Meta-Analysis of Dropout From Cognitive Behavioral Therapy: Magnitude, Timing, and Moderators

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In this era of insistence on evidence-based treatments, cognitive behavioral therapy (CBT) has emerged as a highly preferred choice for a spectrum of psychological disorders. Yet, it is by no means immune to some of the vagaries of client participation. Special concerns arise when clients drop out from treatment. *Objective:* The aim of this study was to answer questions about the rate and timing of dropout from CBT, with specific reference to pretreatment versus during treatment phases. Also explored were several moderators of dropout. *Method:* A meta-analysis was performed on dropout data from 115 primary empirical studies involving 20,995 participants receiving CBT for a range of mental health disorders. *Results:* Average weighted dropout rate was 15.9% at pretreatment, and 26.2% during treatment. Dropout was significantly associated with (a) diagnosis, with depression having the highest attrition rate; (b) format of treatment delivery, with e-therapy having the highest rates; (c) treatment setting, with fewer inpatient than outpatient dropouts; and (d) number of sessions, with treatment starters showing significantly reduced dropout as number of sessions increased. Dropout was not significantly associated with client type (adults or adolescents), therapist licensure status, study design (randomized control trial [RCT] vs. non-RCT), or publication recency. *Conclusions:* Findings are interpreted with reference to other reviews. Possible clinical applications include careful choice and supplementing of treatment setting/delivery according to the diagnosis, and use of preparatory strategies. Suggestions for future research include standardization of operational definitions of dropout, specification of timing of dropout, and exploration of additional moderator variables.

What is the public health significance of this article?
This meta-analysis discovered that dropout from cognitive behavioral therapy (CBT) occurs even before treatment starts, rising to an even higher level during treatment, total attrition rate across both phases reaching about 35%. Ironically, other factors being constant, the longer the planned course of CBT, the less likely a treatment starter will drop out. Dropout risk is significantly higher in depressed clients, outpatient settings, and e-therapy. Findings suggest a need for preparatory strategies and careful selection and supplementation of treatment setting/delivery according to the diagnosis in question.

Keywords: meta-analysis, cognitive behavioral therapy, CBT, dropout, attrition

Dropout From Psychotherapy

In psychotherapy, the word *dropout* refers to a client who discontinues therapy prematurely, in contrast with the *continuer* or *completer* of therapy. The concept is often expanded to encompass those clients who do not commence therapy made available to them, also called *refusers*. In the case of both the discontinuer and refuser, the client's decision is made against professional advice. Cumulative loss of clients over the course of therapy is termed *attrition*, the inverse of which is *retention*.

Attrition is often viewed as problematic not merely because it means missing data and reduced statistical power for researchers and loss of revenue to clinicians, but also because the client's mental health needs are not being served. In group therapy, there is the further complication of disruption to the group process due to membership changes when some drop out and others continue. The central question that has occupied most of the research in this field is how much attrition actually occurs in psychotherapy, or the *magnitude* of attrition. Equally important is the question about the *timing* of attrition, as stated by Self, Oates, Pinnock-Hamilton, and Leach (2005). A third question is whether attrition varies as a function of certain moderator variables. The answers to these

questions may hold clues as to *why* clients drop out and direct special efforts to help retain them.

Although studies of psychotherapy do not routinely report attrition data, some do provide at least a percentage or ratio of the dropouts relative to the sample. Notable are several reviews that have attempted to synthesize these data into some kind of average dropout rate. In their review, Dubrin and Zastowny (1988) found elevated levels of attrition between the fifth and eighth sessions, or else between the third and tenth sessions, or even between the sixth and nineteenth sessions, and in some cases, five months into therapy. Basically, as Reis and Brown (1999) remarked, "This literature is highly contradictory, and results are difficult to reconcile" (p. 123).

An early attempt to aggregate dropout frequency across 125 psychotherapy outcome studies led to a mean dropout rate of 46.86% (Wierzbicki & Pekarik, 1993). More recently, Swift and Greenberg (2012) extracted dropout data covering an extensive body of psychotherapy literature published between 1990 and 2010 (excluding studies of psychosocial intervention on substance dependence, or medical problems such as those involving body weight). Their meta-analysis of 669 studies showed that the during treatment dropout rate averaged 19.7%, with a range of 0%–74%.

Dropouts From Cognitive Behavioral Therapy

Branching off from the above research on attrition in psychotherapy has been a new line of reviews of attrition in cognitive behavioral therapy (CBT), the present study following in those footsteps. This focus is in part an attempt to reduce the heterogeneity of variance in data associated with different schools of therapy. Moreover, CBT has become a dominant therapeutic paradigm that has attracted a critical mass of published studies (Epp & Dobson, 2010). Although applied to a variety of disorders, these applications of CBT share much in common—the modification of appraisals, belief systems, and instrumental behaviors mainly through techniques derived from theories of operant and insight learning. This unity allows meaningful aggregation and interpretation of findings regarding the magnitude and timing of attrition in CBT.

An important precedent in this field of enquiry is the narrative review by Salmoiraghi and Sambhi (2010). They identified 14 studies pertaining to early termination in CBT. Most of these were cohort studies. Their conclusion was that there was an attrition rate of 19%–50%, with "no single strong predictor" (p. 529).

A quantitative review was undertaken by van Ingen, Freiheit, and Vye (2009) in which 11 studies of CBT for anxiety disorders were deemed worthy of inclusion because of their relevance to "real world practice" (p. 69). Clients who commenced treatment but did not complete posttreatment assessment were found to make up an average of 26% of the samples, with a range of 9%–36%.

