Is It All about the Higher Dose? Why Psychoanalytic Therapy Is an Effective Treatment for Major Depression

Johannes Zimmermann,[1]* Henriette Löffler-Stastka,[2] Dorothea Huber,[3,4] Günther Klug,[5] Sarah Alhabbo,[1] Astrid Bock[6] and Cord Benecke[1]

[1] *Department of Psychology, University of Kassel, Kassel, Germany*
[2] *Department of Psychoanalysis and Psychotherapy, Medical University of Vienna, Vienna, Austria*
[3] *International Psychoanalytic University Berlin, Berlin, Germany*
[4] *Department of Psychosomatic Medicine and Psychotherapy, Klinikum München-Harlaching, Munich, Germany*
[5] *Department of Psychosomatic Medicine, Technical University Munich, Munich, Germany*
[6] *Institute of Psychology, University of Innsbruck, Innsbruck, Austria*

Empirical evidence for the effectiveness of long-term psychodynamic psychotherapy (LTPP) in patients with mood disorders is growing. However, it is unclear whether the effectiveness of LTPP is due to distinctive features of psychodynamic/psychoanalytic techniques or to a higher number of sessions. We tested these rival hypotheses in a quasi-experimental study comparing psychoanalytic therapy (i.e., high-dose LTPP) with psychodynamic therapy (i.e., low-dose LTPP) and cognitive–behavioural therapy (CBT) for depression. Analyses were based on a subsample of 77 subjects, with 27 receiving psychoanalytic therapy, 26 receiving psychodynamic therapy and 24 receiving CBT. Depressive symptoms, interpersonal problems and introject affiliation were assessed prior to treatment, after treatment and at the 1-, 2- and 3-year follow-ups. Psychoanalytic techniques were assessed from three audiotaped middle sessions per treatment using the Psychotherapy Process Q-Set. Subjects receiving psychoanalytic therapy reported having fewer interpersonal problems, treated themselves in a more affiliative way directly after treatment and tended to improve in depressive symptoms and interpersonal problems during follow-up as compared with patients receiving psychodynamic therapy and/or CBT. Multilevel mediation analyses suggested that post-treatment differences in interpersonal problems and introject affiliation were mediated by the higher number of sessions, and follow-up differences in depressive symptoms were mediated by the more pronounced application of psychoanalytic techniques. We also found some evidence for indirect treatment effects via psychoanalytic techniques on changes in introject affiliation during follow-up. These results provide support for the prediction that both a high dose and the application of psycho-analytic techniques facilitate therapeutic change in patients with major depression. Copyright © 2014 John Wiley & Sons, Ltd.

Key Practitioner Message:
- Psychoanalytic therapy is an effective treatment for major depression, especially in the long run.
- The differential effectiveness of psychoanalytic therapy cannot be fully explained by its higher dose.
- Distinctive features of psychoanalytic technique (e.g., focusing on patients' dreams, fantasies, sexual experiences or childhood memories) may play an important role in establishing sustained therapeutic change.

Keywords: Long-Term Psychodynamic Psychotherapy, Psychoanalytic Technique, Dose Effect, Major Depression, Mediators of Change, Psychoanalysis

During the last decade, empirical evidence for the effectiveness of psychodynamic psychotherapies has grown steadily (Gerber *et al.*, 2011; Gibbons, Crits-Christoph, & Hearon, 2008; Shedler, 2010). This is especially true for short-term psychodynamic psychotherapy (STPP), which has been empirically supported as an effective treatment of specific mental disorders by several randomized controlled trials (for meta-analyses on major depression, see,

*Correspondence to: Johannes Zimmermann, Department of Psychology, University of Kassel, Kassel, Germany.
E-mail: johannes.zimmermann@uni-kassel.de

e.g., Cuijpers, van Straten, Andersson, & van Oppen, 2008; Driessen *et al.*, 2010; Leichsenring, 2001). There is also emerging evidence for long-term psychodynamic psychotherapy (LTPP), which seems to be superior to shorter treatments both at post-treatment and at follow-up (Leichsenring & Rabung, 2008, 2011; Leichsenring, Abbass, *et al.*, 2013).[1] In these studies, LTPP is defined by at least 50 sessions of psychodynamic treatment or by a psychodynamic treatment that lasts for at least 1 year. For even more intensive psychodynamic treatments (e.g., psychoanalytic therapy with more than 100 sessions), the evidence is still limited, although prospective cohort studies have reported substantial pre–post changes in patients with complex mental disorders (de Maat *et al.*, 2013).

Despite the growing evidence for the effectiveness of LTPP in severely disturbed patients, it is unclear *which distinctive features* of such treatments are responsible for their effectiveness. Two features are frequently invoked as explanations in the literature: a higher number of sessions (e.g., Smit *et al.*, 2012) and the specific psychodynamic/psychoanalytic techniques applied by the therapist (e.g., Shedler, 2010). Put more pointedly, the question is whether intensive psychodynamic treatments are effective because they are *intensive* or because they are *psychodynamic/psychoanalytic*. The aim of this study was to test these rival hypotheses using data from the Munich Psychotherapy Study (MPS; Huber, Henrich, Clarkin, & Klug, 2013; Huber, Henrich, Gastner, & Klug, 2012; Huber, Zimmermann, Henrich, & Klug, 2012), which is a quasi-experimental study comparing psychoanalytic therapy (i.e., high-dose LTPP) with psychodynamic therapy (i.e., low-dose LTPP) and cognitive–behavioural therapy (CBT) for depression.

Dose Effects on Psychotherapeutic Outcomes

The most prominent explanation for the effectiveness of LTPP in the current literature is the higher number of sessions as compared with shorter treatments. For example, Smit *et al.* (2012, p. 89) noted that 'any comparison with STPP is (…) complicated, as these studies do not inform us about the causes of a difference in effect size, apart from treatment duration. For example, differences might be purely attention and intensity effects, not related to psychoanalytic therapy *per se*'. In fact, a relatively stable finding across studies is that the amount of psychotherapy is positively related to patient improvement, albeit in a nonlinear fashion (Lambert & Ogles, 2004). In their

seminal meta-analysis on the dose–response relationship, Howard, Kopta, Krause, and Orlinsky (1986) found that the effect of dose on psychotherapeutic outcome follows a negatively accelerated curve, with higher rates of improvement in earlier sessions and lower rates in later sessions. This pattern has been confirmed in many naturalistic studies involving a broad range of outcome measures, patient characteristics, treatment types and number of sessions (e.g., Anderson & Lambert, 2001; Kopta, Howard, Lowry, & Beutler, 1994; Lambert, Hansen, & Finch, 2001). Generally, these studies indicate that, after 10 sessions, a sizeable portion of patients show clinically significant symptom improvements, but more than 50 sessions are needed to reach a response rate of 75% (Lambert & Ogles, 2004). Dose effects have also been reported for interpersonal or personality problems (Kopta *et al.*, 1994) and for more severely disturbed patients (Anderson & Lambert, 2001), although the rates of improvement were expectably lower. Moreover, it should be noted that several studies experimentally tested the effect of dose on psychotherapeutic outcome by randomly assigning depressed patients to 8 or 16 sessions of (different kinds of) psychotherapy (e.g., Barkham *et al.*, 1996; Dekker *et al.*, 2005). However, the results were rather mixed and seem to be of limited utility when estimating dose effects in long-term treatments. In this regard, findings from two recent meta-analyses on LTPP are more informative: Leichsenring and Rabung (2011) found that within-group effect sizes were positively correlated with the number of sessions across all treatment conditions, ranging from $r = 0.37$ for psychiatric symptoms to $r = 0.63$ for social functioning. Moreover, Smit *et al.* (2012) conducted an exploratory meta-regression and found some indication that the between-group effect size of LTPP could be predicted by the ratio of sessions across groups, with an increasing ratio (i.e., the number of LTPP sessions divided by the number of control sessions) showing larger effect sizes. Both findings corroborate the results from naturalistic studies by showing that the effect of dose on psychotherapeutic outcome can also be detected in treatments with more than 50 sessions. In sum, there is a great deal of evidence supporting the hypothesis that the effectiveness of LTPP mainly stems from its high treatment dose.

Effects of Psychodynamic/Psychoanalytic Techniques on Psychotherapeutic Outcomes

The alternative explanation for the effectiveness of LTPP invokes distinctive features of psychodynamic/psychoanalytic techniques. Several authors have provided definitions of what is essential to psychodynamic or psychoanalytic psychotherapy (Ablon & Jones, 1998, 2005; Blagys & Hilsenroth, 2000; Fonagy & Kächele, 2009; Henry,

---

[1]We acknowledge that some researchers question the existing evidence for the effectiveness of LTPP (Smit *et al.*, 2012). However, a detailed discussion of this controversy is beyond the scope of this paper and can be found in the work of Leichsenring, Abbass, *et al.* (2013).

Strupp, Schacht, & Gaston, 1994; Krause, 2009). For example, in their review of the comparative psychotherapy process literature, Blagys and Hilsenroth (2000) delineated seven interventions that distinguished psychodynamic–interpersonal therapy from CBT: (a) a focus on affect and the expression of patients' emotions; (b) an exploration of patients' attempts to avoid topics or engage in activities that hinder the progress of therapy; (c) the identification of patterns in patients' actions, thoughts, feelings, experiences and relationships; (d) an emphasis on past experiences; (e) a focus on patients' interpersonal experiences; (f) an emphasis on the therapeutic relationship; and (g) an exploration of patients' wishes, dreams or fantasies. Their conclusions were based in part on an expert-consensus study conducted by Ablon and Jones (1998, 2005) who asked 11 leading psychoanalytic theoreticians and practitioners to rate the 100 items of the Psychotherapy Process Q-Set (PQS; Jones, 1985) with respect to how characteristic each item was of the principles and activities ideally found in psychodynamic/psychoanalytic therapies. The rank order of items was very reliable (Cronbach's alpha = 0.94), and the most prototypical items comprised all interventions mentioned above (except for the focus on patients' interpersonal experiences), including several other features such as a neutral attitude towards the patient and discussing a patient's sexual feelings and experiences (Ablon & Jones, 1998, 2005).[2] Thus, there seems to be sufficient consensus regarding the distinctive features of psychodynamic/psychoanalytic techniques, from both empirical and conceptual points of view.

Starting from this consensual set of interventions, several studies on short-term psychotherapies tested the effect of psychodynamic or psychoanalytic techniques on outcomes, mostly with positive results (Ablon & Jones, 1998; Ablon, Levy, & Katzenstein, 2006; Gaston *et al.*, 1998; Hilsenroth *et al.*, 2003; Owen & Hilsenroth, 2011; Slavin-Mulford, Hilsenroth, Weinberger, & Gold, 2011). In an early study by Ablon and Jones (1998), raters used the PQS to assess psychotherapy processes in STPP and CBT on the basis of verbatim transcripts of selected therapy sessions. The item profile of each session was correlated with the profile of prototypical psychoanalytic techniques (see above), yielding an empirical measure of the degree to which a session adhered to the

theoretical principles of psychoanalytic psychotherapy. In one of two STPP samples, adherence to the psychoanalytic prototype was positively correlated with several outcome measures. Even more interesting, the application of psychoanalytic techniques was also positively correlated with the outcome in CBT for depression (Ablon & Jones, 1998). In a subsequent study on STPP for panic disorder, Ablon *et al.* (2006) showed that, although the psychotherapy that was delivered corresponded mainly to the cognitive–behavioural prototype, only adherence to the psychoanalytic prototype was positively correlated with self-reported outcome.

