Pre-treatment patient variables as predictors of drop-out and treatment outcome in cognitive behavioural therapy for social phobia: A systematic review

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Background: Although cognitive behavioural therapy (CBT) has been shown to be an efficacious treatment for social phobia (SP), many patients drop out or achieve little or no benefit from treatment. This fact is generally considered an argument for the importance of studies of predictor variables. Aims: This paper systematically reviews pre-treatment patient variables as predictors of drop-out from and outcome of CBT for SP. Method: A structured literature search was conducted in PsycINFO, Embase and PubMed. Results: 28 published studies with n=60 were located. No pre-treatment patient variables were found to predict drop-out. Consistently across studies, higher levels of pre-treatment symptomatic severity predicted higher levels of end-state symptomatic severity, but not degree of improvement. There was some evidence that comorbid depression and avoidant personality disorder before treatment negatively influenced post-treatment end-state functioning, but not consistently improvement. No other patient variables consistently predicted outcome across studies. Conclusions: Generally, the results are in line with the conclusion that more disturbed patients with SP both begin and end treatment at a higher symptomatic level but with a similar degree of improvement. There is, however, little clinically or theoretically relevant knowledge to be gained from existing studies of pre-treatment patient variables as predictors of drop-out and treatment outcome in CBT for patients with SP. The field is in need of conceptual and methodological improvements if more solid findings should be hoped for.

Cognitive behavioural therapy, Drop-out, Patient variables, Predictive variables, Prognostic variables, Social phobia

Social phobia (SP) or social anxiety disorder is characterized by a marked and persistent fear of social or performance situations in which embarrassment may occur (1). Epidemiological studies suggest lifetime prevalence rates between 7% and 13% in most western countries based on DSM-III-R or DSM-IV (2). However, the figures vary considerably in different studies; probably mainly because of different cut-off lines for clinical cases, since the required degree of distress or functional impairment is not specified in the diagnostic systems. A new, very large epidemiological study in six different European countries found a lifetime prevalence estimate for SP of only 2.4% (3).

If untreated, the disorder tends to run a chronic course and to be associated with lower work productivity, impaired functioning in social and romantic relationships, financial dependency, comorbid psychiatric disorders and poor quality of life (4–6). Mental disorders comorbid with SP especially include major depression, generalized anxiety disorder, personality disorders and alcohol abuse.

Cognitive behavioural therapy (CBT) is the most widely used psychological treatment for SP (7, 8). CBT for SP is often administered in a group format and usually combines exposure exercises with cognitive restructuring, although other methods such as applied relaxation,
rational emotive therapy and social skills training are also included under the CBT heading.

CBT has been shown to be an efficacious treatment for SP. Effect sizes of outcome for CBT derived from meta-analyses are high (9, 10), e.g. Cohen’s (11) $d=1.27$ (pre- to post-treatment) in a meta-analysis of randomized studies (9), although the effect sizes reported in meta-analyses including non-randomized studies comparing with placebo control conditions or using intention-to-treat analyses have been considerably lower (5, 12). The outcome of CBT has been found to be comparable with pharmacological interventions, but with more durable effects of CBT (4, 13). Many patients with SP, however, do not respond to CBT, and the proportion of patients who drop out during treatment is high (10–20%) (9, 10, 14). When drop-out rates are included, clinical trials suggest that 40–50% of patients with SP show little or no improvement after CBT (8, 9, 15). Because of this, there has been an upsurge of interest in prognostic patient variables in CBT for SP. Empirical studies on patient variables relevant for prediction of risk of drop-out or low benefit from treatment seem to be both theoretically and clinically informative. Knowledge about which clients are likely to fail in therapy, and why they would do so, might help in modifying treatment strategies and in delineating critical variables for matching clients to the most suitable treatment programme (16). In their declaration on evidence-based practice in psychology, the American Psychological Association (17) suggests that studies of patient characteristics as moderators of treatment response should be among future research priorities. Predictive patient variables associated with outcome in a specific treatment might imply that the variables are functioning as moderators even though no formal test of patient×treatment interaction (e.g. 18) has been performed.

Zaider & Heimberg (19), Rodebaugh et al. (10) and Lincoln et al. (20) have reviewed the literature on predictors of response to CBT for SP, although neither of these are systematic reviews with comprehensive literature search reported in the articles.

The aim of this study is to conduct a systematic literature review of pre-treatment patient variables associated with the outcome of and drop-out from CBT in the treatment of SP.

**Method**

**Search strategies**

Journal articles were located in PsycINFO, Embase and PubMed from the beginning of the databases to November 2008. Meta-analyses and literature reviews were excluded in the search in PsycINFO. The keywords were (SP or social anxiety disorder) and (cognitive behaviour therapy or patient drop-outs or predictor variables or prognosis or treatment outcomes). The databases descriptors were used when possible. In addition, the articles located were inspected for further relevant references.

**Inclusion criteria**

Studies included in the review examined pre-treatment patient variables as predictors of drop-out rate and/or treatment outcome in CBT. The inclusion criteria were: (a) published studies (b) in English, German or French language (c) that examined pre-treatment patient variables as predictors of outcome and/or drop-out in (d) CBT, e.g. cognitive therapy, social skills training, exposure therapy, or applied relaxation with (e) adult patients (≥18 years) with (f) a formal diagnosis of SP (DSM-III or later version) and (g) a sample size of at least 60. With a sample size of 60 and a moderate effect size ($r=0.30$), the power of a study conducting correlation analysis is 0.65 ($\alpha=0.05$, two-tailed) (11).

