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Change in Cognitive Errors and Coping over the Course of Brief Psychodynamic Intervention

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Running Head: Cognitive Change In Brief Psychodynamic Intervention

Change in Cognitive Errors and Coping Patterns over the Course of Brief Psychodynamic
Intervention

Abstract

Objective: Cognitive change over the course of psychodynamic psychotherapy has been postulated by several models, but has rarely been studied so far. Within the framework of the adaptive skills model (Badgio et al., 1999), we assume change in coping patterns and cognitive errors (also known as cognitive distortions) over the course of very brief dynamic psychotherapy.

Method: A total of $N = 50$ outpatients presenting with various psychiatric disorders undergoing Brief Psychodynamic Intervention (BPI; Despland et al., 2005; 2010) were included in this naturalistic study (Mean age: 31 years; 56% female; all Caucasian). BPI encompasses four sessions of psychodynamic intervention. Cognitive errors and coping strategies were assessed using the reliable observer-rated methods of the Cognitive Errors Rating Scale (Drapeau et al., 2008) and Coping Action Patterns Rating Scale (Perry et al., 2005); all four therapy sessions for each patient were rated using verbatim transcripts.

Results: Results indicate change in both cognitive errors and coping patterns over the course of BPI, in particular an increase in the Overall Coping Functioning and a decrease in unhelpful coping processes, such as isolation, reflecting an “appraisal shift” towards stress appraised as a challenge at the end of treatment. These changes predicted symptom change at the end of treatment. Cognitive errors changed systematically over the course of BPI; no predictive effect was found with regard to symptom change.

Conclusions: These results are interpreted within the framework of common change principles in psychotherapy and further research perspectives are put forward.

Key-Words: Cognitive Errors; Coping Patterns; Brief Psychodynamic Intervention; Hierarchical Linear Modeling; Observer-Rated Methodology

CHANGE IN COGNITIVE ERRORS AND COPING PATTERNS OVER THE COURSE
OF BRIEF PSYCHODYNAMIC INTERVENTION

Introduction

The impact of cognitions on patient change over the course of psychotherapy is an important issue for several therapeutic modalities, and not only for cognitive therapy that focuses explicitly on change in cognitive variables. Two concepts are at the core of cognitive-behavioral treatments: (1) cognitive errors (or distortions, or biases; Beck, 1963, 1995) which may be defined as errors in appreciation and interpretation to be found in the patient's thinking and narrative, such as making an over-generalizing comment based on a single fact; and (2) coping skills. The latter processes may be defined as "overt and covert behaviors that are taken to reduce or eliminate psychological distress or stressful conditions" (Fleishman, 1984, p. 229). Therefore, these processes aim at maintaining the homeostasis of the patient's system. As discussed by Barber and DeRubeis (1989), according to the accommodation model, change in cognitive errors was found in cognitive therapy for depression which is known to be a clinical condition associated with over-generalizing cognitions. This change can be described as the acquisition by the patient of an alternative – more adaptive and objective - view of the world (Clark, Beck, & Alford, 1999). For the case of cognitive therapy of personality disorders which are known to be associated with dichotomous thinking, the patient changes towards the acquisition of a thinking along a continuum, implying a nuanced fashion of apprehending the world (Beck, Freeman and Associates, 1990). Change in coping skills was reported in several forms of behavior-based interventions, such as exposure-based systematic desensitization implying the acquisition of coping skills related to problem-solving and communication (Goldfried, 1980), dialectical-behavior therapy implying the acquisition of coping skills related to emotional control, re-appraisal and cognitive distancing (Neacsiu,

Rizvi, Vitaliano, Lynch, & Linehan, 2010), as well as in cognitive therapy for depression (Barber & DeRubeis, 2001; Persons, 1993).

Cognitive change across psychotherapy is expected to be found in other forms of therapy. For example, the development of “adaptive skills” (Badgio, Halperin, & Barber, 1999) may be understood as an over-arching treatment objective particularly relevant in short-term psychodynamic psychotherapy. Adaptive skills in the context of psychodynamic psychotherapy may be defined as “the facilitation of increased patient ability to function more adaptively through increased awareness and understanding of his/her behavior, thought and emotional processes” (Badgio et al., 1999, p. 724). This objective implies the development, over the course of therapy, of an “observing ego”. The latter acts as psychological distancing function from intra-psychic and interpersonal processes, such as defense mechanisms, affects, conflicts and interpersonal patterns. Whilst using psychodynamic techniques (*i.e.*, insight-enhancing techniques, interpretations) that differ greatly from those used in cognitive-behavioral therapy, a very similar level of change may be observed in patients undergoing psychodynamic psychotherapy: change related to cognitive variables (Badgio et al., 1999). The implications of the adaptive skills model are consistent with Cramer’s (1998) conclusions on the comparison between the psychodynamic concept of defense mechanisms and the concept of coping (see the discussions by Kramer, 2010a/b). The latter constructs may be understood as somewhat differing operationalizations of the adaptive skills construct. Furthermore, there is some overlap between the concept of observing ego (Badgio et al., 1999) and of reflective functioning (Fonagy, 1991) which implies cognitive capacities of self-observation in an objective and critical way, hence the individual should present with low levels of biased perceptual and interpretative activity; reflective functioning capacities were related to therapeutic outcome in psychodynamic psychotherapy of the Borderline patient (Clarkin, Levy, Lenzenberger, & Kernberg, 2007). Finally, from an experiential perspective,