More recently, similar findings were reported by Hilsenroth and colleagues (Hilsenroth *et al.*, 2003; Owen & Hilsenroth, 2011; Slavin-Mulford *et al.*, 2011) using the Comparative Psychotherapy Process Scale (Hilsenroth, Blagys, Ackerman, Bonge, & Blais, 2005) to assess psychodynamic–interpersonal and cognitive–behavioural techniques from videotaped sessions. In their studies on naturalistic STPP, they found that psychodynamic–interpersonal techniques predicted positive outcomes both in patients with major depression (Hilsenroth *et al.*, 2003) and in patients with an anxiety disorder (Slavin-Mulford *et al.*, 2011). Moreover, a study by Owen and Hilsenroth (2011) revealed that patients with better alliances benefitted significantly more from psychodynamic–interpersonal interventions than patients with poorer alliances, thereby replicating earlier findings by Gaston *et al.* (1998). Taken together, there is growing evidence that psychodynamic or psychoanalytic techniques are positively associated with various outcome measures across different treatment settings and disorders. Although the studies reported above consistently focused on the immediate effects of short-term treatments, it seems plausible to hypothesize that psychoanalytic techniques are also involved in facilitating sustained change in LTPP. Thus, the effectiveness of intensive psychodynamic treatments such as psychoanalytic therapy may not stem from the higher number of sessions but from applying more psychoanalytic techniques (as compared with less intensive or non-psychodynamic treatments).

The Current Study

The aim of the current study was to test these two rival hypotheses empirically. Therefore, we employed data from the MPS comparing psychoanalytic therapy (i.e., high-dose LTPP) with psychodynamic therapy (i.e., low-dose LTPP) and CBT in severely depressed patients. In previous publications using these data, Huber, Zimmermann, *et al.* (2012) and Huber *et al.* (2013) found that patients receiving psychoanalytic therapy had more favourable symptom trajectories across a 3-year follow-up period than patients receiving psychodynamic therapy or CBT. In the present study, we tested whether this differential long-term effect of psychoanalytic

---

[2]In the prior literature, this PQS prototype has been labelled as both 'psychodynamic' (Ablon & Jones, 1998) and 'analytic' (Ablon & Jones, 2005). In the following, we will use the term 'psychoanalytic' when referring to this specific set of techniques for two reasons: first, it contains several aspects that are less typical or even de-emphasized in psychodynamic as compared with psychoanalytic treatments (e.g., neutral attitude towards the patient and focus on past experiences). Second, psychodynamic treatments are more likely to include other (e.g., supportive) techniques, suggesting that in psychoanalytic treatments, this set of techniques might be applied in its most pure form. This is in line with empirical results that have shown that psychoanalytic therapy sessions adhere more closely to the PQS prototype than psychodynamic therapy sessions do (Ablon & Jones, 2005).

therapy would be mediated by the number of sessions and/or psychoanalytic technique. Our analyses were based on three self-reported outcome measures that tracked changes in depressive symptoms, interpersonal problems and introject affiliation. These outcome measures were selected to cover a broad spectrum of change processes, including changes in primary symptoms as well as changes in more enduring interpersonal and intrapsychic aspects of patients' personalities. Because the previous literature has provided support for both dose-based and technique-based explanations for the effectiveness of LTPP, we had no *a priori* assumptions about which of the two hypotheses would be more valid. Finally, note that the main focus of this study was on the indirect effects of dose and psychoanalytic technique on the *long-term* outcomes across the 3-year follow-up period. This is because the *immediate* treatment outcome might be confounded with the mediating variables (e.g., some treatments might have been shorter *because* symptoms improved earlier), whereas the long-term outcome cannot (i.e., after a treatment is completed, the number of sessions and the employed techniques are fixed and cannot be influenced by future changes in symptoms). However, for the sake of completeness, we also tested respective indirect effects on the immediate post-treatment outcome.

METHOD

Study Design

The MPS is a comparative quasi-experimental study of psychoanalytic therapy, psychodynamic therapy and CBT. It was designed to maximize external validity by examining non-manualized and representative psychotherapies under the conditions of day-to-day practice conducted by experienced psychotherapists, while improving internal validity by recruiting a diagnostically homogeneous sample, blinding interviewers and raters with regard to treatment modality and randomly allocating participants to certain treatment groups. That is, the MPS shares some characteristics with effectiveness studies (i.e., pragmatic studies that investigate treatments under 'real-world' conditions) and some characteristics with efficacy studies (i.e., explanatory studies that investigate

treatments under ideal conditions; Thorpe *et al*., 2009).[3] The term 'quasi-experimental' denotes the fact that, due to limited financial resources, the randomized allocation began with psychoanalytic and psychodynamic therapies and included CBT later on. Specifically, CBT was included by suspending the random assignment to the psychoanalytic versus psychodynamic therapies and assigning patients directly to CBT until the CBT condition contained as many patients as the other two conditions. That is, participants had equal chances of being assigned to psychoanalytic versus psychodynamic therapy throughout the study (i.e., they were fully randomly allocated to these two treatment conditions), whereas the chance of being assigned to CBT was different (at least in the earlier phase of the study).[4] The study was conducted at the Department of Psychosomatic Medicine and Psychotherapy, Technische Universität München (TUM, Germany). The study protocol was approved by the Ethics Committee of the TUM. More detailed descriptions of the study design can be found in the works of Huber, Henrich, *et al*. (2012), Huber, Zimmermann, *et al*. (2012) and Huber *et al*. (2013).

Sample

The full intent-to-treat sample consisted of 100 patients, with 35 patients receiving psychoanalytic therapy, 31 patients receiving psychodynamic therapy and 34 patients receiving CBT. Inclusion criteria required participants to have the following: (a) a Beck Depression Inventory (BDI) total score of at least 16 (which was established as a cut-off for screening purposes) and (b) a primary diagnosis of a major depressive disorder with a current moderate or severe episode (*International Classification of Diseases*, 10th revision, diagnosis F 32.1/2 or F 33.1/2 or *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, diagnosis 296.22/23 or 296.32/33) or a double depression characterized by both dysthymic disorder and a current moderate or severe depressive episode. Exclusion criteria were bipolar affective disorder, depression due to somatic illnesses or diseases of the brain, alcohol or substance dependence, psychotherapy during the past 2 years and concurrent antidepressants. For a more detailed description of the intent-to-treat sample, see Huber, Henrich, *et al*. (2012) and Huber, Zimmermann, *et al*. (2012).

---

[3]This is essentially a trade-off as some features (e.g., the lack of treatment manuals) may represent a strength in terms of generalizability to "real-world" conditions (e.g., therapists usually do not adhere to manuals) but may represent a limitation in terms of the interpretability of the results (e.g., it might be unclear what the therapists actually did in treatment). In this regard, one should keep in mind that, at the time the MPS started, manuals for LTPP were not available. One might even argue that the usual format of manuals, precisely describing therapeutic action in a determined order session by session, is at odds with the psychoanalytic approach to psychotherapy and impossible to realize for long-term treatments.

[4]Note that at the beginning of the study, an external randomization board was established to examine whether a patient could be randomly allocated to the experimental groups (taking into account criteria such as strong preference for a specific therapy and time resources). Participants were included only if they met this criterion. After the inclusion of CBT, the external randomization board confirmed that all participants who had been randomized prior to the inclusion of CBT would also have been eligible for CBT.

All sessions of all treatments were supposed to be audio-recorded by therapists. The three sessions in the middle of each treatment were selected to be analysed in terms of psychotherapy processes (see below). In the following analyses, we included only the following patients: (a) those who provided ratings on outcome measures at post-treatment or follow-up and (b) those whose middle sessions were audio-recorded with sufficient quality. Four patients dropped out during treatment and did not provide further ratings on outcome measures. In 19 cases, audio recordings of middle sessions were not available or had to be excluded due to low audio quality. Thus, the final sample consisted of 77 patients, with 27 patients receiving psychoanalytic therapy, 26 patients receiving psychodynamic therapy, and 24 patients receiving CBT. As shown in Table 1, there were no significant differences in demographic or diagnostic variables at pre-treatment between groups except for age. Therefore, we included age as a covariate in the following analyses.

Treatments

Treatments were 'real-world', non-manualized and representative psychotherapies provided in the German healthcare system by 21 highly experienced psychotherapists (the mean duration of their psychotherapeutic practice was 15 years; their mean age was 47 years); 14 therapists delivered both psychoanalytic and psychodynamic therapies, and seven therapists delivered CBT. As we had to exclude 23 patients from the present analyses (see above), the number of therapists involved in this study was reduced to 19. There were no significant differences in training, expertise or experience between the therapists who administered the different treatment modalities.

Psychoanalytic therapy is defined as an interpretative, insight-oriented approach that is aimed at modifying maladaptive representations of the self and others that lie at the root of psychopathology (Fonagy & Kächele, 2009). It involves careful attention to the therapist–patient interaction with thoughtfully timed interpretation of transference and resistance (Gabbard, 2004). According to the German Psychotherapy Guidelines (Rüger, Dahm, & Kallinke, 2003), the average dose is between 160 and 240 sessions; session frequency is two to three sessions per week with the patient lying on a couch. In the present study, the dose ranged from 58 to 356 sessions ($M = 241.3$, $SD = 89.9$) and the duration from 12 to 72 months ($M = 39.3$, $SD = 16.6$).

Psychodynamic therapy is based on the same principles of theory and technique but is more limited in the depth of the therapeutic process and in its goals by focusing on symptom-sustaining here-and-now conflicts without enhancing regression in the therapeutic process. Its mean dose is between 50 and 80 sessions, and the session frequency is one session per week with the patient sitting in a face-to-face position (Rüger *et al.*, 2003). In the present study, the dose ranged from 18 to 218 sessions ($M = 85.4$, $SD = 56.5$) and the duration from 11 to 118 months ($M = 32.6$, $SD = 24.2$).

Cognitive–behavioural therapy comprises therapeutic modalities developed on the basis of a psychology of learning and social psychology and combines cognitive and behavioural techniques to modify distorted or maladaptive cognitions and facilitate positive thoughts and behaviours (Hollon & Beck, 2004). The therapist employs a goal-directed, problem-focused and directive approach, often using homework assignments to stabilize therapeutic progress. According to the German Psychotherapy Guidelines, the average dose is between 45 and 60 sessions, and the session frequency is one session per week (Rüger *et al.*, 2003). In the present study, the dose ranged from 19 to 100 sessions

Table 1. Pre-treatment sample description

	Psychoanalytic therapy	Psychodynamic therapy	Cognitive–behavioural therapy	
Sample size	27	26	24	
Age (years)	31.0 (6.0)	35.7 (7.3)	34.3 (5.5)	$F_{(2, 74)} = 3.83^*$
Female	19	16	21	$\chi^2_{(2)} = 4.36$
Relationship status				$\chi^2_{(4)} = 2.82$
Single	12	10	7	
Separated	10	7	9	
Partnership	5	9	8	
Duration of illness in months	73.5 (85.6)	67.5 (87.5)	61.4 (74.8)	$F_{(2, 74)} = 0.13$
Severe depressive episode	12	9	9	$\chi^2_{(2)} = 0.57$
Double depression	17	13	10	$\chi^2_{(2)} = 2.37$
Personality disorder	9	8	7	$\chi^2_{(2)} = 0.11$

$^*p < 0.05$.