Excluded were dissertation abstracts, and studies where different treatment conditions other than CBTs (e.g. medication) were aggregated in the analyses, unless controlling for differential effects of the predictors in the respective conditions.

**Data analysis**

The varied statistical procedures used in the studies do not allow for the calculation of a pooled effect size for the degree of association between variables. Therefore, the box-score method with counts of statistical significant results is used. Most of the studies predicting outcome used several dependent variables and/or performed several statistical analyses on the same variable without statistical correction. In these cases, it was decided to count a result as substantial supportive evidence if at least half of the investigated associations were significant. The results are also expressed as the means of the percentages of the examined associations within each study that were statistical significant. Associations in the opposite direction of the general trend in the studies were subtracted in these calculations. Data are analysed separately for prediction of drop-out and for prediction of treatment outcome. With regard to treatment outcome, a distinction is made between prediction of 1) end-state functioning or responder status on outcome measures after treatment or at follow-up (if the authors only reported a group effect in an ANOVA analysis without a post hoc analysis regarding post-treatment differences, the result was not incorporated in the analysis of end-state functioning), and 2) degree of change or improvement from pre- to post-treatment or from pre-treatment to follow-up. Decline in symptom level measured over the course of treatment by statistical growth trajectories (e.g. hierarchical linear modelling) is categorized as degree of improvement.
Results

The three literature searches in PsycINFO, Embase and PubMed yielded 268, 715 (627 further hits not located in the PsycINFO search) and 580 (355 further hits not located in the PsychINFO or Embase searches) hits, respectively. After inspection of abstracts, 46 articles were retrieved for more detailed evaluation from PsycINFO, 30 additional articles from Embase, 16 additional articles from PubMed and three articles were located from reference lists. Of these 95 references, 67 were excluded and 28 included in the review, with 16 studies examining predictors of drop-out (Table 1) and 25 predictors of treatment outcome (Table 2). Tables 1 and 2 are only published in the online version of the journal at URL: http://www.nordjpsychiatry.com/10.3109/08039480903426929. A list of excluded studies is also available online.

<table>
<thead>
<tr>
<th>Study</th>
<th>n</th>
<th>Predictor variables tested (measures)</th>
<th>Predictors of drop-out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mersch et al. 1989 (44)</td>
<td>74</td>
<td>Severity (PAS, SIB, SCL-90, FQ, Clinician rated avoidance); Rational cognition (RBI and self-statements test); Behavioral test (SSIT)</td>
<td>−RBI; SCL-90; FQ; Clinician rated avoidance</td>
</tr>
<tr>
<td>Brown et al., 1995 (36)</td>
<td>63</td>
<td>APD (PDE); Subtype (GSP vs. NGSP)</td>
<td>NSF</td>
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<tr>
<td>Safen et al., 1997 (35)</td>
<td>113</td>
<td>Treatment expectancy after the first session (RTC)</td>
<td>NSF</td>
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<tr>
<td>van Velzen et al., 1997 (27)</td>
<td>93</td>
<td>APD; Number of PD diagnosis ≥ 2; Severity (social anxiety and depressive symptoms); Additional anxiety or mood disorders; Treatment expectations (the scale is not reported); Demographic variables (Age, Gender, Marital status, Education, Employment Status, Duration of complaints, Previous treatment received); Psychotropic medication use</td>
<td>NSF</td>
</tr>
<tr>
<td>Coles &amp; Heimberg, 2000 (48)</td>
<td>113</td>
<td>Pattern of anxious arousal in anticipation of and during exposure (BAT)</td>
<td>NSF</td>
</tr>
<tr>
<td>Mennin et al., 2000 (41)</td>
<td>75</td>
<td>Comorbid GAD</td>
<td>NSF</td>
</tr>
<tr>
<td>Erwin et al., 2002 (30)</td>
<td>118</td>
<td>Baseline severity (outcome measures); Comorbid mood disorder (DSM-III-R/DSM-IV); Comorbid anxiety disorder (DSM-III-R/DSM-IV)</td>
<td>NSF</td>
</tr>
<tr>
<td>Erwin et al., 2003 (25)</td>
<td>68</td>
<td>Anger experience and expression (STAXI): State anger, Trait anger, Angry temperament, Angry reaction, Anger-In, Anger-Out, Anger control.; Demographic variables (gender, marital status, education, race and age); Baseline severity (SIAS, SPS, BFNE); Trust (RAAS-DEPEND); Quality of life (QOLI); Depressive symp. (BDI)</td>
<td>Trait anger, Anger reaction and Angry temperament</td>
</tr>
<tr>
<td>Rosser et al., 2003 (28)</td>
<td>61</td>
<td>Age; Neuroticism (EPO-N); Depressive symp. (DASS-D); Severity (SPS, SIAS)</td>
<td>−Severity (SPS, SIAS)</td>
</tr>
<tr>
<td>Rosser et al., 2004 (46)</td>
<td>133</td>
<td>Antidepressants medication</td>
<td>NSF</td>
</tr>
<tr>
<td>Herbert et al., 2005 (45)</td>
<td>65</td>
<td>Demographic characteristics (Marital status, Race, Education, Gender, Age)</td>
<td>Gender (female); −Age BDI, HRSD</td>
</tr>
<tr>
<td>Ledley et al., 2005 (22)</td>
<td>279</td>
<td>Depressive symptoms (BDI, HRSB); Severity (BSPS)</td>
<td>MI-A</td>
</tr>
<tr>
<td>Lincoln et al., 2005 (20)*</td>
<td>217</td>
<td>Demographic characteristics (Age; Age of onset, Prior treatment experience, Gender, Marital status, Educational level); Severity (patient rated impairment, CSR, SCL-GSI, SCL-IS, BSQ, BAI, Number of feared situations, Total anxiety on the ADIS-R); Comorbid disorders (ADIS-R, BDI, HZI, ACQ, MI-A, WI); Chronic health problems; Alcohol use (MALTS); Use of benzdiazepines</td>
<td>1 of 3 ratings of attitudes towards treatment</td>
</tr>
<tr>
<td>Hofmann &amp; Suvak, 2006 (26)</td>
<td>133</td>
<td>Demographic characteristics (Age, Sex, Years of education, Family income, Ethnicity and Marital status); Severity (SPAI-SP and CSR); Subtype (GSP vs. NGSP); Depressive symptoms (BDI ); Depression (DSM-IV criteria) Number of additional Axis I diagnoses; Personality disorder traits (PDQ-4); Attitudes towards treatment (three Likert-type ratings)</td>
<td></td>
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<tr>
<td>McEvoy, 2007 (29)</td>
<td>153</td>
<td>Severity (SPS, SIAS), depressive symptoms (BDI), medication use, education, employment status, marital status, age, sex,</td>
<td>Gender (females); −Age</td>
</tr>
<tr>
<td>Huppert et al., 2008 (23)</td>
<td>252</td>
<td>APD (DSM-IV)</td>
<td>NSF</td>
</tr>
</tbody>
</table>