In their recent meta-analysis of CBT dropout rates, Hans and Hiller (2013a) explored attrition in studies of depression, both from research and clinical settings. Dropout was operationally defined as attendance of more than one session but failure to complete all sessions. A total of 23 studies contained posttreatment dropout data. The overall findings were that "Despite favorable treatment effects for those completing treatment, dropout from treatment was considerable., . . . On average, every fourth person failed to complete therapy" (p. 82), with dropout ranging widely from 0%-68%. The duration of therapy ranged anywhere from 10–40 sessions of individual therapy or six to 24 sessions of group therapy, leaving it unclear as to what point or stage of therapy most of the attrition occurred. Further examining a group of "benchmark studies" involving randomized control trials (RCTs) of CBT for depression, the authors found a large variation in dropout rate ranging from 8.05% to 32.20% for CBT in individual format, and 3.13% to 40% for group CBT. In a separately published meta-analysis of CBT outcome for anxiety disorders, Hans and Hiller (2013b) reported a narrower range of dropout rate (11.73% for obsessive–compulsive disorder, 15.31% for social phobia, 17.52% for panic disorder, and 27.68% for posttraumatic stress disorder [PTSD]).

In the present study, CBT attrition is examined without a restricted focus on any particular disorder. Within the scope of this review are any publications of CBT involving some attention to attrition. At a basic level, the magnitude of attrition is represented with statistics of central tendency and dispersion. Wherever possible, the attrition data are presented as a function of treatment phase, with consideration to the pretreatment and the during treatment stages. In this way, what might be gleaned from the data is a broader picture of the magnitude (including average and variance), and timing of attrition over the course of CBT. Finally, a search for moderator variables, including, but not limited to, diagnostic, treatment, therapist, and client variables, is undertaken in an effort to qualify or explain the magnitude and timing of dropout.

Method

Literature Search Procedures

As outlined in Figure 1, the PsycINFO electronic database was searched for all publications having a combination of keywords appearing anywhere in the title, abstract, or body of text. In this combination, one of the keywords had to be *cognitive behavioral therapy*, or its lexical variations such as *cognitive behavior therapy*, the British-spelled *cognitive behavioural therapy*, or the acronym *CBT*. The other keyword had to be *dropout* as one word or as two words (*drop out*) or else hyphenated (*drop-out*). Also checked were dropout synonyms (e.g., *attrition*, *premature termination*) and antonyms (e.g., *retention*, *completer*). The literature search was expanded by browsing relevant articles and additional databases, Medline in particular. This produced a huge number of duplicate entries from which a set of 380 unique articles was obtained.

No restrictions were placed on the publication date of studies, the majority of which appeared after the 1980s, the most recent being in December 2014. However, restriction was placed on language, so that only those published in English were included. In terms of publication outlet, journal articles as well as book chapters were included but unpublished dissertations and theses were excluded. In all cases, data were extracted only from original reports of research rather than from review articles synthesizing research from other sources. This led to a set of 231 articles. From this set was culled a final set of 115 articles in which (a) the treatment actually conformed to CBT and (b) unambiguous data were available on the magnitude and timing of dropout (pre- vs. during treatment). These 115 articles are included in a separate reference list for "Online Supplemental Archive."

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┌─────────────────────────────────────┐
│ Pool of studies combining relevant  │
│ keywords anywhere in document       │
│                                     │
│            (k =1990)                │
└─────────────────────────────────────┘

┌─────────────────────────────────────┐
│ Listing of unique studies with      │
│ relevant keyword combination        │
│ anywhere in the document            │
│                                     │
│            (k =380)                 │
└─────────────────────────────────────┘

┌─────────────────────────────────────┐
│ Selection of studies meeting        │
│ criteria based on publication       │
│ outlet, original research, and      │
│ language                            │
│                                     │
│            (k = 231)                │
└─────────────────────────────────────┘

┌─────────────────────────────────────┐
│ Full-text review to identify        │
│ studies conforming to CBT and       │
│ providing usable data on attrition  │
│                                     │
│            (k = 115)                │
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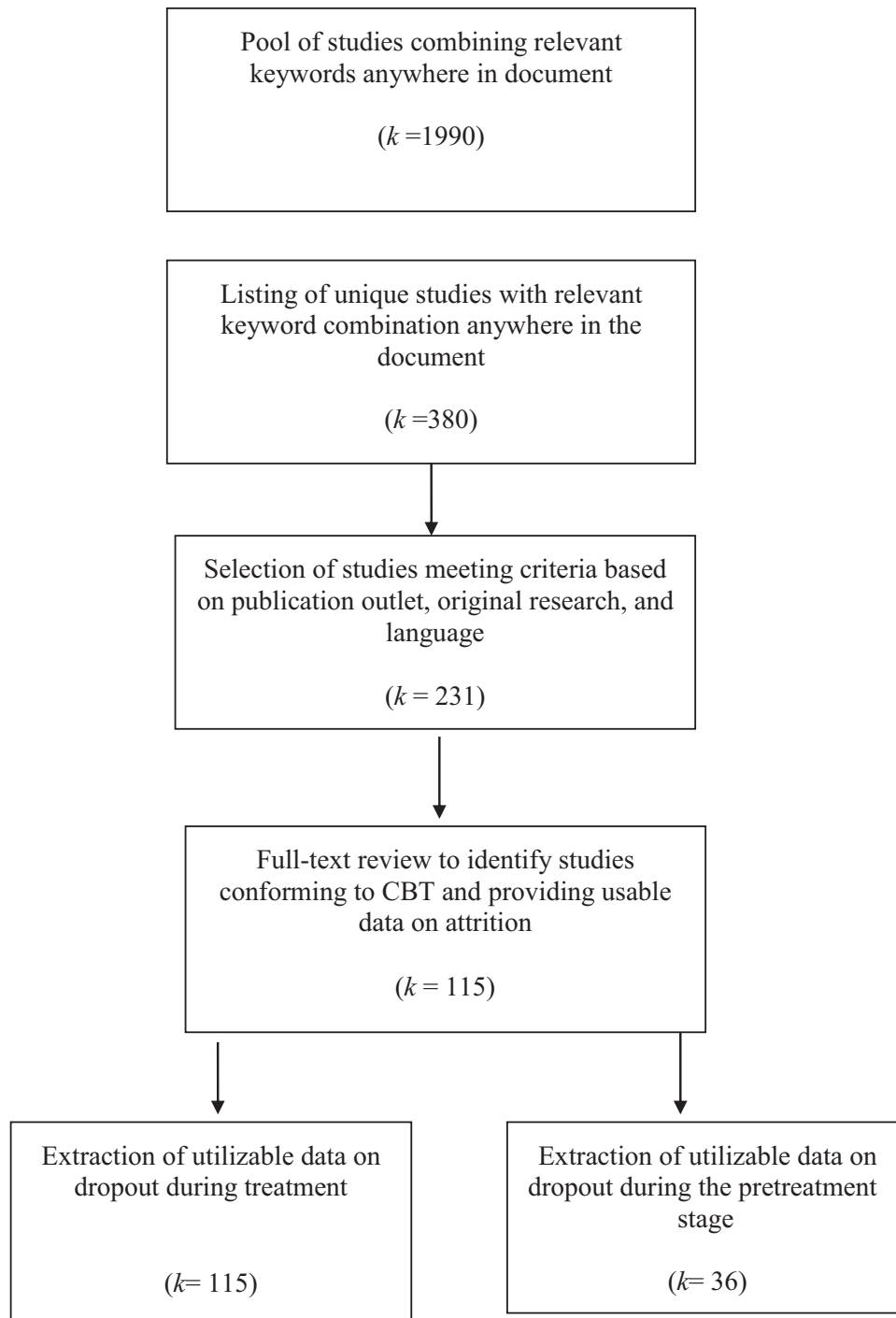| Extraction of utilizable data on dropout during treatment	Extraction of utilizable data on dropout during the pretreatment stage
(k= 115)	(k= 36)