($M = 50.8$, $SD = 23.3$) and the duration from 8 to 78 months ($M = 29.0$, $SD = 15.5$).

Previous publications on the full intent-to-treat sample have shown that the integrity of the three treatments was adequate (Huber, Zimmermann, et al., 2012; Huber et al., 2013). Specifically, the therapists who delivered the psychoanalytic and psychodynamic treatments rated each treatment every 6 months on various parameters (cf. Beenen & Stoker, 1996), and results showed that in the psychoanalytic treatments, the session frequency was higher, patients were lying down rather than sitting, transference to the therapist was stronger and the employed techniques were insight oriented rather than supportive (Huber et al., 2013). Moreover, 50% of the treatments from all three experimental groups were selected at random, and one audiotaped session from the middle of each treatment was assessed by trained raters using the PQS (see below). Results showed that psychoanalytic techniques were more salient in psychoanalytic therapy sessions as compared with the other two conditions, and cognitive–behavioural techniques were more salient in CBT sessions as compared with the other two conditions (Huber, Zimmermann, et al., 2012). The present study extended these findings on treatment integrity by analysing a larger sample of middle sessions.

Measures

Depressive Symptoms

We assessed the severity of depressive symptoms using the BDI (Beck et al., 1961; German version: Hautzinger, Bailer, Worall, & Keller, 1995). The BDI contains 21 multiple-choice items covering a broad spectrum of depressive symptoms. Respondents are asked to indicate the intensity of each symptom during the last week. The BDI is one of the most common self-report measures of depression, generally showing good reliability and validity (Beck, Steer, & Garbin, 1988).

Interpersonal Problems

The severity of interpersonal problems was assessed by means of the Inventory of Interpersonal Problems—Circumplex (IIP-C; Alden, Wiggins, & Pincus, 1990; German version: Horowitz, Strauß, & Kordy, 2000). The IIP-C contains 64 items describing deficits or excesses related to specific interpersonal behaviours. For each item, respondents are asked to indicate the amount of distress on a 5-point scale ranging from 0 (not at all) to 4 (extremely). We used the global score, with high values indicating more interpersonal distress (Tracey, Rounds, & Gurtman, 1996). The IIP-C is a widely used measure of interpersonal problems with good psychometric

properties and is well accepted across theoretical and therapeutic orientations (Hughes & Barkham, 2005).

Introject Affiliation

Introjects (i.e., the habitual way people treat themselves) were assessed by means of the introject surface of the INTREX short form (Benjamin, 1983; German version: Tress, 1993). The INTREX is a self-report measure based on the Structural Analysis of Social Behavior (SASB; Benjamin, 1974). The introject surface of the SASB cluster model combines the dimensions of affiliation (active self-love vs self-attack) and interdependence (self-emancipation vs self-control) into eight clusters. Participants are asked to rate how they treat themselves at their best and at their worst. Each of the eight SASB clusters is measured with a single item for best and worst, respectively, using a scale from 0 to 100. For instance, the positive pole of the affiliation dimension (i.e., active self-love) is represented by the item 'I tenderly, lovingly cherish myself', and the negative pole (i.e., self-attack) is represented by the item 'Without considering what might happen, I hatefully reject and destroy myself'. Individual items can be aggregated into 'vector scores' for measuring individual differences in introject affiliation and autonomy (Pincus, Newes, Dickinson, & Ruiz, 1998). In the following analyses, we used only the vector score for introject affiliation at worst. Previous research has shown that this dimension is at the core of psychopathology (Monsen et al., 2007; Pincus, Gurtman, & Ruiz, 1998) and can be considered to be a primary target of psychotherapeutic change (e.g., Bedics, Atkins, Comtois, & Linehan, 2012).

Psychoanalytic Technique

Psychoanalytic technique was assessed with the PQS (Jones, 1985; German version: Albani et al., 2000). The PQS is a pantheoretically developed instrument that provides a comprehensive language and rating system for describing psychotherapy processes. It consists of 100 items (i.e., the 'Q set') covering actions, behaviours and thoughts of both therapist and patient in individual and dyadic terms (e.g., 'Therapist suggests that patient accept responsibility for his/her problems', 'Patient expresses angry or aggressive feelings' or 'Sexual feelings and experiences are discussed'). Raters listen to audio tapes (or read verbatim transcripts) of a full therapy session and are asked to sort the 100 items in the Q set on a continuum from least characteristic (Category 1) to most characteristic (Category 9). The middle pile (Category 5) is used for items deemed either neutral or irrelevant to the particular hour being rated. Raters are forced to adhere to a fixed normal distribution, thereby ensuring multiple evaluations of items and attenuating rater biases such as response sets and halo effects. Afterwards, the profile of a given session can be correlated with profiles

of 'ideal' psychotherapeutic processes that have been developed on the basis of expert ratings for a range of therapeutic approaches (Ablon & Jones, 1998, 2002). These 'prototypes' can be conceived of as the shared knowledge of leading experts, delineating which techniques are consensually regarded as characteristic versus uncharacteristic of a specific approach (see above). The (Fisher-z transformed) correlations of the profile with these prototypes represent the extent to which a specific therapeutic approach is implemented in a given session and can be conceived of as a measure of adherence. We computed correlations of the profiles with the psychoanalytic prototype (PA prototype). Across samples and therapies, PA prototype mean scores usually range from 0 to 0.50 (Ablon & Jones, 1998, 2005), with higher values reflecting techniques that are more typical of a psychoanalytic approach to psychotherapy. Note that we did not include correlations of the profiles with the cognitive–behavioural prototype in the main analyses as we had no *a priori* hypotheses about the effect of cognitive–behavioural techniques on outcomes within long-term treatments. However, for the sake of completeness, we will report the respective results in a footnote. The PQS has demonstrated reliability and validity across a variety of different treatments including psychoanalytic, psychodynamic, cognitive–behavioural and other therapies (Ablon & Jones, 2002, 2005; Jones, Cumming, & Horowitz, 1988; Jones & Pulos, 1993).

In the present study, PQS ratings were based on audio recordings of three therapy sessions from the middle of each treatment. We favoured middle sessions over early sessions because it seemed unreasonable to assume that psychoanalytic techniques such as focusing on sexual experiences, making transference interpretations or reconstructing childhood experiences would ever be employed during the early sessions of a long-term treatment. In fact, using such techniques during the early sessions might even be considered to be counterproductive (e.g., Gabbard & Horowitz, 2009; Krause, 2009). More generally, we argue that when assessing specific therapeutic processes (as compared with unspecific processes such as therapeutic alliance), middle sessions might be more representative of the intense working phase of a therapy as compared with early sessions (which are usually about defining roles, establishing an alliance etc.) or late sessions (which are usually about reflecting on achievements, the upcoming termination of therapy or expectations for the future). The main drawback of using middle sessions is that the therapeutic processes are probably influenced by prior symptom change. The specific sessions that were analysed were selected purely on arithmetic grounds (e.g., in a treatment with a total number of 100 sessions, we selected the 49th, 50th and 51st sessions). Independent ratings of three sessions were available in 73 cases.

In three cases, ratings were available from two sessions, and in one case, ratings were available from one session. Each of the 226 sessions was rated by one of two raters, both blind to any information about patient, therapist, treatment and outcome.[5] The sessions were given to the raters in a random order to avoid memory effects. Inter-rater reliability was assessed in a subsample of 29 sessions. Profile correlations ranged from 0.37 to 0.87 with a median value of 0.65. The intraclass correlation coefficient (ICC) for the PA prototype score was ICC(2, 1) = 0.59, $p < 0.001$, which is 'fair' according to Cicchetti's (1994) guidelines and typical for psychodynamic adherence measures (e.g., Leichsenring, Salzer, *et al.*, 2013). To further enhance reliability, we combined PA prototype scores from the three sessions per treatment. As sessions from the same treatment were assessed by different raters (due to the randomized presentation of sessions), this kind of data aggregation was chosen to help cancel out rater-specific measurement error. The internal consistency of the average PA prototype score was $\alpha = 0.78$. Thus, treatment differences in psychoanalytic technique were relatively stable across the three middle sessions. All subsequent analyses were based on the average PA prototype score.

Statistical Analyses

We used a mediation analysis to test whether the differential long-term effect of psychoanalytic therapy was due to the number of sessions and/or the psychoanalytic technique (Hayes, 2009; MacKinnon, 2008). In its simplest form, a mediation analysis requires two linear regression models to be computed to assess the effect of the independent variable on the mediating variable (Path *a*) and the effect of the mediating variable on the outcome variable while controlling for the independent variable (Path *b*). After that, the significance of the indirect effect can be directly tested by comparing the product of the two regression coefficients (*ab*) with its standard error. Because the sampling distribution of the product deviates from a normal distribution, it is recommended that bootstrap (Preacher & Hayes, 2004) or Monte Carlo (Preacher & Selig, 2012) confidence limits be computed for significance testing (MacKinnon, Lockwood, & Williams, 2004).