Note. See Appendix for the denotations of the abbreviations of measures. For the denotations of the other abbreviations, see note for Table 2. If treatment duration is not reported, it is estimated on the basis of number of sessions. Drop-outs are associated with a higher score on the predictor variable if the opposite is not indicated by a minus. *Used Bonferroni adjustment (P < 0.002).

Altogether, the studies included 2927 patients. In most of the studies reviewed, at least one of the treatment formats administered was group CBT using the protocol of Heimberg and colleagues (e.g. 21) or a similar protocol (e.g. comprehensive CBT which includes social skills training; 22, 23). Almost half of the studies used more than one treatment condition, e.g. including both individual and group therapy. All studies but one (24) incorporated some form of exposure exercises in the treatment. All studies used DSM-III-R or a later edition of DSM.

Comorbidity

DEPRESSION AND DEPRESSIVE SYMPTOMS

Drop-out. Three studies in Table 1 examined if a diagnosis of major depressive disorder (MDD) predicted drop-out
(25–27) and seven studies (20, 22, 25–29) examined pre-treatment level of depressive symptoms as a predictor of drop-out. Only one of the seven studies (22), a large (n = 279) and well-conducted study, found a significant difference with drop-outs reporting more depressive symptoms.

**Outcome.** Three studies in Table 2 examined MDD as a predictor of outcome (29–31) and nine examined level of depressive symptoms (15, 20, 22, 28, 29, 32–35). Only one (30) of two studies (+31) specifically focusing on MDD found a substantial, negative association with end-state functioning at post-treatment, and no such associations were found at follow-up (45% and 0% significant findings, respectively). No associations were found with regard to improvement at post-treatment or at follow-up in the three studies (12% significant findings for the two data points combined—NB, in the positive direction, i.e. more improvement among patients with MDD).

For degree of depressive symptoms four (15, 22, 33, 35) of six (+28, 32) studies found an association with lower end-state functioning at post-treatment (60% significant findings), and none of two (32, 33) at follow-up (10% significant findings). With regard to degree of improvement, depressive symptomatology predicted less improvement in four (15, 20, 22, 33) of seven studies (+29, 32, 34) at post-treatment, and in two (20, 33) of four (+15, 32) at follow-up (34% and 48% significant findings, respectively). In summary, there is some evidence that an MDD diagnosis or the degree of depressive symptoms is negatively influencing post-treatment end-state functioning after therapy. The association between depression and improvement is less consistent with some studies (29–31) even finding MDD or depressive symptomatology associated with more improvement.

**General Symptomatic Severity**

**Symptomatic severity**

Symptomatic severity covers somewhat different concepts and scales in the different studies, e.g. level of social anxiety and avoidance; clinician rated global severity; or scores on general symptom scales like the General Symptom Index of the SCL-90 (43).

**Drop-out.** Nine studies in Table 1 (20, 22, 25–30, 44) examined if baseline depressive symptoms predicted drop-out. Seven studies did not find a significant difference in severity between drop-outs and completers, and two found opposing results, i.e. in one study (44) drop-outs were more impaired at baseline, while in the other (28) they were less impaired. Thus,
### Table 2. Studies examining pre-treatment patient variables as predictors of treatment outcome.