the notion of experiencing implies an affective component, but also a cognitive aspect of meaning-making out of the affective arousal experienced and identified within the subject's body (Pascual-Leone & Greenberg, 2007). According to a recent study (Lewandowski et al., 2011), cognitive errors play a central role in the quality of in-session experiencing and the degree of experiential in-session avoidance. Experiencing is known to be a key-variable in several forms of psychotherapy in that it predicts outcome (Castonguay et al., 1996; Pos et al., 2001), on which the levels of cognitive errors may have an impact. This brief overview shows the theoretical and empirical relevance of the concepts of cognitive errors and coping across different psychotherapy forms. Even if there is some consensus on a general level, very few empirical data exist on the relevance of these concepts in psychodynamic psychotherapy. The present article aims at understanding cognitive changes over the course of psychodynamic psychotherapy.

Empirical evidence on cognitive change in psychodynamic psychotherapy

What do we know so far about change in cognitive variables, *i.e.*, cognitive errors and coping, over the course of psychodynamic treatments? The data are somewhat contradictory. In a study based on a pooled database with a total *N* of 411 patients presenting with various psychiatric disorders, Connolly Gibbons et al. (2009) showed that change in compensatory or coping skills over the course of both psychodynamic and cognitive therapy predicted symptom decrease over treatment. Similar results were reported for the variable view of the self. However, as hypothesized, change in self-understanding was specific to dynamic psychotherapy. This first study on cognitive change in psychodynamic psychotherapy underlines the importance of the issue, but, as stressed by the authors, suffers from its sole reliance on self-report measures, along with some other shortcomings (*i.e.*, high attrition and the pooled sampling procedure). Using an observer-rated methodology to address this criticism, Kramer et al. (2009) showed in a naturalistic study focusing on early change in

Short-Term Dynamic Psychotherapy for patients presenting with adjustment disorder ($N = 32$) that, overall, no change in coping skills was found over the initial 12 sessions of psychodynamic therapy. Only if the therapeutic alliance was introduced into the model, the authors found an interaction effect: the better the therapeutic alliance over time, the better the coping over the initial sessions. Kramer and colleagues (2010) showed in a recent study on the entire psychotherapy (the same sample as above) that there was neither any change of the coping variable over the course of efficient 40-session psychodynamic psychotherapy nor any effect in terms of the linkage with therapeutic outcome. Using the same methodology, Perry and colleagues (2009) showed a large effect in coping functioning in a single case of a severely depressed outpatient over the course of psychodynamic psychotherapy. Kramer and colleagues (2010) hypothesized that the severity of symptomatology functions as a moderator of cognitive change; that said, cognitive change in effective psychodynamic treatments may be reserved for more disturbed individuals.

Several limitations of the afore-mentioned studies should be discussed. Even if the three latter studies used a valid and reliable observer-based methodology, they did not assess all treatment sessions and, thus, were not able to exclude fluctuations due to environmental influences or to chance. According to Badgio et al. (1999), an ultra-brief psychodynamic intervention format - such as the Brief Psychodynamic Intervention (BPI; Despland, Drapeau, & de Roten, 2005) - enabling the session-by-session assessment, may therefore be a promising and feasible perspective, albeit we need to be cautious about the expected cognitive change over such small number of sessions. Moreover, the previous studies had power problems which were compensated by the reduction of the number of variables using only the general score of coping. Greater power would have enabled the authors to explore coping and cognitive errors on the level of specific categories. Finally, no study using an observer-rated

methodology assessing change in cognitive errors in psychodynamic psychotherapy has been conducted so far.

These considerations lead us to three hypotheses: (1) We postulated session-by-session change in specific coping categories over the course of Brief Psychodynamic Intervention (BPI). (2) We assumed session-by-session change in overall frequencies of cognitive errors and specific cognitive error categories over the course of BPI. (3) Finally, we predicted that these changes are linked with the therapeutic outcome.

Method

Participants

Patients

In total, $N = 50$ French-speaking outpatients presenting with various psychiatric disorders participated in the study. Their mean age was 30.54 years ($SD = 9.41$, range between 17 and 57 years), $n = 28$ patients (56%) were female; all patients were Caucasian. The patients presented with, on axis I of DSM-IV, mood disorders (65.3%), anxiety disorders (37.4%), eating disorders (4.2%), sexual disorders (4.2%) and substance-abuse related disorders (3.1%), and on axis II of DSM-IV 38% of Cluster C personality disorders. More details on the sample can be found in a previous publication focusing on outcome (Despland et al., 2005). All diagnoses were established by trained clinicians using the Semi-Structured Clinical Interviews for DSM-IV (SCID-I and II; First et al., 2004; APA, 1994). Reliability coefficients of the diagnoses were acceptable (Despland et al., 2005); mean kappas were considered substantial (axis I: $\kappa = .65$; axis II: $\kappa = .54$). Their mean Global Severity Index was .97 ($SD = .49$; range .45 – 2.13). Therefore, this sample represents an accurate representation of the global clientele the given unit treats (Despland et al., 2005). Clearance by Internal Review Board (Ethic Committee) was obtained beforehand.

