

Data supplement for Steinert et al., Psychodynamic Therapy: As Efficacious as Other Empiracally Supported Treatments? A Meta-Analysis Testing Equivalence of Outcomes. Am J Psychiatry (doi:10.1176/appi.ajp.2017.17010057)

## **Supplementary web appendix**

### **Psychodynamic therapy: as efficacious as other empirically supported treatments? - A meta-analysis testing equivalence of outcomes**

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## eAppendix A: Equivalence testing

For testing equivalence of outcomes, small differences in effect sizes that are compatible with equivalence must be detectable with a sufficient power. Thus, large sample sizes are required (1). In psychotherapy research, not even one individual study seems to exist that is sufficiently powered ( $\geq 80\%$ ) to demonstrate equivalence or non-inferiority if a small margin of  $d=0.25$  (standardized difference in means) is defined as compatible with equivalence or non-inferiority (1, 2). For a margin of  $d=0.25$ , 2 x 275 patients are required to demonstrate equivalence (2 x 253 for demonstrating non-inferiority) (1). If a slightly larger margin of 0.30 is used, a few studies exist that were sufficiently powered for demonstrating equivalence or non-inferiority (Table 1). For a margin of 0.40 a few more studies exist (Table 1), and again some more studies, if an effect size below 0.50 (i.e.  $\leq 0.49$ ) is used (Table 1). - 0.50 is regarded as a medium effect size. A recent study found more than 100 trials directly comparing two or more forms of psychotherapy in depression, but the largest trial was only sufficiently powered to detect a between-group effect size of  $d=0.42$  (2).

Testing for equivalence deviates in several important aspects from the more usual superiority testing (3). Most importantly, a margin of equivalence  $[\delta]$  has to be defined a priori specifying the maximum difference in outcomes that would still be compatible with equivalence (3, 4). Furthermore, two one-sided tests (TOST) are required instead of the traditional two-sided test in superiority testing. By using TOST, equivalence is established at the  $\alpha$  significance level, if a  $(1-2\alpha)\times 100\%$  equivalence confidence interval for the difference in efficacy is included within the equivalence interval  $[-\delta, \delta]$  (3): "The reason the confidence interval is  $(1-2\alpha)\times 100\%$  and not the usual  $(1-\alpha)\times 100\%$  is because this method is tantamount to performing two one-sided tests. Thus, using a 90% equivalence confidence interval yields a 0.05 significance level for testing equivalence" (3, p. 193). As the hypothesis challenged by the TOST procedure refers to equality, not to a difference, the null and alternative hypothesis of the traditional two-sided test are reversed (3):

$$H1: -\Delta E \leq \Delta \leq \Delta E$$

$$H0: \Delta > \Delta E \text{ or } \Delta < -\Delta E.$$

In equivalence testing, two p-values can be determined via the equivalence z (e.g. for a margin of 0.25):  $z_1=(\text{effect size}+0.25)/\text{standard error}$ ,  $z_2=(\text{effect size}-0.25)/\text{standard error}$ , the larger of the two p-values is displayed (5). The null hypothesis of non-equivalence is rejected and equivalence can be concluded, if the p-value indicates significance – which is equivalent to the 90% confidence interval being completely included in the equivalence interval.

Equivalence testing has not yet been widely implemented in mental health research (6). Usually superiority trials finding "no significant differences" between treatments claim to have shown equivalence, yet when compared directly, the traditional two-sided test and the TOST procedure often yield diverging results (7). Thus, equivalence cannot definitely be concluded from the traditional two-sided test.

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## eAppendix B: Complete references of included studies

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### Major depressive disorder

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**Follow-up:** Kronström, K., Salminen, J.K., Hietala, J., Kajander, J., Vahlberg, T., Markkula, J., Rasi-Hakala, H., Karlsson, H., 2009. Does defense style or psychological mindedness predict treatment response in major depression? *Depression and Anxiety, 26*, 689-695.
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### Social anxiety disorder

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### Generalized anxiety disorder

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### **Cocaine dependence**

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### **Borderline personality disorder**

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### **Avoidant personality disorder**

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## eAppendix C: Details of electronic and manual searches

### i) Main electronic search carried out on March 23<sup>rd</sup> 2016

	PUBMED	PsycINFO	CENTRAL
(((((psychodynamic* or dynamic* or psychoanalytic* or interpretive or expressive or STPP or LTPP)) AND (therapy or therapies or psychotherap* or treatment* or counseling)) AND (study or studies or trial*)) AND (outcome* or result or results or effect* or change*)) AND (psychiat* or mental* or psychol*)) AND (RCT* or compar* or randomi*)	2205	1657	1097
Total hits		4959	
Duplicates		1084	
Hits searched		3875	

### ii) Manual searches in the following publications:

Abbass AA, Hancock JT, Henderson J, Kisely S. Short-term psychodynamic psychotherapies for common mental disorders. *Cochrane Database Syst Rev.* 2006:CD004687.