<table>
<thead>
<tr>
<th>Study</th>
<th>Type of treatment (n, patients)</th>
<th>Duration of trial* (Follow-up)</th>
<th>Predictor variables (Measures)</th>
<th>Criterion variables [Statistical methods]</th>
<th>Results (Quotients of significant associations)/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brown et al., 1995 (36)</strong></td>
<td>CBGT (63, SP)</td>
<td>12 weeks</td>
<td>APD (PDE); Subtype: GSP vs. NGSP (ADIS-R)</td>
<td>3 sets of dependent variables: 1. Questionnaires (SADS; FNE; FO-SP; SIA; D; PS: CS; Q; and BDI); 2. Behavioral test measures (SUDS ratings and STAI); 3. Independent assessor measures (LSAS). Responder status (CGI)</td>
<td>Pre/post: NSF Post: −Subtype (4/4)</td>
</tr>
<tr>
<td><strong>Feske et al., 1996 (33)</strong></td>
<td>BGT (60, GSP)</td>
<td>4 days or 8 weeks (3-months)</td>
<td>APD (SCID-II); Depressive symptoms (BDI)</td>
<td>STAI-T; BD; SAS-SR; GRAI; and PSS SPAI [in a separate analysis] MANOVA; ANOVA; MANCOVA with BDI as the covariate</td>
<td>Pre/post: −APD (1/2); −Depressive symptoms (1/2). Follow-up: −Depressive symptoms (2/2) Post: −APD (2/2). Follow-up: −APD 2/2</td>
</tr>
<tr>
<td><strong>Leung &amp; Heimberg, 1996 (49)</strong></td>
<td>CBGT (91, SP)</td>
<td>12 weeks</td>
<td>Locus of control (LOCs)</td>
<td>SIAS [Mregress: 1. Prior SIAS; 2. LOCs]</td>
<td>Pre/post: NR Post NSF</td>
</tr>
<tr>
<td><strong>Chambless et al., 1997 (32)</strong></td>
<td>CBGT (62, SP)</td>
<td>12 weeks (6 months)</td>
<td>Depressive symptoms (BDI); Expectancy (TES); Personality disorder traits (MCMII); Social impairment (GISDS); Medication use</td>
<td>Factor-analytical derived variables: 1. Anxious apprehension; 2. Dyad anxiety and skill; 3. Speech anxiety; 4. Speech skill; 5. Observed rated anxiety and skill [CorRes; Mregress: Expectancy, Medication, APD traits OR Depressive symptoms]</td>
<td>Pre/post: −Depressive symptoms (1/5); +Expectancy (1/5); −APD-trait (1/5); −OCD-trait (1/5); −Medication use (1/5). Pre/follow-up: −Depressive symptoms (2/5); +Expectancy (1/5); −Histrionic PD traits (1/5) Post: −APD traits (1/5). Follow-up: −Medication use (1/5); +Expectancy (1/5); −Histrionic symptoms (1/5)</td>
</tr>
<tr>
<td><strong>Safren et al., 1997 (35)</strong></td>
<td>CBGT (113, SP)</td>
<td>12 weeks</td>
<td>Treatment expectancy after the first session (RTQ); Severity (outcome measures): Depressive symptoms (BDI, HRSD)</td>
<td>CSR; SIA; SPS; LSAS-P; LSAS-P; FQ-SP; BDI; HRSD [8 Mregress: 1. Pre-treatment severity; 2. RTQ]</td>
<td>Pre/post: NR Post: +Expectancy (6/8); −Severity (6/6); −Depressive symp (2/2) / pre-treatment level of depressive symptoms predicted post-treatment level of depressive symptoms Post: −PDE2 (1/4; BDI). Follow-up: −APD (1/4)</td>
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<tr>
<td><strong>Van Velzen et al., 1997 (27)</strong></td>
<td>EXP (93, SP)</td>
<td>10 weeks (3 months)</td>
<td>Number of PD diagnoses (SCID-II); APD; Additional anxiety or mood disorders (ADIS-R)</td>
<td>Three composite variables (1. Avoidance; 2. Cognition; 3. Target situations). BDI [MANOVA; χ²]</td>
<td>Pre/post: NSF Pre/follow-up: NSF</td>
</tr>
<tr>
<td>Study</td>
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<td>Coles &amp; Heimberg, 2000 (48)</td>
<td>CBGT (90, SP)</td>
<td>12 weeks</td>
<td>Patterns of anxious arousal in anticipation of and during exposure in a BAT (4 groups based on hierarchical cluster analysis)</td>
<td>SIAS; SPS; LSAS-Fe; LSAS-FP; LSAS-A; LSAS-AP; CRC; Thought Listing (pos. and neg.); BDI; Responder status; Proportion of patients no longer meeting diagnostic criteria. [ANOVA; χ²]</td>
<td>Pre/post: +Patterns of anxious arousal (2/9)/Higher degree of change in the high anxiety groups Post: −Patterns of anxious arousal (2/4)/lower end-state functioning in the high anxiety groups</td>
</tr>
<tr>
<td>Mennin et al., 2000 (41)</td>
<td>CBGT (75, SP)</td>
<td>12 weeks</td>
<td>Comorbid GAD (ADIS-R)</td>
<td>CSR; SPS; SIAS; LSAS-F; LSAS-A; Responder status (CGI) [ANOVA; χ²]</td>
<td>Pre/post: +GAD (1.5) Post: NSF</td>
</tr>
<tr>
<td>Stangier et al., 2001 (38)</td>
<td>CBT/CBGT (71, SP)</td>
<td>15 weeks (6 months)</td>
<td>APD (SCID-II)</td>
<td>SPAI; SCL-GSI [ANOVA]</td>
<td>Pre/post: NSF Post NSF</td>
</tr>
<tr>
<td>Cox et al., 2002 (34)</td>
<td>CBGT (84, GSP)</td>
<td>NR</td>
<td>Baseline severity (a composite of FNE, SADS, SPS, SIAS, SPAI); Interpersonal dependency (DEQ); Perfectionism/self-criticism (DEQ); Depressive symptoms (BDI)</td>
<td>A composite of FNE; SADS; SPS; SIAS; SPAI; FQ-SP; BDI [Mregress: BDI; DEQ; Social phobia composite]</td>
<td>Pre/post: +Baseline severity/social phobia composite (1/1) Post: NR</td>
</tr>
<tr>
<td>Erwin et al., 2002 (30)</td>
<td>CBGT (118, SP)</td>
<td>12 weeks (6 and 12 months)</td>