We expanded the simple mediation analysis in several respects (Figure 1): first, because the independent variable

---

[5] Prior to rating these sessions, raters were trained by a psychiatrist and psychoanalyst (the second author) who was originally certified as a PQS rater by Enrico E. Jones in 2002. Raters had no psychiatric or psychotherapeutic background. During their training, they had to rate film sequences that included problematic dyadic situations (e.g., specific sequences from the film 'The Silence of the Lambs', 1991).
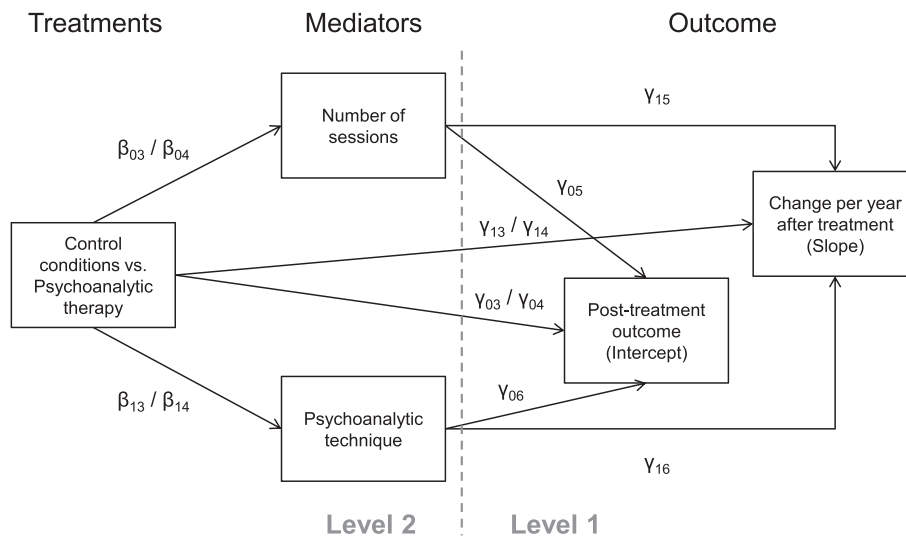
Figure 1.   Upper-level mediation with a multicategorical independent variable and two mediators at Level 2

was multicategorical, we used dummy coding to define psychodynamic therapy and CBT as dummy variables and psychoanalytic therapy as the reference group (Hayes & Preacher, 2011). Thus, we will present two separate mediation analyses, each time estimating the *relative* indirect effect of psychoanalytic therapy as compared with a different 'control' condition (i.e., psychodynamic therapy or CBT). Second, because our hypothesis involved two rival intervening processes, we used a multiple-mediator model (Preacher & Hayes, 2008). This requires that two separate regression analyses be computed to assess the effects of the dummy variables on both the number of sessions and the psychoanalytic technique. Moreover, we included age and the pre-treatment scores of the outcome variable as covariates (not shown in Figure 1).[6] This resulted in the following regression equations for Path *a*:

$$DOSE_i = \beta_{00} + \beta_{01}*AGE_i + \beta_{02}*PRE\text{-}OUTCOME_i \\ + \beta_{03}*CBT_i + \beta_{04}*PDT_i + \varepsilon_i$$

$$PA\,PROTOTYPE_i = \beta_{10} + \beta_{11}*AGE_i + \beta_{12}*PRE\text{-}OUTCOME_i \\ + \beta_{13}*CBT_i + \beta_{14}*PDT_i + \varepsilon_i,$$

(1)

where $DOSE_i$ and PA PROTOTYPE$_i$ represent the number of sessions and the salience of the psychoanalytic technique in sessions of patient i's treatment (i.e., the mediating variables), CBT and PDT are the dummy-coded independent variables, AGE and PRE-OUTCOME are covariates and β_{03}, β_{04}, β_{13} and β_{14} are the regression coefficients of interest, representing the relative effects of psychoanalytic therapy on the mediating variables (Figure 1). These models were fit with R (R Core Team, 2013) using ordinary least square estimation and robust standard errors (Long & Ervin, 2000).

Third, as we were interested in symptom change after treatment, we used a multilevel mediator model (Krull & MacKinnon, 2001). Because only the outcome variable varied within persons, the appropriate model type was upper-level mediation ($2 \rightarrow 2 \rightarrow 1$). Upper-level mediation can be implemented by fitting a multilevel model with years after treatment as the Level-1 predictor and dummy variables for the treatment groups as well as the mediating variables as the Level-2 predictors. To control for individual differences in age and pre-treatment scores on the outcome variables, we included the respective variables as covariates at Level 2. Moreover, we included random effects of the intercept and the slope to allow for individual differences in the trajectories of change.[7] This resulted in the following multilevel regression model for Path *b*:

---

[6]We imputed three missing data points in pre-treatment INTREX scores using the expectation–maximization algorithm in PASW 18 (IBM Corporation, Armonk, NY; Schafer & Graham, 2002). Data imputation was based on the available demographic and clinical pre-treatment data (Table 1) as well as the pre-treatment BDI and IIP-C scores.

---

[7]We acknowledge that outcome differences between patients (as well as differences in dose and technique) may be due to differences between *therapists* and that ignoring this nested factor may bias parameter estimates (Wampold & Serlin, 2000). Thus, we repeated all analyses with the 19 therapists included as random effects at Level 2 (in Path *a* regressions) or as random effects of the intercept and slope at Level 3 (in Path *b* regressions). The results were virtually the same, and thus, we decided to present the simpler model.

$$\text{OUTCOME}_{ij} = \pi_{0i} + \pi_{1i}*\text{TIME}_{ij} + \varepsilon_{ij}$$

$$\pi_{0i} = \gamma_{00} + \gamma_{01}*\text{PRE-OUTCOME}_i + \gamma_{02}*\text{AGE}_i + \gamma_{03}*\text{CBT}_i + \gamma_{04}*\text{PDT}_i + \gamma_{05}*\text{DOSE}_i + \gamma_{06}*\text{PA PROTOTYPE}_i + \zeta_{0i} \quad (2)$$

$$\pi_{1i} = \gamma_{10} + \gamma_{11}*\text{PRE-OUTCOME}_i + \gamma_{12}*\text{AGE}_i + \gamma_{13}*\text{CBT}_i + \gamma_{14}*\text{PDT}_i + \gamma_{15}*\text{DOSE}_i + \gamma_{16}*\text{PA PROTOTYPE}_i + \zeta_{1i}.$$

The first row includes the Level-1 submodel, where OUTCOME_{ij} represents the value of the outcome variable of patient i at time j, TIME_{ij} represents the number of years after the end of treatment at that time and the parameters π_{0i} and π_{1i} represent patient i's estimated post-treatment status (i.e., Level-1 intercept) and estimated rate of change per year during the follow-up period (i. e., Level-1 slope), respectively. The subsequent rows present the Level-2 submodel for predicting interindividual differences in post-treatment status and rate of change during follow-up. Specifically, γ_{00} and γ_{10} represent the estimated post-treatment status and rate of change of patients receiving psychoanalytic therapy; γ_{01} to γ_{06} and γ_{11} to γ_{16} represent the unique influences of the covariates, treatment groups and mediators on the Level-1 parameters; and ζ_{0i} and ζ_{1i} represent those portions of the Level-1 parameters that remain unexplained at Level 2 (i.e., the random effects). In line with our hypothesis, we mainly focused on γ_{15} and γ_{16}, representing the specific effects of dose and psychoanalytic technique on the slope of the outcome (i.e., on its rate of change per year after treatment). However, we also considered γ_{05} and γ_{06}, representing the specific effects of the mediators on the intercept of the outcome (i.e., on its expected value at post-treatment; Figure 1). All models were fit using the software package HLM 6.08 (Scientific Software International, Inc., Skokie, IL) with restricted maximum likelihood estimation and robust standard errors.

Finally, we computed the products of the regression coefficients from the single-level models (Path *a*) and the multilevel model (Path *b*) and assessed their statistical significance using Monte Carlo confidence intervals (CI; Preacher & Selig, 2012; Selig & Preacher, 2008). All mediation analyses were computed separately for each of the three outcome measures.

RESULTS

Descriptive Analyses

Table 2 summarizes the descriptive characteristics and intercorrelations of the mediators and outcome variables in the combined sample. Unsurprisingly, the two mediators were moderately correlated, which means that patients who received more sessions were likely to receive more psychoanalytic interventions. Note,

however, that dose and psychoanalytic technique were uncorrelated *within* treatment conditions (i.e., when controlling for the two dummy-coded treatment variables; $r = 0.03$, $p = 0.81$; not shown in Table 2). Both mediators were generally not associated with the pre-treatment scores of the outcome measures but tended to be negatively associated with the outcome measures at several follow-up occasions. Taken together, these findings suggest that both variables are indeed plausible candidates for explaining variance in long-term outcomes.

Total Effects of Psychoanalytic Therapy on Outcome

In a preliminary step, we looked for the differential *total* effects of psychoanalytic therapy on the intercept and slope in the multilevel analyses. Therefore, we fit models in which the mediating variables were omitted from Equation 2. The results are presented in Table 4 in the first column for each outcome measure, respectively. The expected mean scores of outcome measures directly after treatment for patients who received psychoanalytic therapy were clearly in the non-clinical range (γ_{00}). Moreover, these patients showed further improvements during the 3-year follow-up period as their depressive symptoms and interpersonal problems decreased, and their habitual way of treating themselves became more affiliative (γ_{10}). When considering the total effects of psychoanalytic therapy as compared with CBT, the results suggest that participants receiving CBT had more interpersonal problems and more hostile introjects directly after treatment (γ_{03}) and tended to show a less advantageous trajectory of change in terms of depressive symptoms and interpersonal problems during the 3-year follow-up period (γ_{13}). A similar picture emerged for the total effects of psychoanalytic therapy as compared with psychodynamic therapy: participants receiving psychodynamic therapy had more hostile introjects directly after treatment (γ_{04}) and were less likely to improve during follow-up in terms of depressive symptoms (γ_{14}). However, psychoanalytic and psychodynamic therapies did not differ with regard to changes in interpersonal problems. In sum, these findings are in line with the differential effectiveness of psychoanalytic therapy that has been reported for the full intent-to-treat sample of the MPS (for more detailed results on effect sizes and response rates, see Huber, Zimmermann, *et al.*, 2012; Huber *et al.*, 2013).

Table 2. Descriptive statistics and intercorrelations of target variables

		Descriptive statistics				Correlations with mediators	
	N	Range			M	SD	Dose	Technique
Mediators								
Dose	77	0.18	—	3.56	1.29	1.05		
Technique	77	−0.18	—	0.48	0.19	0.13	0.33**	
BDI								
Pre	77	16	—	47	25.43	8.21	−0.05	−0.09
Post	75	0	—	28	6.93	7.00	−0.03	−0.08
Fu 1	72	0	—	41	8.04	8.14	−0.09	−0.18
Fu 2	63	0	—	43	8.41	9.25	−0.21#	−0.30*
Fu 3	66	0	—	36	7.58	7.98	−0.31*	−0.28*
IIP-C								
Pre	77	0.33	—	2.63	1.75	0.43	0.02	0.06
Post	75	0.08	—	2.41	1.27	0.57	−0.26*	−0.22#
Fu 1	70	0.13	—	2.77	1.31	0.62	−0.40***	−0.22#
Fu 2	61	0.11	—	2.94	1.33	0.57	−0.40***	−0.30*
Fu 3	64	0.20	—	2.43	1.14	0.59	−0.42***	−0.25*
INTREX								
Pre[+]	77	−168	—	145	−55.2	59.8	−0.05	−0.06
Post	77	−140	—	168	4.9	79.7	0.26*	0.06
Fu 1	73	−168	—	168	9.4	71.4	0.20#	0.01
Fu 2	60	−105	—	150	11.6	71.0	0.29*	0.25#
Fu 3	57	−115	—	164	30.4	73.3	0.29**	0.19

Dose = number of sessions/100. Technique = average Fisher-z transformed profile correlations with the psychoanalytic Psychotherapy Process Q-Set prototype. BDI = Beck Depression Inventory. IIP-C = Inventory of Interpersonal Problems—Circumplex. INTREX = introject affiliation at worst. Pre = pre-treatment score. Post = post-treatment score. Fu 1 = 1 year after termination. Fu 2 = 2 years after termination. Fu 3 = 3 years after termination.
[+]Three missing values were imputed on the basis of pre-treatment data using the expectation–maximization algorithm in PASW 18 (IBM Corporation).
#$p < 0.10$,
*$p < 0.05$,
**$p < 0.01$,
***$p < 0.001$.