Therapists

In total, $N = 10$ psychotherapists participated in the study, 3 (33%) were female, all were Caucasian; 9 were psychiatrists, 1 was a psychologist. Their clinical experience encompassed basic psychiatric training, training in psychodynamic psychotherapy, a mean of 19 years of practice in that form of therapy, as well as specific post-training in Brief Psychodynamic Intervention (Despland et al., 2010; Gilliéron, 2004). The latter involved two years of weekly case supervision and regular training classes equivalent to 80 hours. Their reported level of adherence to the manual and therapist competence (Despland et al., 2009) was considered sufficient, global adherence to the manual was on average 3.8 (SD = 0.7) on the scale ranging between 1 and 5 (Despland et al., 2009).

Raters

In total, $N = 15$ raters participated in the study; 11 (73%) were female, all were Caucasian and their mean age was 28.13 (SD = 3.54). They received formal training in the rating scales employed; their end reliability after six months of training on 13 cases prior to the use of the rater for the present study was excellent (Kramer, de Roten, & Drapeau, 2011), with an overall mean ICC (2, 1) over all categories and raters of .77 (SD = .08; range between .61 and .88).

Treatment

Brief Psychodynamic Intervention (BPI; Despland, Michel, & de Roten, 2010; Gilliéron, 2004) is a four-session outpatient ultra-brief intervention based on psychodynamic principles (Sifneos, 1987). These interventions involve the interpretation of core relationship themes, defensive functioning and on the providing of a synthesis relating interpersonal characteristics to the presenting problem. In that, it has close familiarity with what, in the research context, Perry, Fowler and Semeniuk (2005) have called the dynamic interview. BPI has been empirically investigated and has shown sufficient effectiveness (Despland, Drapeau,

& de Roten, 2005); 32% of the patients present with clinical significant improvement on the Global Severity Index over the four sessions.

Instruments

Coping Action Patterns Rating Scale (CAPRS; Perry et al., 2005; French translation by Kramer & Drapeau, 2011). The CAPRS is an observer-rating system assessing coping processes based on interview-transcripts. The rating scale encompasses 12 categories of coping (based on the comprehensive review by Skinner, Edge, Altman, & Sherwood, 2003). Three general domains are identified (relatedness, competence, autonomy) in the measure, encompassing each four “families” of coping. Furthermore, according to Lazarus and Folkman’s (1984) distinction, six of the coping categories are conceived as coping with stress appraised as challenge (problem-solving, information-seeking, self-reliance, support-seeking, accommodation, negotiation) and the other six as coping with stress appraised as threat (helplessness, escape, delegation, isolation, submission, opposition). Each coping category may be broken down into three levels (affective, behavioral and cognitive). Therefore, a total of 36 coping processes are assessed by this instrument. For our study, we only used the 12 categories enumerated, in order to avoid to lose power. Relative frequencies are computed for all coping processes. Based on Skinner et al. (2003), an Overall Coping Functioning (OCF) score can be computed (meaning the relative frequency of challenge-coping). Empirical validation has been presented by D’Iuso, Blake, Fitzpatrick and Drapeau (2009) and by Lewandowski et al. (in press) for the original English version and by Kramer and Drapeau (2011), Kramer, de Roten, & Drapeau (2011), Kramer and Drapeau (2009), Kramer, Drapeau, Khazaal and Bodenmann (2009) for the French version used for this study. For the current study, reliability coefficients on 24% (46) of the transcripts were established among trained raters and yielded satisfactory coefficients with ICC (2, 1) varying between .65 and .94 (M =

.81; SD = .09). The unit of analysis for these coefficients was on the level of the 12 coping categories.

Cognitive Errors Rating System (CERS; Drapeau, Perry, & Dunkley, 2008; French translation by Kramer, & Drapeau, 2011) is an observer-rating system assessing cognitive errors in interview transcripts. It assesses 15 different cognitive errors (J. Beck, 1995, A. T. Beck, 1963): (1) Fortune-telling, (2) Labeling, (3) Over-generalizing, (4) All-or-nothing, (5) Discounting the positive/negative, (6) Emotional reasoning, (7) Magnification/minimization of positive/negative information, (8) Mental filter, (9) Should and must, (10) Tunnel vision, (11) Jumping to conclusions, (12) Mind-reading, (13) Personalization, (14) Inappropriate blaming of oneself, and (15) Inappropriate blaming of others. All errors are broken down according to their valence: positive and negative, yielding a total of 30 categories for the entire scale. According to Lefebvre (1981), they can be classified in four higher-order categories: fortune-telling (error 1); over-generalizing (errors 2 and 3); selective abstraction (errors 4 through 11); personalization (errors 12 through 15). For all computations, absolute frequencies are used, by weighting each error by the number of words emitted by the patient (excluding therapist interventions and patient hesitations) yielding a score per 1000 words. Empirical validation data have been presented in several studies, accounting for sufficient internal and external validity (see D'Iuso, Blake, Fitzpatrick, & Drapeau, 2009; Lewandowski, D'Iuso, Blake, Fitzpatrick, & Drapeau, 2011) for the original English version and Kramer and Drapeau (2011), Kramer, Bodenmann and Drapeau (2009), Kramer, de Roten, and Drapeau (2011), Kramer and Drapeau (2009) for the French version used for this study. For the current study, reliability coefficients on 24% (46) of the transcripts were established between pairs of trained raters and between trained raters and the supervisor and yielded satisfactory results with ICC (2, 1) varying between .60 and .96 (M = .75; SD = .10).

