute to the increasingly positive assessments of the therapeutic collaboration and bond by the client across therapy, fostering trust in helping contexts.

Whereas this interpretation of the pattern of results is plausible, we must acknowledge that, given the exploratory character of the study, we cannot clearly disentangle the orientation of the effects observed. Thus, alternatively, we may interpret that an initially higher therapeutic alliance in specific client-therapist dyads (as observed by the client) may increase the likelihood that a client with BPD uses a specific interpersonally enmeshed cognitive heuristic, the TRUST-CULPRIT strategy. As such, in the context of a strong bond and collaboration around tasks and goals, the client with BPD may develop idealized images of the therapy and the current therapist,

related with the new experience of a possibly trusting therapeutic relationship. It may activate in the client with BPD the TRUST-CULPRIT heuristic which tends to misattribute to him-/herself possible "failures" in this current therapeutic relationship.

It is interesting to note that the therapist perception of the therapeutic alliance, and its progression over the course of treatment, remained unrelated with the client's cognitive heuristics. Cognitive heuristics may indeed be an elusive and complex phenomenon, a pattern of biased thinking which may appear only after some time, with the first clear characterizations found after session 5 into treatment. Therefore, it is not surprising that the therapist perception of the therapeutic collaboration and bond remain unaffected by these elusive client phenomena. Longer treatments and a more explicit focus on the cognitive heuristics on the level of the therapist's formulation of the case and intervention may be needed in order to find an effect.

The present study is one of the first which has extended a contemporary resource-oriented conception of cognitive heuristics as sets of biased thinking to the field of clinical psychology and psychotherapy, in particular on a sample with clients presenting with borderline personality disorder undergoing treatment. It suggests that less may be more also in therapy: the individual's shortcuts and biased thinking may have specific negative consequences, but may also, to a certain extent, benefit the therapeutic collaboration, interpersonal adaptation and building of trust. We would like to speculate that these effects were only assessable, because the present study actually focused on the client's spontaneous in-session speech, as was outlined by Gigerenzer and Brighton (2011; Dimaggio et al., 2006). Such a detailed process analysis of narrative seems necessary to unveil hidden resources in the narrative of highly disturbed individuals.

The current study has several limitations, in particular its exploratory character and the rather small sample size. Bidirectional influences between the evolution of cognitive heuristics and the evolution of the therapeutic alliance may be interpreted in both ways, the current design did not allow to disentangle directionality of the effects found. We have to acknowledge the possible existence (which was not tested in the current study) of a one-cluster solution. Such a solution may be empirically viable, but theoretically and clinically insufficient.

In conclusion, cognitive heuristics may be a useful concept not only for general and cognitive psychology, but also for clinical psychology and psychotherapy research. Second-order cognitive processes may be reliably assessed, based on a word-by-word analysis of text, across three sessions of treatment. Two specific cognitive heuristics may be differentiated (TAKE-ALL and TRUST-CULPRIT) which may have informed the therapeutic process in terms of specific resources and may bear clinical utility in the context of understanding Borderline Personality Disorder. The TRUST-CULPRIT cognitive heuristic is linked with a higher level of client rated therapeutic alliance over time; no effect was found for therapist rated therapeutic alliance nor for the link with outcome. An interpersonal focus may be achieved immediately in those clients coming into therapy which use a pattern of biased thinking with are marked by interpersonal enmeshment.

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