Figure 1.   Flow chart of literature search strategy for identification of studies.

Data Reduction and Coding Procedures

The original sample size, number of treatment sessions offered, and dropout rates relative to timing were entered study by study in an Excel spreadsheet. The diagnosis of the sample was noted according to terminology adopted in the articles and then grouped into broader categories (e.g., depression, anxiety, eating disorders).

Treatment delivery format was coded as individual, group, or e-therapy. Client type was coded as child/adolescent or adult, and therapist type was coded as trainee or licensed or a mixed group of both trainees and licensed therapists. Setting was listed as inpatient, outpatient, or miscellaneous. Study design was categorized as randomized controlled trial (RCT) or non-RCT. Finally, the number of years since publication of the study was also specified.

All numerical and nominal data were independently extracted by two members of the research team. Cohen's kappa coefficients ranged from 0.89 to 0.99, indicating very high interrater agreement. In the few instances of discrepant coding, a third member of the research team was also consulted to achieve consensus by discussion.

Data Analyses

The primary aim of this meta-analysis was to calculate average dropout rates that occur prior to the start of treatment (failure to initiate) and during treatment (failure to complete) for the included studies of CBT. First, a weighted average pretreatment dropout rate (number of clients who agreed to treatment, but discontinued prior to the first treatment session) was calculated. Only 36 of the included studies provided data on pretreatment dropout. Second, a weighted average during treatment dropout rate (number of clients who discontinued treatment prematurely after attending at least one session) was calculated based on data from all 115 included studies. Given the heterogeneity of methods and clients for the studies that were included in this review, a random effects model was used in these calculations. The stability of the calculated rates was also tested by calculating the rates that would be obtained by removing one study at a time and recalculating the weighted average. Homogeneity in the study dropout rates at both time points was then tested using the Q statistic and an I^2 value was also calculated in order to illustrate the degree of heterogeneity using a percentage. Next, six categorical variables (diagnosis, therapy format, client type, therapist type, therapy setting, and study design) were tested as potential moderators using a Q test for both types of dropout. A mixed-effects model was used for the moderator tests given that subgroups were hypothesized to differ in their dropout rates. In these tests, the Q statistic is analogous to testing for group differences with analysis of variance in primary research. Last, two metaregression analyses were used to test the number of sessions offered and years since publication as covariates for both types of dropout (pretreatment and during treatment). A random effects model (method of moments) was used for the metaregres-

sion analyses due to the expected variance between studies. In these tests, a regression coefficient was calculated and a corresponding z-statistic was used to test for significance. The program Comprehensive Meta-analysis (Version 2), developed by Borenstein, Hedges, Higgins, and Rothstein (2005), was used for all of the data analyses.

Results

Weighted Dropout Rates

The average weighted pretreatment dropout rate for the 36 studies that included this type of data was 15.9%, 95% confidence intervals (CIs) [13.4%, 18.8%]. Removing one study per pass, the average weighted pretreatment dropout rate ranged from 15.0% to 16.5%, suggesting a high level of stability with the overall rate that was found. Although the average rate was stable, the studies were found to be highly heterogeneous in their pretreatment dropout estimates, $Q(35) = 167.92$, $p < .001$, $I^2 = 79.16\%$, with pretreatment dropout rates ranging from 0% to 46.88%. This high degree of heterogeneity suggests that the rates of pretreatment dropout in CBT may differ depending on potential moderators of the study.

The average weighted during treatment dropout rate for the 115 included studies was 26.2%, 95% CIs [23.1%, 29.7%]. Removing one study per pass, the average weighted rate ranged from 25.8% to 26.6%, also suggesting a high level of stability with the overall during treatment dropout rate that was found. Although the average during treatment dropout rate was stable, the studies were found to be highly heterogeneous in their estimates, $Q(114) = 2562.23$, $p < .001$, $I^2 = 95.55\%$, with pretreatment dropout rates ranging from 0% to 83.78%. This high degree of heterogeneity suggests that the rates of pretreatment dropout in CBT may differ depending on potential moderators of the study.