These coefficients were established along the four categories of errors according to Lefebvre (1981) and broken down into positive and negative valence as unit of analysis (8 categories).

Symptom Check-List-90-R (SCL-90-R; Derogatis, 1994). This questionnaire includes 90 items measuring various psychological and somatic signs of distress; these items are scored using a Likert-type scale ranging from 0 (“not at all”) to 4 (“very much”). The present study only used the Global Severity Index (GSI, score ranging between 0 and 4), which assesses mean overall symptoms. The clinical cut-off score is 0.80. The French validation study was carried out by Pariente and Guelfi (1990) and yielded satisfactory coefficients. For the present sample, Cronbach’s alpha was .89 and the GSI at intake was on average .97 (SD = .49; range between .02 and 2.04); thus, the mean score is in the clinical range. In order to compute symptomatic change over the course of the four sessions of BPI, the Reliable Clinical Change Index was applied to the GSI scores (Jacobson & Truax, 1991). The results indicate that 32% ($n = 16$ cases) improved significantly, 62% ($n = 31$ cases) remained unchanged and 6% ($n = 3$ cases) deteriorated. Controlling for symptom level at intake, therapeutic outcome was operationalized as residual gains on the GSI score. Negative numbers indicate improvement.

Procedure

The questionnaire (SCL-90-R) were given to the patients at the end of the intake session (session 1) and discharge session (session 4). All treatment sessions were tape-recorded and transcribed according to the rules by Mergenthaler and Stigler (1997). Ratings were done based on the transcripts. The session number was blinded for all raters.

Data Analytic Strategy

In preliminary analyses, a word-count was performed using the Works program for all sessions (excluding patient hesitations and therapist interventions; see above under Instruments), in order to be able to weight the absolute frequency per cognitive error by the

number of words emitted (per 1000). In order to test relative independency between the CERS and CAPRS, we performed preliminary canonical correlations between the two sets of variables (CEs and CPs; only intake session). This set of correlations was based on a multivariate model and a linear combination method which maximize the possible links between the set of variables and control best for type I error related to multiple significance testing (Tabachnick & Fidell, 1996).

In order to test the first hypothesis, we used Hierarchical Linear Modelling on all four sessions over time (Bryk & Raudenbush, 1987), based on a nested design assuming linear change over time for CAPs (linear base model). We used Hierarchical Linear Modeling to deal optimally with data dependency between the first, second, third and fourth session. In assessing cognitive change, HLM avoids the limiting assumptions of exploratory repeated measures MANOVA by taking into account each individual's trajectory of scores over time, while at the same time enabling averaging the results in the usual group statistics format. HLM also optimally deals with missing values. Sessions (change across time) are modeled on level 1 ($Coping_{ij} = \beta_{0i} + \beta_{1i}(session_{ij}) + \varepsilon_{ij}$) and patients (between-person change) on level 2 (Intercept: $\beta_{0i} = \gamma_{00} + \mu_{0i}$; Slope: $\beta_{1i} = \gamma_{10} + \mu_{1i}$). We applied this model to the Overall Coping Functioning (OCF) score, as well as to the 12 coping categories. In addition, we tested the quadratic model of change in these variables, by adding a quadratic term to the equation. In order to test the second hypothesis, a similar analysis was performed for the global scores and specific categories of CE (same formula as above; quadratic term was added in a second step). For all comparisons, effect sizes (Cohen's d) were computed using data from intake (1st) and discharge (4th) sessions and Bonferroni's corrections were applied. Finally, in order to test the third hypothesis, we introduced the outcome on level 2 of the HLM model, on four variables separately, *i.e.*, Overall Coping Functioning, total of CEs, as well as total of positive and negative CEs.

Results

Preliminary analyses

The canonical correlations between CEs and CAPs yielded an overall score of $r = .22$ which is non-significant. The total error score correlated with OCF on $r = .02$ (ns; Pearson's correlation). More specifically, there were some significant inter-scale correlations: Positive CE correlated positively with information-seeking ($r = .53$ for over-generalizing, $.45$ for selective abstraction and $.85$ for personalizing), escape ($r = .46$ for selective abstraction), negotiation ($r = .65$ for over-generalizing and $.39$ for selective abstraction), accommodation ($r = .55$ for personalizing) and opposition ($r = .50$ for selective abstraction and $.43$ for personalizing). Negative CE correlated positively with two coping processes where the stress is appraised as a threat (opposition: $r = .75$ for over-generalizing and $.50$ for selective abstraction, and helplessness: $r = .50$ for fortune-telling and $.43$ for personalizing), positively with information-seeking where the stress is appraised as a challenge ($r = .52$ for over-generalizing and $.78$ for selective abstraction) and negatively with problem-solving where the stress is appraised as challenge ($r = -.53$ for personalizing). These results support the assumption that CE and CAP are two distinct process characteristics of the patient's in-session discourse, with some limited, very specific, overlap.