Barber JP, Muran JC, McCarthy KS, Keefe JR. Research on psychodynamic therapies. In: Lambert MJ, ed. *Bergin and Garfield's Handbook of Psychotherapy and Behavior Change* (6th ed). NY: Wiley;2013:443-494.

Driessen E, Cuijpers P, deMaat SCM, Abbass A, deJonghe F, Dekker JJM. The efficacy of short-term psychodynamic psychotherapy for depression. A meta-analysis. *Clin Psychol Rev.* 2010;30:25-36.

Driessen E, Hegelmaier LM, Abbass AA, et al. The efficacy of short-term psychodynamic psychotherapy for depression: A meta-analysis update. *Clin Psychol Rev.* 2015;42:1-15.

Leichsenring F, Leweke F, Klein S, Steinert C. The Empirical Status of Psychodynamic Psychotherapy - An Update: Bambi's Alive and Kicking. *Psychother Psychosom.* 2015;84:129-148.

Leichsenring F, Luyten P, Hilsenroth MJ, et al. Psychodynamic Therapy Meets Evidence-Based Medicine: A Systematic Review Using Updated Criteria. *Lancet Psychiatry.* 2015;2:648-660.

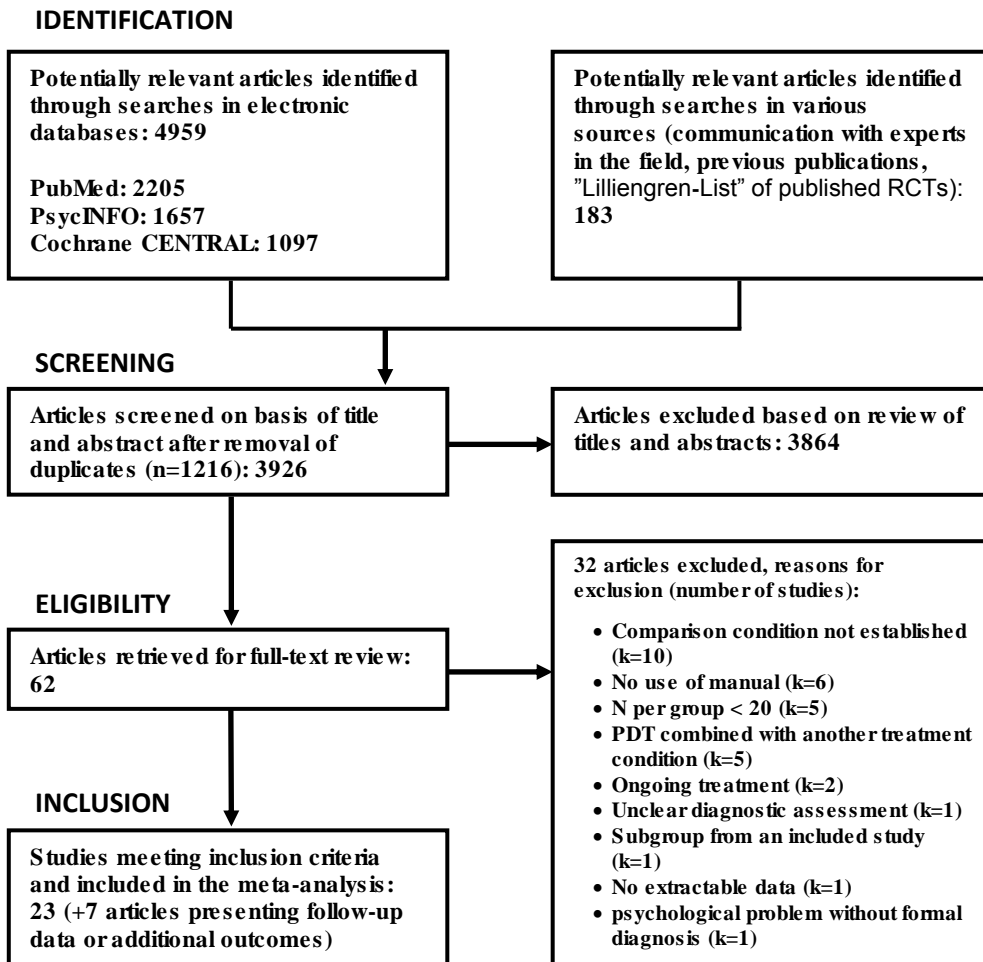
Keefe JR, McCarthy KS, Dinger U, Zilcha-Mano S, Barber JP. A meta-analytic review of psychodynamic therapies for anxiety disorders. *Clin Psychol Rev.* 2014;34:309-323.