Explaining Outcome Differences between Psychoanalytic Therapy and Cognitive–Behavioural Therapy

Table 3 summarizes the results of the regression analyses for Path *a*. When focusing on the relative differences between psychoanalytic therapy and CBT, the results show that psychoanalytic therapy comprised a strikingly greater number of sessions than CBT (β_{03}), and psychoanalytic interventions were far more typical for psychoanalytic therapy than for CBT (β_{13}). This was true irrespective of which pre-treatment outcome variable was controlled for. However, it should be noted that, on average, psychoanalytic techniques were less salient in psychoanalytic sessions than in former studies, as $B = 0.26$ for the intercept β_{10} is clearly lower than the average PA prototype score for the psychoanalytic therapies reported by Ablon and Jones (2005).

The results for Path *b* are presented in Table 4 in the second column of each respective outcome measure. When focusing on the long-term outcome during follow-up, we found that when controlling for age, pre-treatment status, treatment group and psychoanalytic technique, the number of sessions failed to reach statistical significance in predicting the change in outcome measures (γ_{15}). By contrast, psychoanalytic technique was a unique predictor of follow-up changes in depressive symptoms and introject affiliation (γ_{16}); this means that patients who received a larger number of psychoanalytic interventions had more favourable symptom trajectories and developed a more affiliative introject during follow-up, even when controlling for age, pre-treatment status, treatment group and number of sessions.[8] Note that the direct

[8]To gauge the practical implications of these effects, we computed the change in BDI and INTREX scores during the 3-year follow-up period that would be expected from a difference of 1 SD in the PA prototype score. Everything else being equal, patients who received more psychoanalytic techniques (+0.13) were expected to show a reduction of 1.63 BDI points and an increase of 15.2 INTREX points at the 3-year follow-up.

Table 3. Predicting dose and psychoanalytic technique (Path a)

		Dose				Psychoanalytic technique		
		B	SE	β		B	SE	β
BDI as covariate								
Intercept†	β_{00}	2.430***	0.176		β_{10}	0.259***	0.020	
Pre-treatment score‡	β_{01}	−0.016#	0.008	−0.126	β_{11}	−0.002	0.002	−0.099
Age‡	β_{02}	0	0.010	−0.001	β_{12}	0.003	0.002	0.155
CBT (vs PAT)	β_{03}	−1.931***	0.186	−0.857	β_{13}	−0.149***	0.031	−0.543
PDT (vs PAT)	β_{04}	−1.588***	0.207	−0.719	β_{14}	−0.072*	0.035	−0.267
IIP-C as covariate								
Intercept†	β_{00}	2.424***	0.179		β_{10}	0.258***	0.020	
Pre-treatment score‡	β_{01}	−0.029	0.162	−0.012	β_{11}	0.004	0.039	0.014
Age‡	β_{02}	0.004	0.010	0.027	β_{12}	0.003	0.002	0.177
CBT (vs PAT)	β_{03}	−1.923***	0.188	−0.853	β_{13}	−0.148***	0.031	−0.538
PDT (vs PAT)	β_{04}	−1.576***	0.217	−0.714	β_{14}	−0.072*	0.034	−0.266
INTREX as covariate								
Intercept†	β_{00}	2.434***	0.178		β_{10}	0.257***	0.021	
Pre-treatment score‡	β_{01}	0.001	0.001	0.056	β_{11}	0	0	−0.031
Age‡	β_{02}	0.004	0.010	0.023	β_{12}	0.003	0.002	0.178
CBT (vs PAT)	β_{03}	−1.933***	0.186	−0.858	β_{13}	−0.147***	0.031	−0.536
PDT (vs PAT)	β_{04}	−1.596***	0.210	−0.723	β_{14}	−0.070#	0.037	−0.260

$N = 77$. Dose = number of sessions/100. Psychoanalytic technique = average Fisher-z transformed profile correlations with the psychoanalytic Psychotherapy Process Q-Set prototype. CBT = cognitive–behavioural therapy. PAT = psychoanalytic therapy. PDT = psychodynamic therapy. BDI = Beck Depression Inventory. IIP-C = Inventory of Interpersonal Problems—Circumplex. INTREX = introject affiliation at worst.
†Represents the estimate for patients receiving psychoanalytic therapy.
‡Mean centred.
#$p < 0.10$,
*$p < 0.05$,
**$p < 0.01$,
***$p < 0.001$.

effects of psychoanalytic therapy on long-term outcome were generally not significant (γ_{13}), suggesting that the mediating variables were successful in explaining the total effect.

Although not central to this paper, we also considered effects of the mediating variables on the outcome measures directly after treatment. In this regard, we found that a higher dose was uniquely associated with fewer interpersonal problems and more affiliative introjects directly after treatment (γ_{05}), whereas psychoanalytic technique was unrelated to post-treatment outcome (γ_{06}). This suggests that, irrespective of age, pre-treatment status, treatment group and applied techniques, attending a larger number of sessions helped patients reduce their interpersonal distress and their hostility towards themselves during treatment. Again, the direct effects of psychoanalytic therapy were not significant (γ_{03}).

Finally, we tested the mediation hypotheses using 95% Monte Carlo CIs for the products of the coefficients of Paths *a* and *b*. As shown in the third column of Table 5, only psychoanalytic technique but not number of sessions mediated the differential long-term

effect of psychoanalytic therapy on depressive symptoms. For interpersonal problems, neither psychoanalytic technique nor number of sessions turned out to be a significant mediator. As we did not find a differential long-term effect of psychoanalytic therapy for introject affiliation, testing for mediation might seem unreasonable because there was no total effect that could be explained. However, Hayes (2009) noted that even in such cases, mediation can be present as other mediators might be operating in the opposite direction, thereby cancelling each other out and reducing the total effect to zero. Indeed, we found that psychoanalytic therapy had an indirect effect on long-term outcome through psychoanalytic technique but not through number of sessions. Thus, our data were at least partially in line with the hypothesis that the sustained change induced by psychoanalytic therapy was due to psychoanalytic technique and not due to a higher number of sessions. However, it should be noted that we found specific indirect effects of psychoanalytic therapy on post-treatment interpersonal problems and post-treatment introject transmitted by dose (not shown in Table 5). Thus, the advantage of psychoanalytic therapy

Table 4. Predicting outcome and stability of outcome (Path b)

		BDI		IIP-C		INTREX	
		Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Fixed effects, intercept							
Mean post-treatment status[†]	γ_{00}	6.781*** (1.117)	5.610*** (1.375)	1.120*** (0.092)	1.345*** (0.124)	29.823* (13.735)	3.273 (15.271)
Pre-treatment score[‡]	γ_{01}	0.327* (0.132)	0.346* (0.131)	0.803*** (0.101)	0.798*** (0.097)	0.638*** (0.106)	0.610*** (0.098)
Age[‡]	γ_{02}	−0.043 (0.115)	−0.040 (0.122)	−0.006 (0.008)	−0.003 (0.008)	3.337** (0.988)	3.385** (0.959)
CBT (vs PAT)	γ_{03}	1.842 (1.937)	3.751 (2.583)	0.403** (0.124)	0.008 (0.198)	−42.577* (17.597)	1.256 (25.444)
PDT (vs PAT)	γ_{04}	−0.079 (1.676)	1.540 (2.136)	0.166 (0.126)	−0.129 (0.177)	−37.819* (18.264)	0.445 (22.847)
Dose[‡]	γ_{05}		1.017 (0.988)		−0.161* (0.076)		25.763* (10.587)
Psychoanalytic technique[‡]	γ_{06}		−0.271 (6.866)		−0.611 (0.446)		−43.286 (50.279)
Fixed effects, slope							
Mean rate of change[†]	γ_{10}	−0.667* (0.313)	0.361 (0.481)	−0.059** (0.021)	−0.040 (0.025)	6.616* (3.181)	8.140 (4.954)
Pre-treatment score[‡]	γ_{11}	−0.039 (0.053)	−0.058 (0.052)	−0.009 (0.033)	−0.009 (0.034)	−0.073* (0.035)	−0.067* (0.033)
Age[‡]	γ_{12}	0.023 (0.045)	0.033 (0.045)	0.001 (0.002)	0.001 (0.003)	−0.500 (0.359)	−0.610[#] (0.354)
CBT (vs PAT)	γ_{13}	1.576[#] (0.935)	−0.209 (1.114)	0.057* (0.028)	0.027 (0.042)	−6.839 (5.258)	−8.491 (8.611)
PDT (vs PAT)	γ_{14}	1.321* (0.554)	0.039 (0.722)	0.039 (0.043)	0.013 (0.045)	0.876 (5.819)	−2.350 (6.854)
Dose[‡]	γ_{15}		−0.595 (0.361)		−0.016 (0.019)		−3.371 (2.868)
Psychoanalytic technique[‡]	γ_{16}		−4.184** (1.554)		0.043 (0.132)		38.895* (17.049)

Models with BDI were based on 276 measurement points, models with IIP-C on 270 and models with INTREX on 267. Fixed effects are unstandardized regression coefficients with the respective robust standard errors in brackets. All models were fit with HLM 6.08 (Scientific Software International, Inc.) using restricted maximum likelihood estimation. Model 1 = conditional model with treatment effects and covariates. Model 2 = final conditional model with mediators. Dose = number of sessions/100. Psychoanalytic technique = average Fisher-z transformed profile correlations with the psychoanalytic Psychotherapy Process Q-Set prototype. CBT = cognitive–behavioural therapy. PAT = psychoanalytic therapy. PDT = psychodynamic therapy. BDI = Beck Depression Inventory. IIP-C = Inventory of Interpersonal Problems—Circumplex. INTREX = introject affiliation at worst.
[†]Represents the estimate for patients receiving psychoanalytic therapy.
[‡]Grand mean centred.
[#]$p < 0.10$,
*$p < 0.05$,
**$p < 0.01$,
***$p < 0.001$.