The word count yielded the following: for the intake session, the patients emitted on average 5366 words ($SD = 1900$), for the discharge session 4874 words ($SD = 1659$) which is marginally significant in a Paired-Sample t -test ($t(1, 46) = 2.00$; $p = .05$). Thus, systematic controlling for number of words emitted was relevant.

Due to technical problems related to the recording, the total sessions analyzed was $N = 189$ (11 missing out of the 200). The maximum number of sessions missing per patient is 1.

Change in Coping Patterns over the course of Brief Psychodynamic Intervention

Over the course of Brief Psychodynamic Intervention (BPI), Overall Coping Functioning (OCF) increased from .43 at session 1 to .63 at session 4, which resulted in a significant slope (see Table 1). On the level of the specific categories, two categories where the stress is appraised as a challenge increased (information-seeking and isolation), whereas one category where the stress is appraised as a threat decreased (isolation). No other categories were found to change over the course of BPI. Findings consistent with the linear slope model were found when using the quadratic model; thus, only the linear model was kept.

Change in cognitive errors over the course of Brief Psychodynamic Intervention

Over the course of BPI, the total number of cognitive errors decreased from 85.14 to 46.37 per 1000 words, which is significant (see Table 2). Both positive and negative cognitive errors decreased over the course of BPI, in particular over-generalizing and selective abstraction for both valences. No effect was found for the remaining specific categories. Findings consistent with the linear slope model were found when using the quadratic model; thus, only the linear model is reported.

Predicting therapeutic outcome by change in cognitive variables

Finally, we examined a HLM model predicting therapeutic outcome by the change in cognitive variables, by adding outcome as predictor on level 2 of the HLM equations. The results showed that the increase of Overall Coping Functioning predicted the outcome ($T(1, 48) = -2.10; p = .04, d = 0.36$), whereas the decrease in the total number of cognitive errors was not significant ($T(1, 48) = 1.49; p = .14; d = 0.29$). On the level of the CE valence, we did not find any effect for negative cognitive errors ($T(1, 48) = 0.95; p = .35; d = 0.10$), but the opposite is true for the decrease in positive cognitive errors over the course of BPI which predicted therapeutic outcome ($T(1, 48) = 2.16; p = .03; d = 0.38$).

Discussion

The results indicate that overall cognitive change is produced over the course of very brief psychodynamic psychotherapy, even if the 4-session brief treatment produces not more than 32% of significant improvement on the symptom level (Despland et al., 2005). In light of the latter result, we need to be cautious about expecting much cognitive change over such a short period of time; therefore, our results reach high levels of clinical significance.

Cognitive change, not aimed at *per se* in these interventions, may result as a by-product of psychodynamic interventions. In particular, more adaptive coping skills, or coping patterns where the stress is appraised as a challenge (*i.e.*, information-seeking and accommodation) increased over the course of BPI, whereas isolation, a specific coping category which may put the individual at risk on the developmental level (Skinner et al., 2003) decreased over the course of BPI. Information-seeking was previously related with the patient's involvement in therapy (Lewandowski et al., 2011), a variable discussed to be close to the experiencing concept which, in turn, predicted outcome across psychotherapy approaches (Castonguay et al., 1996). Moreover, these specific changes are underlined by the overall change in coping adaptiveness: OCF changed towards more adaptation over the course of BPI. These results contrast with earlier studies on psychodynamic treatments which reported no overall coping changes over the course of Short-Term Dynamic Psychotherapy (Kramer et al., 2009, 2010), but are consistent with the results of the questionnaire-study by Connolly Gibbons et al. (2009). How can we understand the specific effect of BPI on coping adaptiveness, at the light of coping skills stability over the course of longer psychodynamic therapies? We may argue using Badgio et al.'s (1999) adaptive skills concept. According to this model, adaptive skills may be understood as an over-arching treatment objective which are relevant for several therapy models, and the capacity to implement adaptive skills should therefore increase as a result of psychodynamic intervention, in particular when these

interventions are brief. Indeed, very brief interventions, such as BPI, tend to produce very quickly psychological change on various levels, such as symptomatic (Despland et al., 2005), and defensive functioning (Drapeau et al., 2003), an early change possibly lost in the variance related to longer treatments. According to Drapeau et al. (2003), BPI as a form of crisis intervention produces change in defensive functioning encompassing a defensive “shift” over the course of BPI from narcissistic towards obsessional defenses. Thus, after crisis resolution (at the end of the four-session treatment), the patients present with less narcissistic defenses, but more intellectualizing defensive activity. Similarly, our results on coping patterns suggest an “appraisal shift” from stress appraised as a threat towards stress appraised as a challenge at the end of the four-session treatment towards higher levels of adaptiveness. These changes are considered to take place on the “surface” of the individual’s psychic functioning; they may represent state changes, *i.e.*, like a return to the baseline before crisis that lead them to seek help; alternatively, they may be due to a honeymoon effect, *i.e.*, an overly positive view of the therapy and the therapist leading to some initial relief, or, finally, these changes may represent a real learning effect. Disentangling these early processes was not possible in the current study and would necessitate a controlled design. We hypothesize that for more profound restructuring, either in terms of personality and defensive organization or of schema aspects – associated with higher levels of symptom relief -, more sessions may be necessary. It is noteworthy to underline that these effects on process variables are present, despite less convincing data regarding the response on a symptomatic level (only 32% of the patients significantly improved on the symptom dimension); thus, appraisal shift as specific cognitive change may be produced even before symptomatic change. Alternately, the effects observed by the present study and by Drapeau et al. (2003) may also be confounded with the effects related to (very) early responders. Our design, implying systematic symptom measures only at pre- and post, did not allow to test these assumptions.