<td>Comorbid mood disorder (ADIS-III-R/-IV); Comorbid anxiety disorder (ADIS-III-R/-IV)</td>
<td></td>
<td>Pre/post: +Comorbid mood disorders (1/4)/Larger change on BDI Pre/follow-up: +Comorbid mood disorders (1/4)/Larger change on BDI Post: −Comorbid mood disorders (1/4)</td>
</tr>
<tr>
<td>Oosterbaan et al., 2002 (24)</td>
<td>CT, moelobe-mide or placebo (82, SP)</td>
<td>15 weeks (2 and 15 months)</td>
<td>APD (SCID-II)</td>
<td>LSAS-AX; LSAS-AV [Residualized] [2 Mregress 1. treatment condition; 2. APD]</td>
<td>Pre/post: −APD (1/2). Pre/post follow-up: NSF Post: −APD (2/2) Follow-up: −APD (4/4)</td>
</tr>
<tr>
<td>Erwin et al., 2003 (25)</td>
<td>CBGT (68, SP)</td>
<td>12 weeks</td>
<td>Anger experience and expression (STAXI): State anger; Trait anger; Angry temperament; Angry reaction; Angry-In; Angry-Out; Anger control</td>
<td>BFE; SPS; SPS; BDI [4 Mregress: 1. pre-score on outcome measure; 2. STAXI-subscales]</td>
<td>Pre/post: NR Post: −State anger (3/4); −Anger-in (3/4); −Angry reaction (3/4); −Trait anger (1/4)</td>
</tr>
<tr>
<td>Rosser et al., 2003 (28)</td>
<td>CBGT (61, SP)</td>
<td>7 weeks</td>
<td>Neuroticism (EPQ-N); Depressive symptoms (DASS-D); Severity (SPS, SIAS); Perfectionism: Concern over mistakes (MPS-F-C)</td>
<td>The mean standardized score on the SPS and SIAS [Mregress: 1. severity; 2. DASS_D; EPQ-N; 3. MPS-F-C]</td>
<td>Pre/post: NR Post: −Severity (1/1)</td>
</tr>
<tr>
<td>Rosser et al., 2004 (46)</td>
<td>CBGT (133, SP)</td>
<td></td>
<td>Antidepressant medication</td>
<td>DASS-depression; SPS; SIAS; FNE; SF-12 [ANOVA]</td>
<td>Pre/post: NSF</td>
</tr>
<tr>
<td>Hofmann, 2004 (61)</td>
<td>CBGT/EXPG/ Waiting list (90, SP)</td>
<td>12 weeks (6 months)</td>
<td>Age</td>
<td>SPAI, SCQ, speech length on a BAT [MANOVA]</td>
<td>Post: NR. Follow-up: NR</td>
</tr>
<tr>
<td>Joornan et al., 2005 (31)</td>
<td>CBT (70, SP)</td>
<td>24 weeks</td>
<td>MDD</td>
<td>Mi-Alone; Mi-Acc.; FNE; PERI-D; BDI [ANOVA; HLM]</td>
<td>Pre/post: +MDD (1/10) Post: −MDD (4/10)</td>
</tr>
<tr>
<td>Study</td>
<td>Type of treatment (n, patients)</td>
<td>Duration of trial* (Follow-up)</td>
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<tr>
<td>Ledley et al., 2005 (22)</td>
<td>CCBT and/or fluoxetine/placebo (279, GSP)</td>
<td>14 weeks</td>
<td>Depressive symptoms (HRSD, BDI); Severity (BSPS)</td>
<td>BSPS; CGI (ITT and completer analyses) [ANOVA; t-test]</td>
<td>Pre/post: −Depressive symptoms (1/2)/BDI but not HRSD</td>
</tr>
<tr>
<td>Lincoln et al., 2005 (20)</td>
<td>Intensive CBT (217, SP)</td>
<td>7 days; post-assessment conducted 6 weeks after treatment began (1 year)</td>
<td>Demographic data (Age; Age of onset; Prior treatment experience; Gender; Marital status; Educational level); Severity (degree of impairment [patient rated and clinician rated]; SCL-GSI, BSQ, BAI); Number of feared situations; Total anxiety (ADIS); Comorbid disorders (ADIS-R, BDI, HZI, ACQ, MI-A, WI); Chronic health problems; Alcohol use (MALT-S); Use of benzodiazepines</td>
<td>SCL-LS [Residualized]; RGI [Cor]</td>
<td>Pre/post: −Severity (2/10); −Number of feared situations (1/2); −Total anxiety (2/2); −Comorbidity (2/14; BDI: 1/2); Pre/follow-up: +Demographic variables (3/14) Female, marriage, education; −Severity (2/10); −Number of feared situations (2/2); −Total anxiety (2/2); −Comorbidity (2/14; BDI: 1/2)</td>
</tr>
<tr>
<td>Bögels, 2006 (39)</td>
<td>TCT+CBT or AR+CBT (65, SP with fear of bodily symptoms)</td>
<td>16 weeks</td>
<td>Erythrophobia vs. tremophobia; PD (SCID-II); Prior treatment</td>
<td>BTSQ; SPAI, FQ; SCL-90-IS; FNE-short version; SFA; CCM [MANOVA]</td>
<td>Pre/post: NSF Follow-up: NR</td>
</tr>
<tr>
<td>Ashbaugh et al., 2007 (40)</td>
<td>CBGT (107, SP)</td>
<td>12 weeks</td>
<td>Perfectionism (FMPS); Negative affect (DASS-21); Severity (SP; SIAS)</td>
<td>SPS; SIAS [Mregress: 1. Prescores on outcome measures; 2. DASS-21; 3. FMPS subscales]</td>
<td>Pre/post: NR Post: −Severity (2/2); −Negative affect (2/2)</td>
</tr>
<tr>
<td>McEvoy, 2007 (29)</td>
<td>CBGT (153, SP)</td>
<td>7 weeks</td>
<td>Depression (BDI &gt; 17); Age (&gt; 49 years); Comorbid anxiety; Comorbid depression; Alcohol problems; Being a student</td>
<td>SPS; SIAS; BDI [t-test]</td>
<td>Pre/post: +BDI&gt;17 (1/3)/Larger change on BDI Post: NR</td>
</tr>
<tr>
<td>Huppert et al., 2008 (37)</td>
<td>CCBT and/or fluoxetine/placebo. (252, GSP)</td>
<td>14 weeks</td>
<td>APD (SCID-II)</td>
<td>BSPS; CGI [ANOVA; ITT and completer analyses]</td>
<td>Pre/post: NSF/Patients with APD improved more from weeks 0–4 Post: NR</td>
</tr>
<tr>
<td>McEvoy &amp; Shand, 2008 (42)</td>
<td>CBT/CBGT (200, anxiety disorders; 82, SP)</td>
<td>NR</td>
<td>Substance abuse</td>
<td>DASS [MANOVA]</td>
<td>Pre/post: NSF Post: NR</td>
</tr>
</tbody>
</table>