Moderator and Covariate Analyses

Diagnosis. Table 1 reports the results testing whether diagnosis was a moderator of pretreatment and during treatment dropout

Table 1
Dropout Rate by Type of Disorder

Disorder group	k	Dropout rate	95% CI
Pretreatment dropout, $Q(6) = 13.55$, $p < .05$			
Anxiety disorders	6	11.4%	[6.3%, 19.8%]
Depression	6	21.6%	[15.9%, 28.6%]
Eating disorders	6	16.2%	[12.5%, 20.8%]
Psychotic disorders	4	5.6%	[1.6%, 18.0%]
PTSD	2	7.8%	[4.0%, 14.9%]
Substance abuse and other addictions	2	14.5%	[4.7%, 36.7%]
Variable/other disorders	10	18.5%	[12.4%, 26.7%]
During treatment dropout, $Q(7) = 26.55$, $p < .001$			
Anxiety disorders	23	19.6%	[15.9%, 23.8%]
Comorbid anxiety and depression	4	28.0%	[17.9%, 41.1%]
Depression	15	36.4%	[22.6%, 52.9%]
Eating disorders	22	31.0%	[27.5%, 34.7%]
Psychotic disorders	10	20.1%	[11.6%, 32.7%]
PTSD	6	27.2%	[15.6%, 43.1%]
Substance abuse and other addictions	8	36.4%	[28.9%, 44.5%]
Variable/other disorders	27	23.7%	[19.1%, 29.1%]

Note. CI = confidence interval; PTSD = posttraumatic stress disorder.

Table 2
Dropout Rate by Treatment Format

Treatment format	k	Dropout rate	95% CI
Pretreatment dropout, $Q(2) = 18.77$, $p < .001$			
Individual	11	9.7%	[6.9%, 13.6%]
Group	10	14.5%	[9.7%, 21.0%]
e-therapy	8	24.2%	[18.8%, 30.6%]
During treatment dropout, $Q(2) = 2.09$, $p > .05$			
Individual	27	25.1%	[20.6%, 30.2%]
Group	32	24.6%	[19.9%, 30.1%]
e-therapy	17	34.2%	[22.5%, 48.3%]

Note. CI = confidence interval.

rates. Significant differences in pretreatment dropout rates between the diagnostic groups were found, $Q(6) = 13.55$, $p < .05$. Although studies of CBT for depression ($k = 6$) had an average pretreatment dropout rate of 21.6%, studies of CBT for psychotic disorders ($k = 4$) only had an average pretreatment dropout rate of 5.6% and studies of CBT for PTSD ($k = 2$) only had an average dropout rate of 7.8%. Significant difference in dropout rates during treatment were also found for the different diagnostic groups, $Q(7) = 26.55$, $p < .001$. Although studies of CBT for depression ($k = 15$) had an average during treatment dropout rate of 36.4%, studies of CBT for anxiety ($k = 23$) only had an average during treatment dropout rate of 19.6% and studies of CBT for psychotic disorders ($k = 10$) had an average treatment dropout rate of 20.1%.

Format. Table 2 reports the results testing whether individual, group, and electronic formats differed in their rates of dropout, both at pretreatment and during treatment. Of the 36 included studies that reported pretreatment dropout rates, 29 included information on treatment format. There was a significant difference in pretreatment dropout rates among the three treatment formats, $Q(2) = 18.77$, $p < .001$. Specifically, pretreatment dropout rates in e-therapies were 10 to 15 percentage points higher than dropout rates for in-person individual or group therapies. Of the 115 included studies that reported during treatment dropout rates, only 76 included information on treatment format. There was not a significant difference in during treatment dropout rates between the three format types, $Q(2) = 2.09$, $p > .05$. Although not significant, during treatment dropout rates in e-therapies were about 10 percentage points higher than dropout rates for the in-person treatments.

Client type. We next compared rates of pretreatment and during treatment dropout between adult and child/adolescent clients. The rate of pretreatment discontinuation was 15.9%, CI 95% [13.2%, 19.0%] for studies with adult clients ($k = 31$), and 18.5%, CI 95% [10.1, 31.5%] for studies with child/adolescent clients ($k = 4$). This was not a significant difference, $Q(1) = 0.25$, $p > .05$. During treatment, the rate of premature termination was 25.8%, 95% CI [22.4%, 29.6%] for studies with adult clients ($k = 97$), and 28.8%, 95% CI [21.8%, 36.9%] for studies with child/adolescent clients ($k = 16$). This also was not a significant difference, $Q(1) = 0.50$, $p > .05$.

Therapist type. The type of therapist in the study (trainee, experienced/licensed, mixed trainee and experienced) was also tested as a potential moderator of the study rates of dropout. Prior to starting treatment, studies with trainees ($k = 2$) had a discontinuation rate of 15.9%, 95% CI [4.1%, 45.4%], studies with experienced/licensed therapists ($k = 21$) had a discontinuation rate of 14.6%, 95% CI [11.5%, 18.3%], and studies with both trainees and experienced/licensed therapists had a discontinuation rate of 16.2%, 95% CI [10.5%, 24.2%]. These small differences in discontinuation rates were not significant, $Q(2) = 0.19$, $p > .05$. During treatment, there was also not a significant difference in dropout rates, $Q(2) = 0.04$, $p > .05$, between studies with trainees ($k = 12$, *event rate* = 27.2%, 95% CI [16.9%, 40.7%]), studies with experienced/licensed therapists ($k = 76$, *event rate* = 26.6%, 95% CI [23.9%, 29.6%]), and studies with both trainees and experienced/licensed therapists ($k = 18$, *event rate* = 27.7%, 95% CI [17.5%, 41.0%]).

Setting. Table 3 reports the results testing whether pretreatment and during treatment rates of premature termination differ among studies conducted in inpatient, outpatient, and other settings. Thirty of the 36 studies with pretreatment dropout data included information on the setting. In summary, there was a

Table 3
Dropout Rate by Treatment Setting

Setting	k	Dropout rate	95% CI
Pretreatment dropout, $Q(2) = 7.44$, $p < .05$			
Inpatient	2	8.4%	[2.7%, 22.9%]
Outpatient	21	14.6%	[11.9%, 17.8%]
Other	7	23.3%	[16.9%, 31.3%]
During treatment dropout, $Q(2) = 6.67$, $p < .05$			
Inpatient	10	18.9%	[13.7%, 25.5%]
Outpatient	79	26.0%	[21.8%, 30.8%]
Other	25	29.5%	[25.1%, 34.4%]

Note. CI = confidence interval.

significant difference in discontinuation prior to starting therapy among the three settings, $Q(2) = 7.44$, $p < .05$, with studies conducted in an inpatient setting reporting the lowest rates. During treatment, there was also a significant difference in dropout rates, $Q(2) = 6.67$, $p < .05$. Again, studies conducted in an inpatient setting reported lower dropout rates compared with those conducted in an outpatient or other setting.