As postulated, distorted thinking decreased over the course of psychodynamic intervention. Both positive and negative cognitive errors were reduced as a by-product of BPI. In particular, over-generalizing and selective abstraction were less frequent towards the end of treatment, compared to intake. It may be hypothesized, in line with Beck (1995) and Clark et al. (1999) that short-term treatments generally produces a more nuanced and adaptive view of the world, the self and the future, characterized by a more “objective” cognitive construction of reality. In that sense, the results of the present study are consistent with Connolly Gibbons et al.’s (2009) observation of change in views of oneself over the course of dynamic psychotherapy. More specifically, according to Kendall and Hollon (1981), change in positive cognitive errors is a long-term process, whereas change in negative cognitive errors tends to result quite quickly from cognitive psychotherapy. Our effect of change in positive cognitive errors over BPI challenges this position, even if we used a different approach than in Kendall and Hollon’s study. The present methodology relying on in-session discourse might be particularly suitable to detect session-by-session decreases of cognitive errors in the patient’s narrative.

It is noteworthy that only the decrease in positive cognitive errors predicted therapeutic outcome, which was not the case for the negative ones. Positive cognitive errors may be underpinned by defensive processes such as denial (Kramer & Drapeau, 2009), along with others like reaction formation, idealization, omnipotence, rationalization or splitting, which tend to produce positive affects as short-term consequences, but, as a distortion in thinking, may still put at risk the individual’s psychological development over time. Alternately, the presence at session four of rather high levels of cognitive errors, along with rather high levels of maladaptive coping, might be interpreted within the model of adaptive heuristics as complex decisional strategies infused by affect (Gigerenzer & Brighton, 2011; Kramer, Caspar, & Drapeau, submitted) implying that under certain circumstances, the

presence of cognitive errors supports adaptation. A recent empirical example using the same methodology as in the present study was put forward by Kramer, Vaudroz, Ruggeri and Drapeau (in press) hypothesizing that some degree of distorted thinking in patients presenting borderline personality disorder might be useful to the adaptation to reality of these patients. The absence of link between the decrease of negative cognitive errors and the symptomatic change in the present sample might be due to the presence of adaptive heuristics, which means that to some extent, the negative cognitive errors might contribute to adaptation. Alternately, the absence of relationship between the decrease in cognitive errors and outcome might indicate that these processes are in fact epiphenomena or "surface" characteristics of psychic functioning which in itself drives mood. It might hint to the conclusion that the therapeutic focus on negative cognitive errors might prove less efficacious than the focus on the direct change in positive cognitive errors. More research along this line may help to answer this question.

Several research perspectives result from the present study. Firstly, our design being an exploratory naturalistic study, we can affirm high levels of external validity. In this sense, the conclusions are consistent with practice-based evidence research (Barkham & Margison, 2007), in particular based on the representativeness of the sample for the larger population treated at the particular clinical unit where the study took place. Thus, further studies may be conducted on the change of cognitive variables in Brief Psychodynamic Intervention (BPI), taking the present results as first exploration. From a clinical health service perspective, the present results might help to guide clinical decisions and thus function as benchmarks of cognitive process change over a short period of time, with which future treatment evolutions in BPI can be compared. Furthermore, cognitive change has been investigated in short-term dynamic psychotherapy, but only in one case of long-term dynamic psychotherapy (Perry et al. 2009), which should be pursued further. Between-approach comparison of change in

cognitive processes using a process-based assessment procedure, within the context of a randomized trial, may show specificities of these changes as function of treatment approach. In line with the model by Badgio et al. (1999), we may also assume change in adaptive skills an over-arching mediator of change, in particular in very short-term therapies. Statistical mediator analysis would help in testing the latter assumption. Finally, the line of research on adaptive heuristics should be pursued further using the above methodology, aiming at a more thorough and differentiated understanding of the adaptiveness of cognitive processes, as they occur sequentially in session.