plus: search of reference lists of included studies

plus: search in published and regularly updated list ("Lilliengren-List") of all previously identified RCTs on PDT ([http://w3.psychology.su.se/staff/peli/RCTs\\_of\\_PDT.pdf](http://w3.psychology.su.se/staff/peli/RCTs_of_PDT.pdf))

Searches were updated until December 2016

## eAppendix D: Flow-chart: selection process of studies



## eAppendix E: Multilevel Allegiance Rating Scale (MARS)

Study:	Date:
Rate:	

Please rate allegiance for each treatment condition:

<b>MULTILEVEL ALLEGIANCE RATING SCALE - MARS</b>		
<b>LEVEL 1) Researcher allegiance</b>	<b>PDT</b>	<b>COMP</b>
<p><b>1. Author(s) developed treatment (or treatment component)</b></p> <ul style="list-style-type: none"> <li>Code 1 if at least one of the self-quotations is used as support for the treatment description OR the authors explicitly developed the treatment OR have developed a manual for the conduct of the treatment</li> <li>Code 0 if only other researchers are cited or mentioned in the description of the treatment</li> <li>Code unclear (“?”) if no information on the developers of the treatment is available</li> </ul>		
<p><b>2. Author(s) contributed to an etiological understanding of the disorder which matches the treatment</b></p> <ul style="list-style-type: none"> <li>Code 1 if at least one of the passages supported by self-quotations contains a theoretical contribution to an etiological understanding of the disorder based on the same theoretical principles as the treatment OR the authors explicitly state that they have contributed to such an understanding</li> <li>Code 0 if none of the passages supported by self-quotations contains a theoretical contribution to an etiological understanding of the disorder based on the same theoretical principles as the treatment</li> <li>Code unclear (“?”) if none of the above applies</li> </ul>		
<p><b>Code 1</b> if at least one of the above items received a 1 <b>Code 0</b> in all other cases</p>		
<b>LEVEL 2) Therapist allegiance</b>	<b>PDT</b>	<b>COMP</b>
<p><b>1. Therapists therapeutic orientation matches with treatment</b></p> <ul style="list-style-type: none"> <li>Code 1 if it is explicitly stated that the therapeutic orientation of the therapists matches with the applied therapeutic approach OR the therapists had a preference for the applied treatment OR they were experienced in delivering the applied treatment</li> <li>Code 0 if it is explicitly stated that the therapeutic orientation of the therapists does not match with the therapeutic approach</li> <li>Code unclear (“?”) if no information on the therapists’ therapeutic orientation is given OR therapists have only been trained in the approach</li> </ul>		
<p><b>Code 1</b> if a 1 has been assigned <b>Code 0</b> if a 0 or a “?” has been assigned</p>		

<b>LEVEL 3) Trainer allegiance</b>	<b>PDT</b>	<b>COMP</b>
<p><b>1. Author(s) or Expert(s) trained therapists</b></p> <ul style="list-style-type: none"> <li>• Code 1 if one of the authors or an expert other than the author trained therapists in the treatment for which he/she shows an allegiance. Note: author has to be established as an expert. Example: people entitled “treatment experts”, therapists with great experience in the treatment approach; therapists who published about the treatment approach; trainer mentioned with his/her name; “senior advisor”</li> <li>• Code 0 if the therapists were trained by someone else or no training was provided (e.g. therapists were provided treatment manuals for self-training)</li> <li>• Code unclear (“?”) if there is no explicit information on who trained therapists</li> </ul>		
<p><b>Code 1</b> if a 1 has been assigned  <b>Code 0</b> if a 0 or a “?” has been assigned</p>		
<b>LEVEL 4) Supervisor allegiance</b>	<b>PDT</b>	<b>COMP</b>
<p><b>1. Author(s) or Expert(s) supervised therapists</b></p> <ul style="list-style-type: none"> <li>• Code 1 if one of the authors or an expert other than the author supervised therapists in the treatment for which he/she shows an allegiance. Note: author has to be established as an expert. Example: people entitled “treatment experts”, therapists with great experience in the treatment approach; therapists who published about the treatment approach; supervisor mentioned with his/her name; “senior advisor”</li> <li>• Code 0 if supervision was provided but the people involved are not regarded as experts (e.g. therapists provided supervision to each other or saw other supervisors, without details provided about their experience or proficiency) OR no training or supervision was provided</li> <li>• Code unclear (“?”) if no information is given on who provided supervision for therapists</li> </ul>		
<p><b>Code 1</b> if a 1 has been assigned  <b>Code 0</b> if a 0 or a “?” has been assigned</p>		
<b>TOTAL SCORE 1-4 (sum)</b>		
<b>ALLEGIANCE: PDT MINUS COMP (max. -4 to 4)</b>		