Study design. We also compared dropout rates between studies utilizing an RCT design to studies of some other design. Prior to starting therapy, on average 16.1%, 95% CI [12.7%, 20.2%] of clients dropped out of studies not using an RCT design ($k = 16$) and 14.9%, 95% CI [11.2%, 19.6%] of clients dropped out studies using an RCT design ($k = 20$). This small difference was not significant, $Q(1) = 0.17$, $p > .05$. There was also not a significant difference, $Q(1) = 1.07$, $p > .05$, in during treatment dropout rates between non-RCT studies ($k = 55$, *event rate* = 27.9%, 95% CI [25.1%, 30.9%]), and RCT studies ($k = 59$, *event rate* = 24.2%, 95% CI [18.7%, 30.8%]).

Number of sessions. Of the 35 included studies that reported pretreatment dropout rates, 27 included information on the number of sessions. The number of sessions in these studies ranged from 5 to 48. In these studies, the relationship between number of sessions and the rate of dropout was not significant (slope = 0.01, 95% CI [−0.02, 0.03], $z = 0.74$, $p > .05$). Of the 115 included studies that reported during treatment dropout rates, 89 included information on the number of sessions. The number of sessions in these studies also ranged from 5 to 48. In these studies, the relationship between number of sessions and the rate of dropout was significant (slope = −0.03, 95% CI [−0.05, 0.00], $z = 1.98$, $p < .05$). Specifically, for each additional session that was included in the treatment, there was a .03 decrease in the log proportion of clients who dropped out.

Year of publication. The relationship between years since publication and the rate of dropout during treatment was not significant (slope = 0.00, 95% CI [−0.04, 0.04], $z = 0.06$, $p > .05$), thus indicating that rates of pretreatment dropout have not been changing over time. The relationship between years since publication and the rate of dropout during treatment was also not significant (slope = −0.00, 95% CI [−0.04, 0.03], $z = 0.21$, $p > .0$), thus indicating that rates of premature termination have not be increasing or decreasing over time.

Discussion

A substantial evidence base has accumulated in favor of CBT for a range of disorders. However, this efficacy may be tempered by attrition, which is a pervasive issue in many psychological and medical treatments as well as educational systems. A meta-analysis was performed on 115 studies containing relevant and usable information on dropout from CBT. To answer the specific question about timing of dropout, pretreatment dropout rates were aggregated across a subset of 36 studies (see Figure 2) for comparison with during treatment dropout rates aggregated across all 115 studies (see Figure 3). Effect sizes thus obtained were subjected to further analyses of key moderator variables. First, diagnosis was examined in relation to dropout. Second, treatment duration (number of sessions) was examined as a possible moderator variable. Third, dropout rate was examined as a function of the format of treatment—traditionally distinguished in terms of group
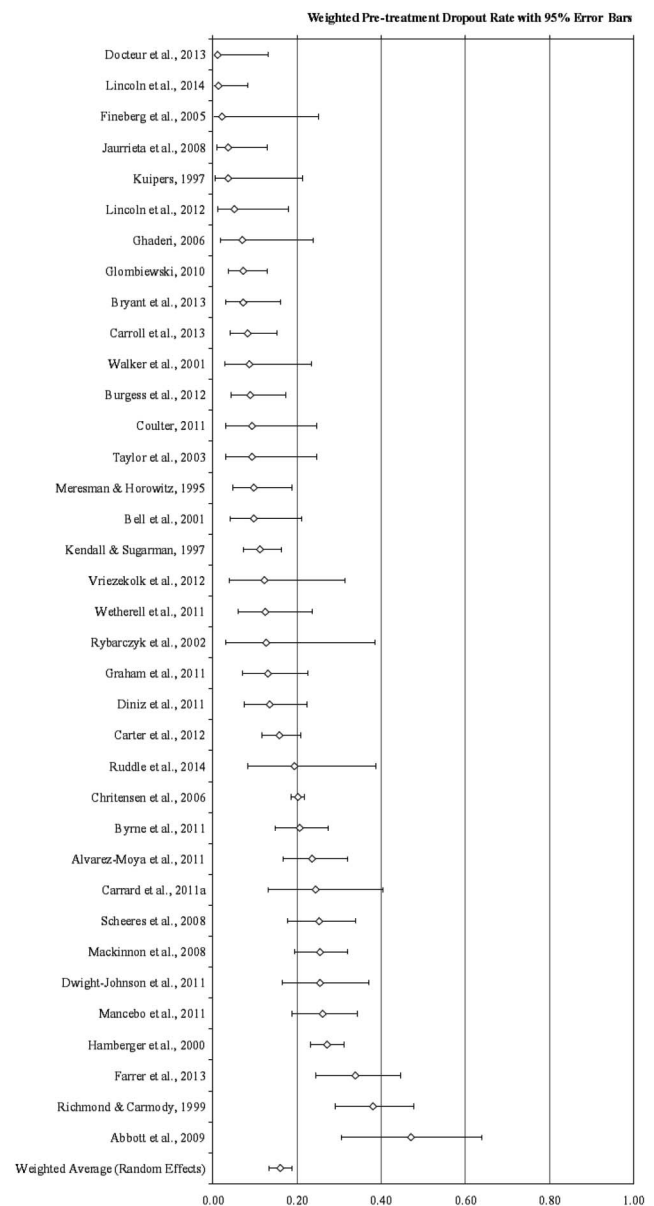

Figure 2. Weighted pretreatment dropout rate with 95% error bars.

versus individual therapy, but (more recently) also taking the form of e-therapy. Further explored was the role of client type (child/adolescent vs. adult), therapist type (trainee vs. licensed), treatment setting (inpatient vs. outpatient), study design (RTC vs. non-RTC), and years since publication of the study.