Table 5.   Relative specific indirect effects transmitting the effect of psychoanalytic therapy to long-term outcome

	Psychoanalytic therapy versus CBT			Psychoanalytic versus psychodynamic therapy		
	Path a (SE)	Path b (SE)	ab [95% CI]	Path a (SE)	Path b (SE)	ab [95% CI]
BDI as outcome						
PAT → dose → slope	1.931 (0.186)	−0.595 (0.361)	−1.149 [−2.572, 0.216]	1.588 (0.207)	−0.595 (0.361)	−0.945 [−2.157, 0.181]
PAT → technique → slope	0.149 (0.031)	−4.184 (1.554)	−**0.623** [−**1.207**, −**0.153**]	0.072 (0.035)	−4.184 (1.554)	−**0.301** [−**0.740**, −**0.004**]
IIP as outcome						
PAT → dose → slope	1.923 (0.188)	−0.016 (0.019)	−0.031 [−0.104, 0.041]	1.576 (0.217)	−0.016 (0.019)	−0.025 [−0.087, 0.034]
PAT → technique → slope	0.148 (0.031)	0.043 (0.132)	0.006 [−0.033, 0.047]	0.072 (0.034)	0.043 (0.132)	0.003 [−0.018, 0.027]
INTREX as outcome						
PAT → dose → slope	1.933 (0.186)	−3.371 (2.868)	−6.516 [−17.622, 4.406]	1.596 (0.210)	−3.371 (2.868)	−5.380 [−14.895, 3.513]
PAT → technique → slope	0.147 (0.031)	38.895 (17.049)	**5.718** [**0.737**, **11.865**]	0.070 (0.037)	38.895 (17.049)	2.723 [−0.231, 7.294]

Coefficients of Path a equal −B and SE of the β_{03}, β_{13}, β_{04} and β_{14} parameters in Table 3. We reversed the sign of these coefficients to clarify that they represent *increases* in mediating variables due to psychoanalytic therapy (as compared with control conditions). Coefficients of Path b equal B and SE of the γ_{15} and γ_{16} parameters in Table 4. Ninety-five per cent confidence intervals for the product of a and b were computed with the Monte Carlo method using 100 000 resamples. Significant products of a and b are printed in bold. PAT = psychoanalytic therapy. Dose = number of sessions/100. Technique = average Fisher-z transformed profile correlations with the psychoanalytic Psychotherapy Process Q-Set prototype. Slope = rate of change per year during follow-up. BDI = Beck Depression Inventory. IIP-C = Inventory of Interpersonal Problems—Circumplex. INTREX = introject affiliation at worst.

as compared with CBT in terms of post-treatment interpersonal problems and introject may be primarily due to the higher dose.[9]

Explaining Outcome Differences between Psychoanalytic and Psychodynamic Therapies

An important limitation of the mediation analyses presented above is that participants were not randomly assigned to psychoanalytic therapy versus CBT. Thus, we repeated the mediation analyses using psychodynamic therapy as the control condition to ensure full randomization of the independent variable (Huber *et al.*, 2013). Regarding Path *a*, Table 3 shows that psychoanalytic therapy comprised a considerably higher number of sessions than psychodynamic therapy (β_{04}) and psychoanalytic interventions were more typical for psychoanalytic therapy than for psychodynamic therapy (β_{14}; with the limitation that the latter difference was only marginally significant when pre-treatment introject affiliation was controlled for). Results for Path *b* in Table 4 were identical to the results presented above, as these paths are the same irrespective of the contrast used in the multicategorical independent variable (Figure 1). Moreover, the direct effects of psychoanalytic therapy again were not significant (γ_{04} and γ_{14}), suggesting that the mediating variables were successful at explaining the total effects. Finally, the 95% Monte Carlo CIs for the indirect effects shown in the last column of Table 5 suggest that psychoanalytic technique mediated the differential long-term effect of psychoanalytic therapy on depressive symptoms. The remaining indirect effects were not significant.

Exploratory Item-Level Analyses of the Indirect Effect on Depressive Symptoms

After determining that the psychoanalytic techniques mediated the differential long-term effect of psychoanalytic therapy on depressive symptoms, we needed to determine *which* of the prototypical psychoanalytic techniques were responsible for this finding. Thus, we conducted exploratory mediation analyses at the PQS item

level to 'unpack' the indirect effect of the PA prototype. Specifically, we reran the mediation analyses 40 times, each time replacing the PA prototype score with one of the 20 most characteristic and 20 most uncharacteristic PQS items (Ablon & Jones, 1998). This is an appropriate exploratory strategy as the PA prototype score is essentially a weighted average of all 100 PQS items with higher (absolute) weights for items that are more salient (i.e., characteristic or uncharacteristic). Three PQS items describing typical features of psychoanalytic therapies predicted symptom reduction after therapy (Path *b*). These items referred to discussing sexual feelings and experiences (Item 11), $B = -0.54$, $SE = 0.24$, patients' dreams or fantasies (Item 90), $B = -0.34$, $SE = 0.17$, and memories or reconstructions from infancy and childhood (Item 91), $B = -0.36$, $SE = 0.16$, all p's < 0.05. In addition, the last two significantly mediated the relative effect of psychoanalytic therapy (as compared with CBT) on long-term outcome, with $ab = -0.45$, 95% CI $[-1.09, -0.01]$, for dreams or fantasies, and $ab = -0.48$, 95% CI $[-1.08, -0.05]$, for memories from infancy and childhood. PQS items describing uncharacteristic features of psychoanalytic therapies did not predict change after therapy, nor did they mediate the effect of psychoanalytic therapy.

DISCUSSION

In this study, we tested whether the differential long-term effect of psychoanalytic therapy (i.e., high-dose LTPP) reported by Huber, Zimmermann, *et al.* (2012) and Huber *et al.* (2013) would be mediated by the number of sessions and/or by the features of the respective psychoanalytic technique. We found partial support for the mediating effect of psychoanalytic technique: psychoanalytic therapy predicted a more pronounced application of psychoanalytic techniques, which in turn predicted more favourable trajectories of depressive symptoms during the 3-year follow-up period. Exploratory item analyses suggested that the effect on depressive symptoms was primarily driven by the therapist's exploration of the patient's fantasy life and discussions of the patient's early memories. In addition, there was some indication for a similar indirect effect on the improvement of introject affiliation during follow-up, albeit this effect was significant only when using CBT as the comparison group. Moreover, we also found support for a mediating effect of dose on outcome: psychoanalytic therapy was associated with a strikingly higher number of sessions, which in turn predicted fewer interpersonal problems and more affiliative introjects directly after treatment. Thus, our findings were in line with the prediction that *both* psychoanalytic techniques and a higher dose would be involved in establishing the differential effectiveness of psychoanalytic therapy: whereas the higher dose seems to be

---

[9]For the sake of completeness, we also analysed differences between psychoanalytic therapy and CBT in cognitive–behavioural technique (Path *a*) and included the CBT prototype as a Level-2 predictor in Equation 2 (Path *b*). Results for Path *a* suggested that cognitive–behavioural technique was more salient in CBT sessions than in psychoanalytic therapy sessions, $B = 0.23$, $SE = 0.03$, $p < 0.001$. Results for Path *b* suggested that the application of cognitive–behavioural technique was *positively* associated with post-treatment depressive symptoms, $B = 13.38$, $SE = 6.40$, $p < 0.05$, but unrelated to long-term outcome and other outcome measures. Note that controlling for cognitive–behavioural technique in Equation 2 did not substantially change the results of the effects of the other mediating variables.

responsible for the fact that psychoanalytic therapy is effective in helping patients to reduce their interpersonal problems and improve their self-love during treatment, psychoanalytic techniques such as explorations of patients' fantasy lives and discussions of patients' early memories seem to facilitate sustained change after therapy.

Our findings regarding the positive effect of psychoanalytic technique on psychotherapeutic outcome are in line with a number of previous process–outcome studies that focused on short-term treatments for depression (Ablon & Jones, 1998; Gaston *et al.*, 1998; Hilsenroth *et al.*, 2003). However, our findings extend such previous studies in several ways: first, these previous studies assessed the association between psychodynamic–interpersonal or psychoanalytic technique and outcome *within* specific treatments and did not test for the mediating role of these techniques in facilitating the *differential* effectiveness of treatments as we did. Thus, our study represents a major step forward according to current recommendations for research on psychotherapeutic processes (Kazdin, 2007). Second, in the current study, psychoanalytic techniques were assessed using three separate sessions per treatment, which clearly improved the reliability and representativeness of process measurement as compared with assessments using only a single session per treatment. Third, previous studies focused on the immediate effects on psychotherapeutic outcome, whereas our study is the first to include assessments during a 3-year follow-up period. Finally, our findings show that psychoanalytic techniques are also relevant in *long-term* treatments, even when controlling for the higher number of sessions. This has important implications for interpreting the growing evidence on the effectiveness of LTPP (de Maat *et al.*, 2013; Leichsenring & Rabung, 2008, 2011; Leichsenring, Abbass, *et al.* 2013; Smit *et al.*, 2012). Our study provides the first evidence that intensive psychodynamic treatments such as psychoanalytic therapy are effective not only because they are *intensive* but also because they are *psychoanalytic*.

The exploratory findings on the PQS item level should be interpreted with caution as the specific pattern of results may have been due to chance. Nevertheless, it seems striking that Slavin-Mulford *et al*. (2011) identified very similar items as relevant for significant clinical change, namely focusing on wishes, fantasies, dreams and early memories. The common denominator of these items seems to be that they do not represent therapist interventions in a strict sense but rather the *contents* of the sessions. From a methodological point of view, this could be due to the fact that ratings of content are more reliable than ratings of procedural aspects. A more clinical explanation would be that psychoanalytic therapies provide time, space and an 'interpsychic' dimension (Bolognini, 2004) for reverie and containment so that patients are more likely to say things that are hard to say

and that are almost never said to anybody else. In turn, verbalizing one's own dreams, fantasies and early memories might help a person to reorganize maladaptive representations of oneself and others and lead to sustained change even after treatment termination. Of course, this interpretation remains speculative. Further studies are needed to replicate the relevance of these specific techniques, and, even more important, to explore *how* they produce sustained change in patients.

Another implication of our findings is that dose and technique have different effects on different outcomes: whereas improvements in depression and hostility towards the self *after* treatment were related to psychoanalytic technique, improvements in interpersonal problems and hostility towards the self *during* treatment were linked to the number of sessions. The former finding suggests that sustained therapeutic change may depend, at least to some extent, on the application of specific strategies that will foster change in the underpinning intrapsychic structures (e.g., the development of a 'self-analytic function'; Falkenström, Grant, Broberg, & Sandell, 2007) that will remain stable even when the therapist is not actually present. The latter finding suggests that changes in interpersonal problems and self-acceptance may simply require that enough time be spent in a positive and caring therapeutic relationship. This latter finding is also in line with the meta-analysis by Leichsenring and Rabung (2011) who reported that treatment duration was more highly correlated with social functioning than with psychiatric symptoms, and with dose–response studies reporting that recovery from acute distress typically evolves more quickly than recovery from impairments in social or personality functioning (e.g., Kopta *et al.*, 1994).