## eAppendix F: Assignment of outcome measures to areas of outcome for each study

<b>Study</b>	<b>Outcome measure included in meta-analysis<sup>1</sup></b>	<b>Area of outcome the outcome measure was assigned to</b>
Barber, 2012	HRSD Response	Target symptoms
Connolly-Gibbons, 2016	BASIS-24 means	Target symptoms
	HAM-D means	Target symptoms
	QOLI means	Psychosocial functioning
	SF-36 MCS means	Psychosocial functioning
	SF-36 PCS means	Psychosocial functioning
Cooper, 2003	EPDS means	Target symptoms
	SCID Remission	Target symptoms
Driessen, 2013	HAM-D means	Target symptoms
	IDS-SR means	Target symptoms
Gallagher-Thompson, 1994	BDI means	Target symptoms
	GDS means	Target symptoms
	HRSD means	Target symptoms
	SADS Remission	Target symptoms
Salminen, 2008	BDI means	Target symptoms
	HRSD Remission/means <sup>2</sup>	Target symptoms
	SCID Remission	Target symptoms
	SOFAS means	Psychosocial functioning
Shapiro, 1994	BDI means	Target symptoms
	IIP means	Psychosocial functioning
	SAS social subscale means	General psychiatric symptoms
	SCL-90 DS means	Target symptoms
	SCL-90 R GSI means	General psychiatric symptoms
	Self-esteem	Psychosocial functioning
Thompson, 1987	BDI means	Target symptoms
	BPSR means	General psychiatric symptoms
	BSI Anxiety means	General psychiatric symptoms
	BSI Depression means	Target symptoms
	BSI Global severity means	General psychiatric symptoms
	GAS means	Psychosocial functioning
	GDS means	Target symptoms
	HRSD means	Target symptoms
	SAS means	Psychosocial functioning
	SADS Response	Target symptoms
Bögels, 2014	BAT means	Target symptoms
	Psychopathology Composite means	General psychiatric symptoms
	SA Composite means	Target symptoms
	SPAI being in functional range	Target symptoms
	SPDSC means	Target symptoms
Leichsenring, 2013	BDI means	General psychiatric symptoms
	IIP means	Psychosocial functioning
	LSAS means	Target symptoms
	SPAI means	Target symptoms
Leichsenring, 2009	BAI means	General psychiatric symptoms
	BDI means	General psychiatric symptoms
	HADS - anxiety means	General psychiatric symptoms
	HAM-A means	Target symptoms
	IIP means	Psychosocial functioning
	PSWQ means	Target symptoms
	STAI trait means	General psychiatric symptoms
Leichsenring, 2013	BDI means	General psychiatric symptoms
	IIP means	Psychosocial functioning
	LSAS means	Target symptoms
	SPAI means	Target symptoms