**Notes.** General: A "−" denotes that a higher score on the predictor variable is associated with less improvement or lower end-state functioning, and a "+" denotes an association in the opposite direction; NR denotes that no data are reported; BAT, Behavioral Activation Test; CRC, Clinician rated change; NSF, No significant findings. **Diagnoses:** APD, avoidant personality disorder; PD, personality disorders; GAD, generalized anxiety disorder; MDD, major depressive disorder; OCD, obsessive–compulsive disorder; SP, social phobia. **Treatments:** AR, applied relaxation; BT, behaviour therapy; BGT, behaviour group therapy; CBT, cognitive behavioural therapy; CBGT, cognitive behavioural group therapy; CCBT, comprehensive cognitive–behavioural therapy; CT, cognitive therapy (without behavioural methods); EXP, exposure; EXPG, exposure treatment in groups; TCT, task concentrations training. **Measures:** Abbreviations of measures are explained in Appendix A.
the existing studies seem to imply that baseline symptomatic severity does not influence drop-out rate.

**Outcome.** Seven studies in Table 2 examined the role of symptomatic severity in predicting treatment outcome (15, 20, 22, 28, 34, 35, 40). All four studies (15, 28, 35, 40) examining severity’s role in predicting end-state functioning after treatment found that higher severity before treatment predicted higher severity after treatment on all outcome measures; and the same result was found for one study (15) with regard to follow-up (only one study (15) controlled for baseline scores on the dependent variables). Four studies (15, 20, 22, 34) investigated severity’s role in predicting less improvement with two studies finding significant associations in opposite directions, one positive (34) and one negative (15), at post-treatment, and no association in two studies (15, 20) at follow-up (7% and 21% significant findings, respectively). In summary, there is consistent evidence that pre-treatment symptomatic severity predicts symptomatic severity after therapy, but no evidence that it predicts degree of improvement.

**SP SUBTYPES**

**Drop-out.** Only one study in Table 1 (36) compared generalized SP with non-generalized SP and found no significant differences in drop-out rate between the groups. One study (20) categorized clinician rated degree of anxiety and number of feared situations under the heading of “Subtypes”, but in this review, the two variables are considered measures of symptomatic severity.

**Outcome.** The same study was also the only one to examine SP subtypes as predictors of treatment outcome. Patients with generalized SP were more severely disturbed on all outcome measures before and after therapy and more patients with non-generalized SP were classified as treatment responders (clinician rated) compared with the group of generalized SP. No differences were found with regard to improvement on outcome measures, however.

**Demographic variables**

**Drop-out.** Six studies in Table 1 (20, 26, 27, 29, 30, 45) examined the role of demographic variables (age, age of onset, prior treatment experience, gender, marital status, educational level, family income, ethnicity, and employment status) in the prediction of drop-out. Two studies (29, 45) found significant associations in that younger and female patients were more likely to drop out.

**Outcome.** The one study in Table 2 (20) examining demographic variables as predictors of outcome found no significant associations between such variables and improvement from pre- to post-treatment. At 1-year follow-up, females, married patients and patients with higher education were more improved on one of two outcome measures.

**Expectancy**

**Drop-out.** Three studies in Table 1 (26, 27, 35) examined treatment expectancy or patients’ attitudes toward treatment as predictors of drop-out, but only one (26) found statistical significant results for one of three variables.

**Outcome.** Two studies in Table 2 (32, 35) investigated the role of expectancy. One study (32) found that expectancy positively predicted improvement (pre/post-treatment and pre-treatment/follow-up) in one of five outcome measures, and the other (35) found that it positively predicted end-state functioning in six of eight outcome measures (altogether, i.e. covering end-state and improvement, at post-treatment and follow-up, 38% significant findings).

**Medication use before and during therapy**

**Drop-out.** Three studies in Table 1 (20, 27, 46) examined if medication use before and during therapy predicted drop-out with no significant findings.

**Outcome.** Three studies in Table 2 (20, 32, 46) examined the impact of medication use on treatment outcome with no substantial associations.

**Social anxiety-related cognition**

**Drop-out.** One study in Table 1 (44) found that social anxiety-related cognition in relation to a behavioural activation test (BAT) predicted drop-out on one of two measures.

**Outcome.** One study in Table 2 (15) found no associations between the frequency of positive and negative cognition in social situations at pre-treatment and end-state functioning or improvement from pre- to post-treatment or from pre-treatment to follow-up.