The present study has several limitations. First, neither the treatment nor the mediator variables were fully randomized, and thus, causal inferences are questionable (cf. Bullock, Green, & Ha, 2010; Imai, Keele, & Tingley, 2010). That is, we cannot rule out the possibility that our findings were influenced or biased by other variables that were not included in our statistical models (e.g., therapeutic alliance, therapist competence or early response). However, patients were at least fully randomized to psychoanalytic versus psychodynamic therapy, suggesting that the internal validity of the effects pertaining to these analyses is somewhat higher. Moreover, predicting changes *after* treatment clearly ensured that treatment allocation, mediators and outcome assessment followed each other in time (i.e., effects of changes *after* treatment on mediators were causally impossible). This suggests that the reported effects of psychoanalytic technique on outcome during follow-up are methodologically more convincing than the effects of dose on outcome at treatment termination, as the latter effects may also work the other way around (e.g., therapists might prefer to

continue therapy with patients who have reduced inter-personal problems because they regard these sessions as more 'comfortable').[10]

Second, the use of middle sessions for technique ratings has drawbacks. One issue is that the application of techniques in middle sessions might be influenced by prior symptom change. For example, one might argue that in therapies with patients who show an early response, it is easier for therapists to conduct psychoanalytic interventions, and thus, the association between psychoanalytic technique and long-term outcome might be spurious due to the influence of third variables that are responsible for the early response. However, from a conceptual perspective, this argument would also apply if early sessions were used for the technique ratings as only the *randomization* of technique warrants causal inferences (e.g., Høglend *et al.*, 2006). From an empirical perspective, this interpretation seems rather unlikely because if the application of psychoanalytic technique were to be associated with changes in outcome measures during the first half of the treatment, one would also expect that it would be associated with changes during the *full* treatment, and this was apparently not the case (i.e., the coefficients for γ_{06} were generally not significant). A further issue regarding the use of middle sessions is that the (arithmetic) middle varies across treatments and is completely confounded with dose. For example, in CBT, technique was usually assessed in the 25th session, whereas in psychoanalytic therapy, it was, on average, assessed in the 120th session. Given that patients are more likely to bring intimate content to session 120 than to session 25, our measure of psychoanalytic technique might simply be a measure of the 'depth' or 'progress' of treatment and not of the psychoanalytic technique *per se*. However, if this alternative interpretation were valid, one would expect higher PA prototype scores in middle sessions that occur later (e.g., in the 120th as compared with the 25th session) irrespective of the specific treatment modality. In other words, when considering sessions from the three treatment conditions separately, the session numbers of the middle sessions in which psychoanalytic technique was assessed (i.e., half of the dose) should be positively correlated with the actual amount of psychoanalytic technique administered. Obviously, this was not the case, as dose and technique were uncorrelated when controlling for treatment condition. In any case, further investigations of a broader and more balanced sample of sessions from the MPS is clearly needed and currently underway (e.g., early sessions after a fixed number of sessions or sessions with 'significant events' based on therapists' process ratings).

Third, the naturalistic setting of this study poses further threats to the validity of our conclusions. For example, due to the lack of manuals and quality checks, we cannot be sure that therapists applied the techniques equally *competently* in the different treatment conditions. Moreover, although our findings suggest that treatment adherence was adequate (e.g., the application of psychoanalytic technique was most salient in the psychoanalytic therapy sessions), the PA prototype scores were generally lower than in former studies (Ablon & Jones, 2005). One explanation for this could be that the therapists in the MPS who delivered the psychoanalytic and psychodynamic treatments adhered less stringently to the principles of psychoanalytic therapy than their American colleagues in the studies analysed by Ablon and Jones (1998, 2005). Another explanation could be that raters, as they had no psychotherapeutic expertise and showed rather modest inter-rater reliability, might have systematically overlooked the application of some psychoanalytic techniques. Obviously, further research is needed to investigate the effects of psychoanalytic techniques on outcome using highly controlled efficacy designs.

Fourth, the majority of authors involved in conducting this study had an allegiance to psychoanalytic therapy (e.g., according to prior publications, clinical training and professional affiliations). As researcher allegiance carries a risk of bias in psychotherapy research (Munder *et al.*, 2013), we cannot rule out that this kind of bias influenced our results. Fifth, sample size was probably sufficient only for detecting indirect effects of a medium effect size (Fritz & MacKinnon, 2007). For example, dose might indeed have a small effect on long-term change in depressive symptoms, as the respective effect γ_{15} just missed statistical significance, with $p = 0.10$. Finally, outcome was assessed using self-report questionnaires, and technique was assessed using observer reports. Additional observer-rated outcome and patient-rated process variables would have provided a more holistic and in-depth view into ongoing changes (Löffler-Stastka, 2011).

Despite these limitations, the present study provides an important step towards empirically unravelling the effectiveness of LTPP. Our results tentatively suggest that

---

[10]It should be noted that a causal interpretation of the mediating effect of dose could also be questioned on conceptual grounds. One assumption of causal mediation analysis is that the treatment must be independent of all potential values of the mediating variable (i.e., that each treatment in theory can receive any level of the mediator; Imai *et al.*, 2010). This assumption might not hold for number of sessions as treatments such as 'low-dose psychoanalytic therapy' or 'high-dose CBT' might seem conceptually unreasonable. In other words, number of sessions might be conceived of as a defining feature of the treatments as opposed to an intermediate variable that is manipulated by the treatments. However, although patients received, on average, strikingly higher numbers of sessions in psychoanalytic therapy than in psychodynamic therapy and CBT, the distributions of the three groups clearly overlapped. That is, from an empirical perspective, number of sessions cannot be simply regarded as a proxy for treatment. Moreover, even when one disregards dose as a potential causal mediator, our main finding that psychoanalytic techniques predict long-term outcome above and beyond dose would still be valid.

psychoanalytic techniques play a more prominent role in establishing sustained changes in patients with major depression than has been previously thought. That is, intensive psychodynamic treatments such as psychoanalytic therapy seem to be effective not only because they are *intensive* but also because they are *psychoanalytic*. We are aware of the fact that this conclusion is highly preliminary and that further studies replicating our findings are urgently needed. In this regard, we hope that our study will encourage researchers to investigate psychotherapeutic processes in long-term treatments and to gauge whether their effects outweigh their higher costs across long-term follow-up periods (e.g., Benecke *et al.*, 2014; Beutel *et al.*, 2012). Although such studies are expensive, time-consuming and at odds with the current publish-or-perish practice, they may be the only way to empirically address some of the most troubling questions of our field: the how and when of sustained therapeutic change.

ACKNOWLEDGEMENTS

REFERENCES

Ablon, J. S., & Jones, E. E. (1998). How expert clinicians' prototypes of an ideal treatment correlate with outcome in psychodynamic and cognitive–behavior therapy. *Psychotherapy Research, 8*, 71–83.

Ablon, J. S., & Jones, E. E. (2002). Validity of controlled clinical trials of psychotherapy: Findings from the NIMH Treatment of Depression Collaborative Research Program. *American Journal of Psychiatry, 159*, 775–783.

Ablon, J. S., & Jones, E. E. (2005). On analytic process. *Journal of the American Psychoanalytic Association, 53*, 541–568.

Ablon, J. S., Levy, R. A., & Katzenstein, T. (2006). Beyond brand names of psychotherapy: Identifying empirically supported change processes. *Psychotherapy: Theory, Research, Practice, Training, 43*, 216–231.

Albani, C., Blaser, G., Jacobs, U., Jones, E., Geyer, M., & Kächele, H. (2000). Die Methode des 'Psychotherapie-Prozeß Q-Sort' [The Psychotherapy Process Q-Sort method]. *Zeitschrift für Klinische Psychologie, Psychiatrie und Psychotherapie, 48*, 151–171.

Alden, L. E., Wiggins, J. S., & Pincus, A. L. (1990). Construction of circumplex scales for the Inventory of Interpersonal Problems. *Journal of Personality Assessment, 55*, 521–536.

Anderson, E. M., & Lambert, M. J. (2001). A survival analysis of clinically significant change in outpatient psychotherapy. *Journal of Clinical Psychology, 57*, 875–888.

Barkham, M., Rees, A., Stiles, W. B., Shapiro, D. A., Hardy, G. E., & Reynolds, S. (1996). Dose–effect relations in time-limited psychotherapy for depression. *Journal of Consulting and Clinical Psychology, 64*, 927–935.

Beck, A. T., Steer, R. A. & Garbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8*, 77–100.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561–571.

Bedics, J. D., Atkins, D. C., Comtois, K. A., & Linehan, M. M. (2012). Treatment differences in the therapeutic relationship and introject during a 2-year randomized controlled trial of dialectical behavior therapy versus nonbehavioral psychotherapy experts for borderline personality disorder. *Journal of Consulting and Clinical Psychology, 80*, 66–77.

Beenen, F., & Stoker, J. (1996). *Periodical rating scale for psychoanalytic treatment*. Amsterdam: Netherlands Psychoanalytic Institute.

Benecke, C., Huber, D., Staats, H., Zimmermann, J., Deserno, H., Wiegand-Grefe, S., & Schauenburg, H. (2014). The APS study: A comparison of psychoanalytic therapy and cognitive-behavior therapy for anxiety and personality disorders. Presentation of the RCT study design. Manuscript in preparation.

Benjamin, L. S. (1974). Structural analysis of social behavior. *Psychological Review, 81*, 392–425.

Benjamin, L. S. (1983). The INTREX user's manual. Part I and II. Intrex Interpersonal Institute, Inc., P.O. Box 55218, Madison, WI 53705, Madison.

Beutel, M. E., Leuzinger-Bohleber, M., Rüger, B., Bahrke, U., Negele, A., Haselbacher, A., … Hautzinger, M. (2012). Psychoanalytic and cognitive–behavior therapy of chronic depression: study protocol for a randomized controlled trial. *Trials, 13*, 117.

Blagys, M. D., & Hilsenroth, M. J. (2000). Distinctive feature of short-term psychodynamic–interpersonal psychotherapy: A review of the comparative psychotherapy process literature. *Clinical Psychology: Science and Practice, 7*, 167–188.

Bolognini, S. (2004). Intrapsychic–interpsychic. *International Journal of Psychoanalysis, 85*, 337–357.

Bullock, J. G., Green, D. P., & Ha, S. E. (2010). Yes, but what's the mechanism? (Don't expect an easy answer). *Journal of Personality and Social Psychology, 98*, 550–558.

Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment, 6*, 284–290.

Cuijpers, P., van Straten, A., Andersson, G., & van Oppen, P. (2008). Psychotherapy for depression in adults: A meta-analysis of comparative outcome studies. *Journal of Consulting and Clinical Psychology, 76*, 909–922.

de Maat, S., de Jonghe, F., de Kraker, R., Leichsenring, F., Abbass, A., Luyten, P., … Dekker, J. (2013). The current state of the empirical evidence for psychoanalysis: A meta-analytic approach. *Harvard Review of Psychiatry, 21*, 107–137.

Dekker, J., Molenaar, P. J., Kool, S., van Aalst, G., Peen, J., & Jonghe, F. de. (2005). Dose–effect relations in time-limited combined psycho-pharmacological treatment for depression. *Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences, 35*, 47–58.

Driessen, E., Cuijpers, P., Maat, S. C. de, Abbass, A. A., Jonghe, F. de, & Dekker, J. J. (2010). The efficacy of short-term psychodynamic psychotherapy for depression: A meta-analysis. *Clinical Psychology Review, 30*, 25–36.

Falkenström, F., Grant, J., Broberg, J., & Sandell, R. (2007). Self-analysis and post-termination improvement after psychoanalysis and long-term psychotherapy. *Journal of the American Psychoanalytic Association, 55*, 629–674.

Fonagy, P., & Kächele, H. (2009). Psychoanalysis and other long-term dynamic psychotherapies. In M.-G. Gelder, J. J. Lopez-Ibor, & N. Andreasen (Eds.), *New Oxford textbook of psychiatry* (vol. 2, pp. 1337–1349). Oxford: Oxford University Press.

Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science, 18*, 233–239.

Gabbard, G. O. (2004). *Long-term psychodynamic psychotherapy.* Washington, DC: American Psychiatric Publishing.

Gabbard, G. O., & Horowitz, M. J. (2009). Insight, transference interpretation, and therapeutic change in the dynamic psychotherapy of borderline personality disorder. *American Journal of Psychiatry, 166*, 517–521.

Gaston, L., Thompson, L., Gallagher, D., Cournoyer, L.-G., & Gagnon, R. (1998). Alliance, technique, and their interactions in predicting outcome of behavioral, cognitive, and brief dynamic therapy. *Psychotherapy Research, 8*, 190–209.