Our meta-analysis revealed that the average weighted pretreatment dropout rate (for the 36 studies including such data) was 15.9%, 95% CIs [13.4%, 18.8%], and the average weighted during treatment dropout rate (across all 115 studies) was 26.2%, 95% CIs [23.1%, 29.7%]. Evidently, the attrition was about 10% higher once treatment started than before treatment started. Even when percentage dropout during treatment was calculated relative to the original sample size (before pretreatment attrition), the loss of participants over the course of treatment clearly exceeded that
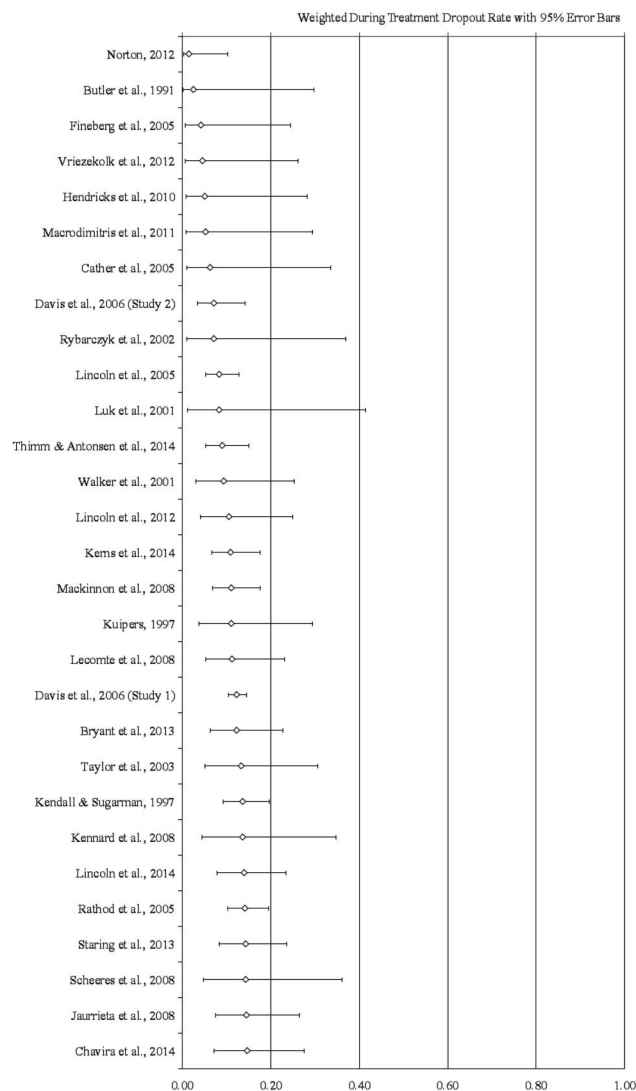
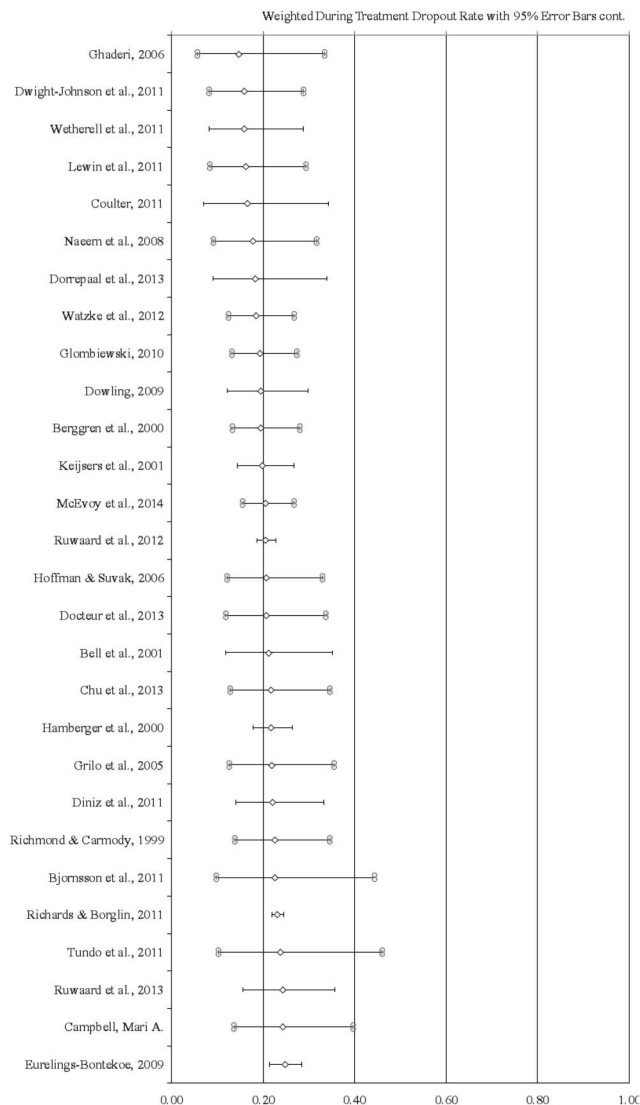*Figure 3.* Weighted during dropout rate with 95% error bars.

Figure 3. (*continued*)

observed prior to treatment. The average total dropout rate across both the pretreatment and treatment phases was about 35% (to see both pretreatment and during treatment data for the 35 studies that included information on both, refer to Figure 4). This dropout rate falls near the midpoint in the attrition range of 19%-50% found by Salmoiraghi and Sambhi (2010) in their narrative review of 14 studies of dropout in CBT.

In the largest meta-analysis undertaken on dropout rates in adult psychotherapy (Swift & Greenberg, 2012), the loss of subjects in the treatment stage was 19.7%, which is a little lower than the 26.2% found here. This may not imply that forms of psychotherapy other than CBT have lower attrition rates, as Swift and Greenberg (2012), did have a preponderance of CBT studies in their analyses. More likely, the slight disparity is due to different exclusion criteria. For instance, unlike the Swift and Greenberg meta-analysis, the present meta-analysis did not exclude studies involving substance abuse, children and adolescents, nor studies including newer formats for the delivery of therapy (in particular

Internet-directed therapy), which as indicated earlier, was associated with higher rates of dropout. Notably, however, our observed dropout rate during treatment is almost identical to the during treatment dropout rate of 26% found by van Ingen et al. (2009) in their quantitative review of 11 CBT studies deemed relevant to real world practice.