**Anger**

**Drop-out.** One study in Table 1 (25) found that drop-outs endorsed a greater disposition to experience and express anger on three of seven scales of the State–Trait Anger Expression Inventory (47).

**Outcome.** The same study found that three of seven measures of anger predicted three of four measures of end-state functioning, while one additional measure of anger predicted one measure at post-treatment.

**Patterns of anxious arousal**

**Drop-out.** One study in Table 1 (48) examined patterns of anxious arousal during a BAT and classified patients into four groups: “high anxiety”, “increasing/high anxiety”, “moderate anxiety” and “mild anxiety”, according to their responses to eight SUDS probes during the BAT. No association was found between patterns of anxious arousal and drop-out during treatment.
Outcome. The same study also examined the predictive value of patterns of anxious arousal on treatment outcome. A significant association was found between lower anxious arousal before treatment and higher responder rate after treatment on two of four measures and between higher anxious arousal before treatment and more improvement during therapy on two of nine measures.

Miscellaneous variables
Studies have examined several other pre-treatment patient variables as predictors of drop-out or treatment outcome, but failed to find significant results: Social impairment (Table 2; 32); trust and quality of life (Table 1; 25); chronic health problems (Tables 1 and 2; 20); negative affect (Table 2; 40) and locus of control (Table 2; 49) (see Tables for information on the studies).

Discussion
More than 15 years after Steketee & Chambliss (16, p. 390) declared prediction research “a stepchild to behavioural outcome research”, the field has witnessed an increased attention with more than 60% of the studies in this sample being from 2000 or later. There are, however, still rather few studies, and their divergent variables and methods limit any conclusions to be drawn from them.

Almost no pre-treatment patient variables predicted drop-out from CBT for SP in the reviewed studies. This result is in line with conclusions from other reviews that the psychotherapy termination literature in general is considered inconclusive (50).

Only a few variables predicted outcome. MDD or depressive symptoms prior to therapy were associated with lower end-state functioning after therapy, but only inconsistently with less improvement during therapy. Correspondingly, APD or APD symptomatology was in some studies associated with lower end-state functioning, but not with less improvement. Comorbidity with other disorders, e.g. other anxiety disorders, substance abuse, PD or PD traits was not found to be associated with outcome in the studies. Treatment expectancy and anger expression showed promising results in a few studies.

The only consistent finding in this review was that prior symptomatic severity predicted lower end-state functioning after therapy and at follow-up, although it was not associated with degree of improvement. This finding is in line with Rodebaugh et al.’s (10) conclusion, that more disturbed patients with SP (including patients with generalized SP and APD) both begin and end treatment at a higher symptomatic level, but with a similar degree of improvement as less disturbed patients; as well as with conclusions on predictor variables in CBT for other anxiety disorders (e.g. 51, 52). This conclusion might also cover the findings regarding depression and APD in this review.

From a positive point of view, the few prognostic factors in CBT for SP might be interpreted as indicating that even severely disturbed SP patients could profit from short time CBT, although severely disturbed patients might not achieve end-state functioning close to normality. The finding of few prognostic factors should, however, be interpreted on the background of the restricted range of severity/comorbidity in most studies. Few clinicians doubt that e.g. severe depression, severe substance abuse or severe personality disorders, would highly impede treatment for patients with SP.

Research on predictor variables in psychotherapy is a challenging field, conceptually and methodological. Conceptually, many of the relevant variables of predictors, as well as of outcome, could be supposed to load highly on negative affectivity. Thus, the dependent variables might be contaminated by the independent. It should come as little surprise that symptomatic severity before treatment is associated with severity after treatment. The association between pre-treatment severity and improvement or degree of change might be influenced by regression towards the mean. This is taken into account in most studies by using residual change scores or firstly entering pre-treatment scores in the regression analysis but in case of predictor variables loading on negative affect, residual change scores partly correct for the predictors of interest. Besides, if there is no association between pre-treatment variables loading on negative affect and improvement, this might be related to a combination of two forces drawing in different directions, namely regression towards the mean and less responsiveness among severely disturbed patients. The problem is a common one in psychological research with variables characterized by loose boundaries and conceptual and/or measurement overlap (cf. 53).

Optimally, the study should try to disentangle the specific contribution of the predictor variable after taking negative affect into account, which was only attempted in a few of the studies. Thus, in two studies on perfectionism with a similar design (28, 40), pre-treatment scores on the outcome variable was firstly entered in the regression analysis, secondly measures of negative affect, and then, thirdly, the perfectionism dimensions of interest. Perfectionism was not found to be a specific predictor in these studies.

As in all psychotherapy research, the power problem is a serious one. The correlations between predictors and outcome are mostly small to moderate demanding large samples to achieve acceptable power (n≥200 if r=0.2, and power=0.8 in a correlation analysis). Only three studies in the sample had n>200. Exclusion of severe cases in controlled studies will narrow the range in many relevant predictor variables (e.g. severity and comorbidity) thus lowering the chance of significant findings. Comparing groups of unequal size further reduces power, which is a highly relevant concern with studies of drop-outs, and with dichotomous predictors, e.g. comorbid diagnoses. If e.g. the expected drop-out rate is 20% (a high percentage according to prior studies), a sample of at least 200 is
needed for an 80% chance of finding a difference between drop-outs and completers if the population difference is moderate ($d=0.50$; $a=0.05$, two-tailed) (11). Consequently, it is not surprising that a high proportion of the studies had statistically insignificant findings.