We need to acknowledge several limitations of the present study. Neither control group, nor a randomized design was used in order to adequately compare these findings with patients without treatment while increasing internal validity; thus, effects due to spontaneous remission may be confounded with the effects found. This limitation also prevented us from conducting a full mediator analysis on cognitive change as statistical mediator in psychodynamic psychotherapy (Johansson & Hoglend, 2007). We are facing possible confounding variables, in particular related to the patient heterogeneity, the therapist variability and, possibly, some rater variability. These limitations are typical for naturalistic trials, such as the one we have conducted, whereas external validity in our trial is high. As stated above, the patients represent the population the clinical unit deals with; therefore, the results on change on cognitive errors and coping patterns might help guiding clinical decision-making in the future. On grounds of just-above threshold power, we were unable to address the question whether some patients changed in a different way as suggested by the group testing of cognitive change. Ideally, patient's pre-treatment characteristics need to be taken into account for the sampling procedure of a study (Krause, Lutz, Boehnke, 2011), which was not possible in present trial. We cannot rule out other confounding variables, such as therapeutic alliance or personality explaining the change on symptom or cognitive variables,

or, alternately, the assumption that the change in cognitive variables explains the symptom change; session-by-session control for symptom change would have helped to rule out some of the alternative explanations, which was not done in the present study. Changes on the micro-process-level, *i.e.*, in-session sequential changes of coping and cognitive errors, were not investigated in this study which is a research strategy consistent with the adaptive heuristics conception described earlier, as the unit of analysis was the session, thus fluctuations within one session may have been overlooked.

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Table 1

Mean and SD of Coping Action Patterns (CAPs) over the four sessions of Brief Psychodynamic Intervention, with HLM slope coefficients over time

CAP	Session 1	Session 2	Session 3	Session 4	Est	SE	<i>T</i>	ES
OCF	.43(.17)	.43(.22)	.45(.20)	.63(.22)	0.07	0.01	4.84**	1.02
P-solving	1.23(3.07)	3.15(7.31)	2.06(5.05)	2.08(4.22)	0.18	0.27	0.67	0.23
Info-seeking	8.46(7.99)	10.63(9.22)	11.08(12.62)	18.46(16.11)	3.10	0.79	3.92**	0.79
Helplessness	15.20(11.91)	11.32(12.26)	12.06(10.95)	12.06(10.95)	-1.15	0.69	-1.67	0.27
Escape	15.94(12.17)	16.70(12.45)	18.01(14.65)	10.04(14.40)	-1.60	0.94	-1.70	0.44
Self-reliance	13.59(10.11)	13.90(15.04)	14.70(12.38)	16.79(17.89)	1.13	0.91	1.23	0.22
S-seeking	14.32(10.68)	8.73(11.24)	7.91(10.74)	13.77(11.78)	-0.34	0.72	-0.47	0.05
Delegation	3.59(5.37)	3.18(5.54)	3.89(5.60)	3.94(7.76)	0.12	0.43	0.27	0.05
Isolation	7.61(8.90)	7.58(8.24)	5.66(7.57)	3.02(6.34)	-1.56	0.43	-3.65**	0.59
Accomod	2.59(4.70)	4.05(6.25)	6.69(9.47)	9.87(11.77)	2.62	.65	4.01**	0.81
Negotiation	2.61(5.21)	2.06(3.50)	2.33(4.77)	2.29(4.70)	-0.09	0.30	-0.29	0.65
Submission	5.43(6.71)	7.25(10.79)	5.60(8.22)	5.35(10.37)	-0.50	0.56	-0.89	0.01
Opposition	9.42(10.67)	11.45(15.80)	10.00(10.48)	7.03(10.38)	-0.84	0.52	-1.61	0.23

Note. Est: Estimate; SE: Standard Error; ES: Effect size (Cohen's *d*); OCF: Overall Coping

Functioning: relative frequency of challenge-coping (problem-solving, information-seeking, self-reliance, support-seeking, accommodatioin, negotiation)

P-solving: Problem-Solving; Info-seeking: Information-seeking; S-seeking: Support-seeking;

Accomod: Accomodation

* $p < .05$; ** $p < .01$; Bonferroni's correction applied: 05/12; 01/12

Table 2

Mean and SD of Cognitive Errors (CEs) over the four sessions of Brief Psychodynamic Intervention, with HLM slope coefficients over time

CE	Session 1	Session 2	Session 3	Session 4	Est	SE	<i>T</i>	ES
Total CE	85.14(74.12)	68.26(51.64)	72.99(69.59)	46.37(43.80)	-1.93	2.98	-4.00**	0.64
CE Positive	22.30(23.61)	18.19(18.09)	19.57(29.82)	12.16(16.35)	-3.05	1.03	-2.97**	0.50
F-Telling	0.62(2.80)	0.71(2.10)	1.18(2.53)	0.72(1.84)	0.08	0.17	0.50	0.04
O-Generaliz	2.89(5.28)	3.06(5.36)	2.44(4.88)	1.39(3.66)	-0.53	0.27	-1.97*	0.33
S-Abstract	18.60(20.00)	14.09(14.93)	14.94(15.89)	9.10(11.11)	-2.90	0.90	-3.23**	0.59
Personaliz	0.20(1.42)	0.33(1.31)	1.01(3.50)	0.94(3.83)	0.27	0.15	1.84	0.26
CE Negative	60.16(56.99)	50.07(40.62)	53.42(51.84)	34.21(34.33)	-7.99	2.34	-3.42**	0.55
F-Telling	4.54(7.72)	3.92(6.50)	4.80(7.20)	3.60(6.05)	-0.26	0.35	-0.76	0.14
O-Generaliz	18.80(24.38)	14.77(17.73)	16.19(18.72)	10.87(13.14)	-2.43	1.04	-2.33*	0.40
S-Abstract	31.30(30.80)	26.39(23.99)	26.89(27.66)	16.63(19.00)	-4.54	1.36	-3.33**	0.58
Personaliz	5.52(7.09)	5.00(7.17)	5.55(9.33)	3.11(7.09)	-0.69	0.45	-1.54	0.34