Both the pretreatment and during treatment dropout rates in this study had a high degree of stability, although they were highly heterogeneous across studies, suggesting possible moderator variables. One significant moderator of dropout was diagnosis. Among all the disorders represented across the studies, depression was associated with the highest pretreatment as well as during treatment dropout rates: 21.6% and 36.4%, respectively (although clients being treated for substance abuse and other addictions also had a 36.4% during treatment dropout rate). The 36.4% during treatment dropout rate for depressed patients found here is notably greater than the 24.6% during
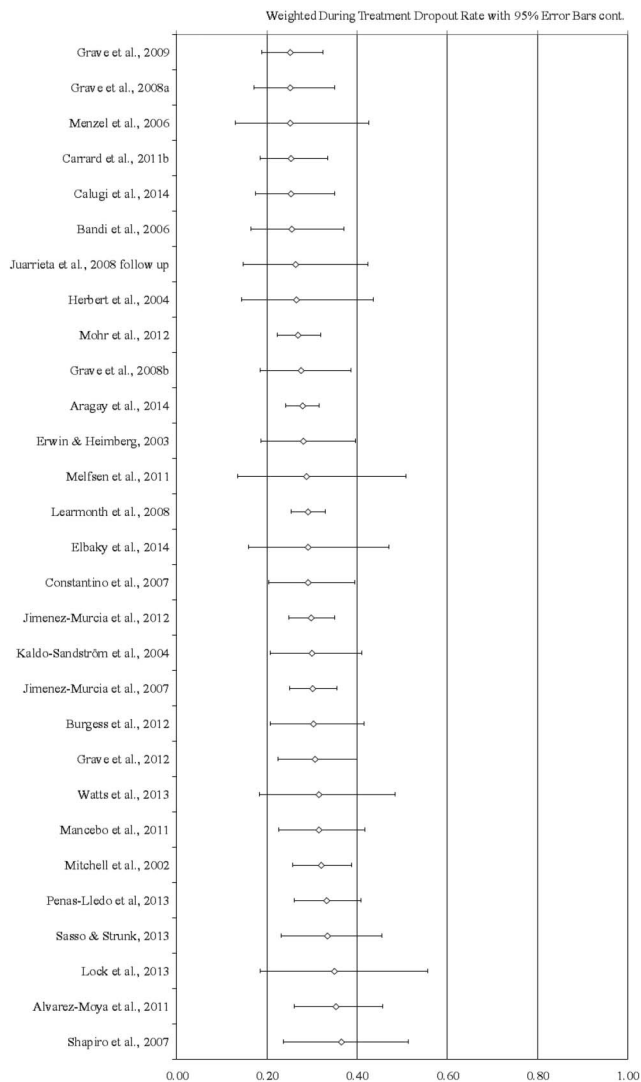
Weighted During Treatment Dropout Rate with 95% Error Bars cont.

Figure 3. (*continued*)

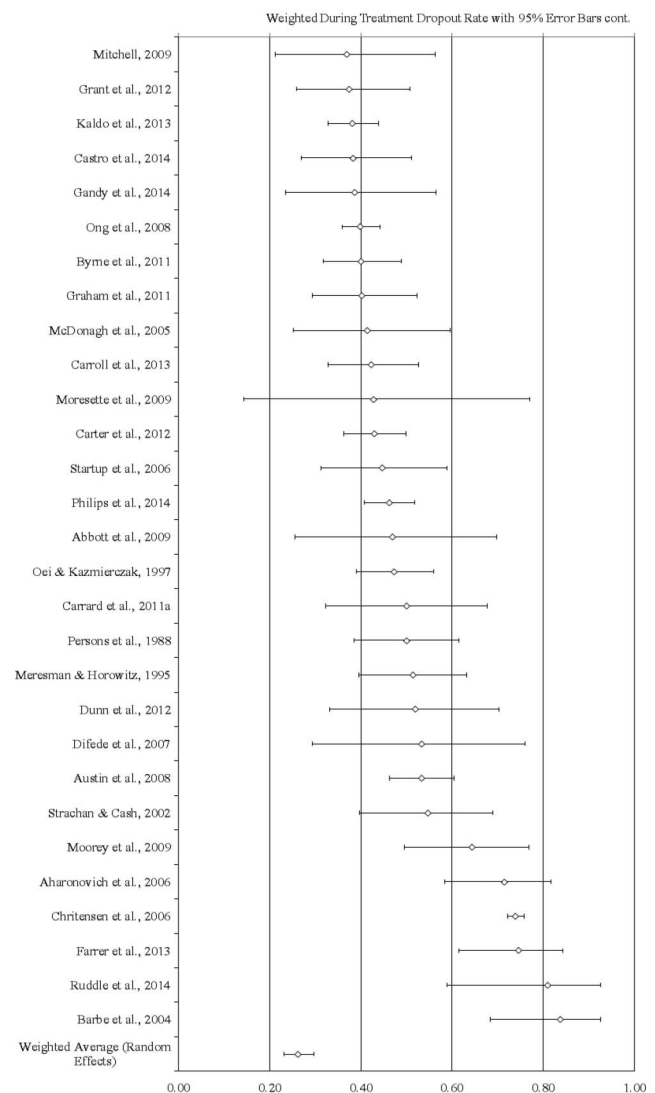Weighted During Treatment Dropout Rate with 95% Error Bars cont.