Further research would profit from large, naturalistic studies with a high degree of variability in the relevant predictor variables. Study samples could be enlarged by cooperation between research centres. Some strategies, now widely recommended for outcome research (54, 55), might also help to promote the field, namely to use one primary measure of outcome, and always report effect sizes for an association (e.g. correlations with end-state and residual gain score, or $d$-values). Reporting effect sizes (or relevant variables for calculating them) would highly facilitate research syntheses.

Preferably, future studies should include more theoretically derived variables, e.g. related to the proposed subtypes of SP by Hofmann et al. (56). Ultimately, the most interesting question is, of course, about the relationship between differentially moderating variables in different forms of treatments, so-called aptitude–treatment interactions (57). The problems inherent in the much less complex study of predictive variables within one form of treatment, as exemplified in the present review, might help in understanding why little progress has been made in answering this question.

Most probably, prognostic patient variables interact in complex patterns of causal relationships. With large samples ($n>c.300$) structural equation modelling (58) could be used to test specific models of the associations between different pre-treatment variables and outcome. From quite another corner of the research landscape, multiple intensive case studies have been suggested as a method suited for investigation of the complex, idiographic patterns of patient prognostic variables (59, 60). At present there are, however, no studies in the field using structural equation modelling, and few systematic case studies.

The review has some limitations. Thus, only published studies were included, but most well performed large studies will be published. Because of characteristics of the studies, it was not possible to use meta-analytic data-synthesis, which is better suited than the box-score method to take small associations in underpowered studies into account. By excluding studies with $n<60$, and by using the criteria for counting results mentioned in the section on data analysis the review might compensate for one of the main problems of box score reviews, namely to give undue weight to findings from small studies. The nature of the results with very few significant findings, furthermore, makes it implausible, that more sophisticated data synthesis methods (if they had been possible) would have resulted in substantially different conclusions. Anyhow, the review should be considered an improvement over former, more impressionistic box score or narrative reviews (10, 20).

The most important conclusion from the review is that there is little clinically or theoretically relevant knowledge to be gained from existing studies of pre-treatment patient variables as predictors of drop-out and treatment outcome in CBT for patients with SP. It seems unlikely that more studies of the same kind would result in a markedly different conclusion. The field is in need of conceptual and methodological improvements if more solid findings should be hoped for.

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References


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Appendix

Abbreviations of scales

ACQ, the Agoraphobia Cognition Questionnaire; ADIS-R, Anxiety Disorders Interview Schedule-Revised; BAI, Beck Anxiety Inventory; BAT, Behavioral Assessment Test; BDI, Beck Depression Inventory; BFNE, Brief Fear of Negative Evaluation; BSPS, the Brief Social Phobia Scale; BSQ, Body Sensation Questionnaire; CGI, the Clinical Global Impression Scale; CSR, Clinician Severity Rating (ADIS-R or ADIS-IV); CSAQ, the Cognitive–Somatic Anxiety Questionnaire; DASS-D, the Depression subscale of the Depression Anxiety and Stress Scale; DEQ, the Depressive Experiences Questionnaire; EPQ-N, Eysenck Personality Questionnaire—Neuroticism Scale; FNE, the Fear of Negative Evaluation Scale; FQ-SP, the Social Phobia subscale of the Fear Questionnaire; GISDS, the Global Impairment of Social Domains; GRAI, the Gambrill and Richey Assertion Inventory; HRSD, Hamilton Rating Scale for Depression; HZI, the Hamburg Obsessive-Compulsive Inventory; LOCS, The Levenson Locus of Control Scale; LSAS, the Liebowitz Social Anxiety Scale; LSAS-AX, Anxiety subscale of the LSAS; LSAS-AV, Avoidance subscale of the LSAS; LSAS-I, LSAS social interaction subscale; LSAS-P, LSAS performance subscale; LWASQ-B, the Behavior subscale of the Lehrer-Woolfolk Anxiety Symptom Questionnaire; MALT-S, the Self-evaluation scale of the Munich Alcoholism Test; MCMI, the Millon Clinical Multiaxial Inventory; MI, the Mobility Inventory; MI-A, the Alone subscale of the MI; MPS-F, the Multidimensional Perfectionism Scale; PAS, The phobic anxiety scale; PDE, The Personality Disorders Examination; PDQ-4, the Personality Diagnostic Questionnaire for DSM-IV; PERI-D, the Demoralization scale of the Psychiatric Epidemiology Research Interview; PSS, the Personal Self Scale of the Tennessee Self-Concept Scale; QOLI, the Quality of Life Inventory; RAAS-DEPEND, The DEPEND subscale of the Revised Adult Attachment Scale; RBI, the Rational Behavior Inventory; RGI, The rating of global improvement; RTQ, Reaction to Treatment Questionnaire; SADS, the Social Avoidance and Distress Scale; SAS-SR, the Social Adjustment Scale, Self-Report version; SASSI, the Social Anxiety Self-Statements Inventory; SCL-90, The Symptom Checklist; SCL-D, the Depression subscale of the SCL-90; SCL-GSI, The global severity index of the SCL-90; SCL-IS, the Interpersonal sensitivity subscale of the SCL-90; SIAS, the Social Interaction Anxiety Scale; SIB, Scale for Interpersonal Behavior; SPAI-SP, the Social Phobia scale of the Social Phobia and Anxiety Inventory; SPS, the Social Phobia Scale; SSIT, This test consists of 8 brief social interactions and was used to assess behavioral skills; STAI-S, the State section of the State–Trait Anxiety Inventory; STAI-T, the Trait section of the State–Trait Anxiety Inventory; STAXI, the State–Trait Anger Expression Inventory; SUDS, patients provided 0 to 100 anxiety ratings during a BAT; TES, the 4-item Treatment Expectancy Scale; WI, The Whiteley Index (Hypochondriasis).