Gerber, A. J., Kocsis, J. H., Milrod, B. L., Roose, S. P., Barber, J. P., Thase, M. E., … Leon, A. C. (2011). A quality-based review of randomized controlled trials of psychodynamic psychotherapy. *American Journal of Psychiatry, 168*, 19–28.

Gibbons, M. B. C., Crits-Christoph, P., & Hearon, B. (2008). The empirical status of psychodynamic therapies. *Annual Review of Clinical Psychology, 4*, 93–108.

Hautzinger, M., Bailer, M., Worall, H., & Keller, F. (1995). *Beck-Depressions-Inventar (BDI): Testhandbuch* (2. Aufl.) [Beck Depression Inventory]. Bern: Hans Huber.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*, 408–420.

Hayes, A. F., & Preacher, K. J. (2011). Indirect and direct effects of a multicategorical causal agent in statistical mediation analysis. Unpublished manuscript.

Henry, W. P., Strupp, H. H., Schacht, T. E., & Gaston, L. (1994). Psychodynamic approaches. In A. E. Bergin & S. L. Garfield (Eds.), *Handbook of psychotherapy and behavior change* (pp. 467–508). New York: Wiley.

Hilsenroth, M. J., Ackerman, S. J., Blagys, M. D., Baity, M. R., & Mooney, M. A. (2003). Short-term psychodynamic psychotherapy for depression: An examination of statistical, clinically significant, and technique-specific change. *Journal of Nervous and Mental Disease, 191*, 349–357.

Hilsenroth, M., Blagys, M., Ackerman, S., Bonge, D., & Blais, M. (2005). Measuring psychodynamic–interpersonal and cognitive–behavioral techniques: Development of the Comparative Psychotherapy Process Scale. *Psychotherapy, 42*, 340–356.

Høglend, P., Amlo, S., Marble, A., Bøgwald, K.-P., Sørbye, O., Sjaastad, M. C., & Heyerdahl, O. (2006). Analysis of the patient–therapist relationship in dynamic psychotherapy: An experimental study of transference interpretations. *American Journal of Psychiatry, 163*, 1739–1746.

Hollon, S. D., & Beck, A. T. (2004). Cognitive and cognitive behavioral therapies. In M. J. Lambert (Ed.), *Bergin and Garfield's handbook of psychotherapy research und behavior change* (5th ed., pp. 447–492). New York: Wiley.

Horowitz, L. M., Strauß, B., Kordy, H. (2000): *Inventar zur Erfassung Interpersoneller Probleme* [Inventory of Interpersonal Problems]. Weinheim: Beltz.

Howard, K. I., Kopta, S. M., Krause, M. S., & Orlinsky, D. E. (1986). The dose–effect relationship in psychotherapy. *American Psychologist, 41*, 159–164.

Huber, D., Henrich, G., Clarkin, J., & Klug, G. (2013). Psychoanalytic versus psychodynamic therapy for depression: A three-year follow-up study. *Psychiatry, 76*, 132–149.

Huber, D., Henrich, G., Gastner, J., & Klug, G. (2012). Must all have prices? The Munich psychotherapy study. In: R. A. Levy, J. S. Ablon, & H. Kächele (Eds.), *Psychodynamic psychotherapy research. Evidence-based practice and practice-based evidence* (pp. 51–69). New York: Humana Press.

Huber, D., Zimmermann, J., Henrich, G., & Klug, G. (2012). Comparison of cognitive–behaviour therapy with psychoanalytic and psychodynamic therapy for depressed patients: A three-year follow-up study. *Zeitschrift für Psychosomatische Medizin und Psychotherapie, 58*, 299–316.

Hughes, J., & Barkham, M. (2005). Scoping the Inventory of Interpersonal Problems, its derivations and short forms: 1988–2004. *Clinical Psychology and Psychotherapy, 12*, 475–496.

Imai, K., Keele, L., & Tingley, D. (2010). A general approach to causal mediation analysis. *Psychological Methods, 15*, 309–334.

Jones, E. E. (1985). Manual for the psychotherapy Q sort. Unpublished manuscript, University of California, Berkeley.

Jones, E. E., & Pulos, S. M. (1993). Comparing the process in psychodynamic and cognitive–behavioral therapies. *Journal of Consulting and Clinical Psychology, 61*, 306–316.

Jones, E. E., Cumming, J. D., & Horowitz, M. J. (1988). Another look at the nonspecific hypothesis of therapeutic effectiveness. *Journal of Consulting and Clinical Psychology, 56*, 48–55.

Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology, 3*, 1–17.

Kopta, S. M., Howard, K. I., Lowry, J. L., & Beutler, L. E. (1994). Patterns of symptomatic recovery in psychotherapy. *Journal of Consulting and Clinical Psychology, 62*, 1009–1016.

Krause, R. (2009). Psychodynamische Intervention [Psychodynamic intervention]. In: M. Hautzinger, & P. Pauli (Eds.), *Psychotherapeutische Methoden* (pp. 161–221). Göttingen: Hogrefe.

Krull, J. L., & MacKinnon, D. P. (2001). Multilevel modeling of individual and group level mediated effects. *Multivariate Behavioral Research, 36*, 249–277.

Lambert, M. J., & Ogles, B. M. (2004). The efficacy and effectiveness of psychotherapy. In M. J. Lambert (Ed.), *Bergin and Garfield's handbook of psychotherapy and behavior change* (5th ed., pp. 139–193). New York: Wiley.

Lambert, M. J., Hansen, N. B., & Finch, A. E. (2001). Patient-focused research: Using patient outcome data to enhance treatment effects. *Journal of Consulting and Clinical Psychology, 69*, 159–172.

Leichsenring, F. (2001). Comparative effects of short-term psychodynamic psychotherapy and cognitive–behavioral therapy in depression. *Clinical Psychology Review, 21*, 401–419.

Leichsenring, F., Abbass, A., Luyten, P., Hilsenroth, M., & Rabung, S. (2013). The emerging evidence for long-term psychodynamic therapy. *Psychodynamic Psychiatry, 41*, 361–384.

Leichsenring, F., & Rabung, S. (2008). Effectiveness of long-term psychodynamic psychotherapy: A meta-analysis. *JAMA, the Journal of the American Medical Association, 300*, 1551–1565.

Leichsenring, F., & Rabung, S. (2011). Long-term psychodynamic psychotherapy in complex mental disorders: Update of a meta-analysis. *British Journal of Psychiatry, 199*, 15–22.

Leichsenring, F., Salzer, S., Beutel, M. E., Herpertz, S., Hiller, W., Hoyer, J., … Leibing, E. (2013). Psychodynamic therapy and cognitive–behavioral therapy in social anxiety disorder: A multicenter randomized controlled trial. *American Journal of Psychiatry, 170*, 759–767.

Löffler-Stastka, H. (2011). Q-sort-Methoden in Diagnostik und Therapieverlaufsbeobachtung [Use of Q-sort assessment methods for diagnostic purposes and in treatment evaluation]. *Zeitschrift für Psychosomatische Medizin und Psychotherapie, 57*, 319–324.

Long, J. S., & Ervin, L. H. (2000). Using heteroscedasticity consistent standard errors in the linear regression model. *The American Statistician, 54*, 217–224.

MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. New York, NY: Erlbaum.

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*, 41–62.

Monsen, J. T., von der Lippe, A. L., Havik, O. E., Halvorsen, M. S., & Eilertsen, D. E. (2007). Validation of the SASB Introject Surface in a Norwegian clinical and nonclinical sample. *Journal of Personality Assessment, 88*, 235–245.

Munder, T., Brütsch, O., Leonhart, R., Gerger, H., & Barth, J. (2013). Researcher allegiance in psychotherapy outcome research: An overview of reviews. *Clinical Psychology Review, 33*, 501–511.

Owen, J., & Hilsenroth, M. J. (2011). Interaction between alliance and technique in predicting patient outcome during psychodynamic psychotherapy. *Journal of Nervous and Mental Disease, 199*, 384–389.

Pincus, A. L., Gurtman, M. B., & Ruiz, M. A. (1998). Structural Analysis of Social Behavior (SASB): Circumplex analyses and structural relations with the interpersonal circle and five-factor model of personality. *Journal of Personality and Social Psychology, 74*, 1629–1645.

Pincus, A. L., Newes, S. L., Dickinson, K. A., & Ruiz, M. A. (1998). A comparison of three indexes to assess the dimensions of Structural Analysis of Social Behavior. *Journal of Personality Assessment, 70*, 145–170.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*, 717–731.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891.

Preacher, K. J., & Selig, J. P. (2012). Advantages of Monte Carlo confidence intervals for indirect effects. *Communication Methods and Measures, 6*, 77–98.

R. Core Team. (2013). R: A language and environment for statistical computing. Vienna: R Foundation for Statistical Computing. Retrieved from http://www.R-project.org.

Rüger, U., Dahm, A., & Kallinke, D. (2003). *Faber Haarstrick Kommentar Psychotherapie-Richtlinien, 6. Aufl.* [The Faber–Haarstrick commentary on psychotherapy guidelines]. München: Urban & Fischer.

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*, 147–177.

Selig, J. P., & Preacher, K. J. (2008). Monte Carlo method for assessing mediation: An interactive tool for creating confidence intervals for indirect effects [Computer software]. Available from http://quantpsy.org/.

Shedler, J. (2010). The efficacy of psychodynamic psychotherapy. *American Psychologist, 65*, 98–109.

Slavin-Mulford, J., Hilsenroth, M., Weinberger, J., & Gold, J. (2011). Therapeutic interventions related to outcome in psychodynamic psychotherapy for anxiety disorder patients. *Journal of Nervous and Mental Disease, 199*, 214–221.

Smit, Y., Huibers, M. J., Ioannidis, J. P., van Dyck, R., van Tilburg, W., & Arntz, A. (2012). The effectiveness of long-term psychoanalytic psychotherapy—A meta-analysis of randomized controlled trials. *Clinical Psychology Review, 32*, 81–92.

Thorpe, K. E., Zwarenstein, M., Oxman, A. D., Treweek, S., Furberg, C. D., Altman, D. G., … Chalkidou, K. (2009). A pragmatic-explanatory continuum indicator summary (PRECIS): A tool to help trial designers. *Journal of Clinical Epidemiology, 62*, 464–475.

Tracey, T. J. G., Rounds, J. B., & Gurtman, M. B. (1996). Examination of the general factor with the interpersonal circumplex structure: Application to the Inventory of Interpersonal Problems. *Multivariate Behavior Research, 31*, 441–466.

Tress, W. (1993). INTREX-Kurzform-Fragebogen: Formulare, Itemformulierungen und Fragestellungen [INTREX short form questionnaire: Forms, item wordings, and questions]. In W. Tress (Ed.), *SASB. Die strukturale Analyse sozialen Verhaltens* (pp. 259–263). Heidelberg: Asange.

Wampold, B. E., & Serlin, R. C. (2000). The consequence of ignoring a nested factor on measures of effect size in analysis of variance. *Psychological Methods, 5*, 425–433.