Note. Est: Estimate; SE: Standard Error; ES: Effect size (Cohen's *d*)

F-Telling: Fortune-Telling; O-Generaliz: Over-Generalizing; S-Abstract: Selective

Abstraction; Personaliz: Personalization

* $p < .05$; ** $p < .01$; Bonferroni's correction applied: 05/8; 01/8

Table 1. Mean and SD of Coping Action Patterns (CAPs) over the four sessions of Brief Psychodynamic Intervention, with HLM slope coefficients over time

CAP	Session 1	Session 2	Session 3	Session 4	Est	SE	<i>T</i>	ES
OCF	.43(.17)	.43(.22)	.45(.20)	.63(.22)	0.07	0.01	4.84**	1.02
P-solving	1.23(3.07)	3.15(7.31)	2.06(5.05)	2.08(4.22)	0.18	0.27	0.67	0.23
Info-seeking	8.46(7.99)	10.63(9.22)	11.08(12.62)	18.46(16.11)	3.10	0.79	3.92**	0.79
Helplessness	15.20(11.91)	11.32(12.26)	12.06(10.95)	12.06(10.95)	-1.15	0.69	-1.67	0.27
Escape	15.94(12.17)	16.70(12.45)	18.01(14.65)	10.04(14.40)	-1.60	0.94	-1.70	0.44
Self-reliance	13.59(10.11)	13.90(15.04)	14.70(12.38)	16.79(17.89)	1.13	0.91	1.23	0.22
S-seeking	14.32(10.68)	8.73(11.24)	7.91(10.74)	13.77(11.78)	-0.34	0.72	-0.47	0.05
Delegation	3.59(5.37)	3.18(5.54)	3.89(5.60)	3.94(7.76)	0.12	0.43	0.27	0.05
Isolation	7.61(8.90)	7.58(8.24)	5.66(7.57)	3.02(6.34)	-1.56	0.43	-3.65**	0.59
Accomod	2.59(4.70)	4.05(6.25)	6.69(9.47)	9.87(11.77)	2.62	.65	4.01**	0.81
Negotiation	2.61(5.21)	2.06(3.50)	2.33(4.77)	2.29(4.70)	-0.09	0.30	-0.29	0.65
Submission	5.43(6.71)	7.25(10.79)	5.60(8.22)	5.35(10.37)	-0.50	0.56	-0.89	0.01
Opposition	9.42(10.67)	11.45(15.80)	10.00(10.48)	7.03(10.38)	-0.84	0.52	-1.61	0.23

Note. Est: Estimate; SE: Standard Error; ES: Effect size (Cohen's *d*); OCF: Overall Coping Functioning: relative frequency of challenge-coping (problem-solving, information-seeking, self-reliance, support-seeking, accommodation, negotiation)

P-solving: Problem-Solving; Info-seeking: Information-seeking; S-seeking: Support-seeking; Accomod: Accomodation

* $p < .05$; ** $p < .01$; Bonferroni correction applied: 05/12; 01/12

Table 2

Mean and SD of Cognitive Errors (CEs) over the four sessions of Brief Psychodynamic Intervention, with HLM slope coefficients over time

CE	Session 1	Session 2	Session 3	Session 4	Est	SE	<i>T</i>	ES
Total CE	85.14(74.12)	68.26(51.64)	72.99(69.59)	46.37(43.80)	-1.93	2.98	-4.00**	0.64
CE Positive	22.30(23.61)	18.19(18.09)	19.57(29.82)	12.16(16.35)	-3.05	1.03	-2.97**	0.50
F-Telling	0.62(2.80)	0.71(2.10)	1.18(2.53)	0.72(1.84)	0.08	0.17	0.50	0.04
O-Generaliz	2.89(5.28)	3.06(5.36)	2.44(4.88)	1.39(3.66)	-0.53	0.27	-1.97*	0.33
S-Abstract	18.60(20.00)	14.09(14.93)	14.94(15.89)	9.10(11.11)	-2.90	0.90	-3.23**	0.59
Personaliz	0.20(1.42)	0.33(1.31)	1.01(3.50)	0.94(3.83)	0.27	0.15	1.84	0.26
CE Negative	60.16(56.99)	50.07(40.62)	53.42(51.84)	34.21(34.33)	-7.99	2.34	-3.42**	0.55
F-Telling	4.54(7.72)	3.92(6.50)	4.80(7.20)	3.60(6.05)	-0.26	0.35	-0.76	0.14
O-Generaliz	18.80(24.38)	14.77(17.73)	16.19(18.72)	10.87(13.14)	-2.43	1.04	-2.33*	0.40
S-Abstract	31.30(30.80)	26.39(23.99)	26.89(27.66)	16.63(19.00)	-4.54	1.36	-3.33**	0.58
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Note. Est: Estimate; SE: Standard Error; ES: Effect size (Cohen's *d*)

F-Telling: Fortune-Telling; O-Generaliz: Over-Generalizing; S-Abstract: Selective

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* $p < .05$; ** $p < .01$; Bonferroni's correction applied: 05/8; 01/8