Brom, 1989	DPQ Conceit means	Psychosocial functioning
	DPQ Discontentment means	Psychosocial functioning
	DPQ Dominance means	Psychosocial functioning
	DPQ Inadequacy means	Psychosocial functioning
	DPQ Rigidity means	Psychosocial functioning
	DPQ Self-esteem means	Psychosocial functioning
	DPQ Social inadequacy means	Psychosocial functioning
	IES means	Target symptoms
Garner, 1993	SCL-90 total means	General psychiatric symptoms
	BDI means	General psychiatric symptoms
	Borderline Syndrome Index means	General psychiatric symptoms
	Eating Attitudes Test total means	Target symptoms
	EDE Attitudes toward shape means	Target symptoms
	EDE Attitudes toward weight means	Target symptoms
	EDE Binge eating episodes means	Target symptoms
	EDE Dietary Restraint means	Target symptoms
	EDE Vomiting episodes means	Target symptoms
	EDI Body dissatisfaction	Target symptoms
	EDI Bulimia means	Target symptoms
	EDI Drive for thinness means	Target symptoms
	EDI Ineffectiveness means	Target symptoms
	EDI Interoceptive awareness means	Target symptoms
	EDI Interpersonal distrust means	Target symptoms
	EDI Maturity fears means	Target symptoms
	EDI Perfectionism means	Target symptoms
	MCMII Borderline subscale	General psychiatric symptoms
	MCMII Dysthymia subscale	General psychiatric symptoms
	Rosenberg Self-esteem means	Psychosocial functioning
SCL-90-R means	General psychiatric symptoms	
Social Adjustment Scale means	Psychosocial functioning	
Poulsen, 2014	BDI means	General psychiatric symptoms
	EDE global means	Target symptoms
	IIP total means	Psychosocial functioning
	No bingeing or purging, last 28 days	Target symptoms
	SCL-90-R means	General psychiatric symptoms
	STAI-S means	General psychiatric symptoms
	STAI-T means	General psychiatric symptoms
Tasca, 2006	BMI means	Target symptoms
	CES-Depression means	General psychiatric symptoms
	Days binged means	Target symptoms
	IIP total means	Psychosocial functioning
	Rosenberg Self-esteem means	Psychosocial functioning
	TFEQ-Hunger means	Target symptoms
Zipfel, 2015	TFEQ-Restraint means	Target symptoms
	BMI means	Target symptoms
	EDI total score means	Target symptoms
	Recovery (PSR & BMI)	Target symptoms
Crits-Christoph, 1999	SIAB-EX means	Target symptoms
	BAI means	General psychiatric symptoms
	BDI means	General psychiatric symptoms
	BSI GSI means	General psychiatric symptoms
	Drug composite means	Target symptoms
	Family composite means	Psychosocial functioning
	HRSD means	General psychiatric symptoms
	IIP means	Psychosocial functioning
	Legal composite means	Psychosocial functioning
	Psychiatric composite means	General psychiatric symptoms

Woody, 1983	Alcohol use factor score means	General psychiatric symptoms
	BDI means	General psychiatric symptoms
	Drug factor means	Target symptoms
	Employment factor means	Psychosocial functioning
	GAS score (SADS-C) means	Psychosocial functioning
	Legal factor means	Psychosocial functioning
	Maudsley N score means	Psychosocial functioning
	Medical factor score means	General psychiatric symptoms
	Psychiatric factor score means	General psychiatric symptoms
	Psychotherapy factor means	General psychiatric symptoms
	SADS anxiety means	General psychiatric symptoms
	SADS depression means	General psychiatric symptoms
	SCL-90 means	General psychiatric symptoms
Clarkin, 2007	Attachment security - classified as secure	Psychosocial functioning
	AIAQ Anger means	Target symptoms
	AIAQ Direct Assault means	Target symptoms
	AIAQ Irritability means	Target symptoms
	AIAQ Verbal assault means	Target symptoms
	BDI means	General psychiatric symptoms
	BSI Anxiety means	General psychiatric symptoms
	Coherence means	Psychosocial functioning
	GAF means	Psychosocial functioning
	Impulsivity Barrett F1 means	Target symptoms
	Impulsivity Barrett F2 means	Target symptoms
	Impulsivity Barrett F3 means	Target symptoms
	OAS Suicidality means	Target symptoms
	Reflective functioning means	Psychosocial functioning
	Resolution of loss means	Psychosocial functioning
Resolution of trauma means	Psychosocial functioning	
Social adjustment scale means	Psychosocial functioning	
Emmelkamp, 2006	Avoidance scale means	Target symptoms
	LWASQ means	General psychiatric symptoms
	PDBQ avoidant means	Target symptoms
	PDBQ dependent means	Psychosocial functioning
	PDBQ obsessive means	Psychosocial functioning
	SPAI social phobia means	Target symptoms
Muran, 2005	IIP means	Psychosocial functioning
	SCL-90 GSI means	General psychiatric symptoms
	Target complaints means	Target symptoms
	WISPI means	Target symptoms
Svartberg, 2004	IIP means	Psychosocial functioning
	MCMII means	Target symptoms
	SCL-90-R GSI means	General psychiatric symptoms

<sup>1</sup>For more details on outcome instruments, readers are referred to the individual studies (eAppendix B) <sup>2</sup>HRSD remission was used at posttreatment, HRSD means was used at follow-up