Figure 3. (*continued*)

treatment dropout recently reported by Hans and Hiller (2013a) in a meta-analysis of 34 studies of CBT for depression. It should be noted that Hans and Hiller drew only from nonrandomized trials that were intended to be representative of routine clinical practice. Their sample of studies also included numerous dissertations and other studies not necessarily published in English. On the other hand, the present meta-analysis included RCTs as well as nonrandomized trials of CBT for depression but excluded dissertations. In other words, the lower level of methodological rigor commonly attributed to non-RCTs and unpublished dissertations may have led to an underestimate of attrition. Of all the diagnostic groups considered, the lowest pretreatment attrition was associated with psychotic disorders (5.6%) and PTSD (7.8%). Similarly, the lowest during treatment attrition was associated with anxiety disorders (19.6%) and psychotic disorders (20.1%).

One possible explanation for the high attrition rate among those with depression compared with other mental disorders may lie in

the very symptomology of depression. Diminished hope, social withdrawal, and psychomotor slowing may act in concert to vitiate levels of interest in therapy. They may further hinder therapeutic alliance, which is pivotal to retention in therapy. In contrast, the relatively higher rates of retention among those with psychoses may be because they are more often treated in an inpatient context where dropping out is less of an option. Intermediate rates of dropout were observed for PTSD, which averaged about 17.5% across both phases, a result very close to the 16.7% reported by Kliem and Kröger (2013) in their meta-analysis of CBT for PTSD.

Another significant moderator of dropout was the format of treatment. Pretreatment and during treatment dropout rates were about 10 to 15 percentage points higher for e-therapies (including Internet, phone, and CD-based treatments) than for group or individual therapy. Though this trend held for both phases, the difference was only significant in the pretreatment phase and not for those who had already started treatment. The lower
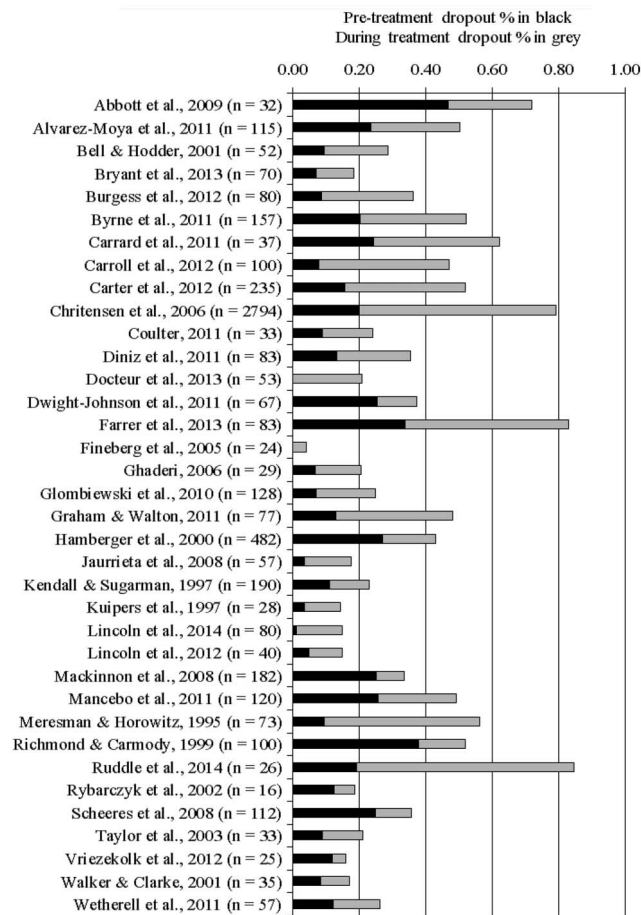
Figure 4. Percent dropout pre- versus during treatment for 35 studies.

pretreatment attrition in individual compared with group therapy is consistent with earlier findings in psychotherapy including CBT (e.g., Pinquart, Duberstein, & Lyness, 2007). What is new is that e-therapy had the highest attrition rate. Perhaps those considering the prospect of such therapy may have been ambivalent about its potential utility. Even if they commenced, they were less inclined to stay in e-therapy compared with in-person therapy, possibly because of limited therapeutic alliance. It is also possible that use of such technology as CD-ROMs and computers to deliver therapy may leave the client with a diminished sense of accountability and engagement in the therapeutic process.

The duration of treatment, or the number of sessions to be delivered was significantly associated with during treatment dropout. For each additional session that was included in the treatment, there was a .03 decrease in the log proportion of clients who dropped out. Specifically, it was found that the greater the number of sessions planned, the lower the attrition of subjects over the course of treatment. Perhaps, the promise of many sessions raised hopes of better outcomes at least in those participants who had already taken the first step of starting treatment.

The only other variable having a significant correlation with dropout was treatment setting. Inpatient settings had a significantly lower rate of pretreatment and during treatment dropout compared with outpatient or other settings. In general, inpatient settings register lower attrition than their outpatient counterparts (e.g., Fassino, Pierò, Tomba, & Abbate-Daga, 2009). This may be due to more opportunities for therapeutic services and for appropriately regulating the environment in a residential treatment facility than the home environment.

The variables that were not significantly associated with dropout may be as interesting and noteworthy as those that were significantly correlated. Study design, client type, therapist type, and recency of publication of a study were not significant moderators of dropout, though this should not be taken as rejection of the research hypothesis but a retention of the null hypothesis. With regard to study design, RCTs did not differ significantly from non-RCTs in dropout rates. Apparently, methodological rigor does not guarantee clients' commitment to complete therapy. The former may live up to the researcher's standards but staying the course of therapy hinges greatly on the client's outlook. The further finding that dropout did not differ significantly according to the provider's credentials may be because those in training were only marginally different from those who were licensed. With regard to adult versus child/adolescent clients, dropout was not significantly different though consistently higher in the latter group. This is in keeping with the bulk of research on psychotherapy. Finally, on the issue of age of published studies, no significant relationship was found in dropout. Unlike the meta-analysis by Swift and Greenberg (2012), which reported lower dropout rates now than two decades ago, our analysis found that dropout rate was virtually invariant with age of study. This may be because of restriction of range, as the vast majority of the 115 studies we reviewed were published over the past 10 years.

Clinically, the present findings suggest that there are several weak links in the retention of clients in CBT. The first is during the waiting phase itself, that is between the offer of treatment and its commencement. Engaging and encouraging the client may have to begin even before treatment begins. This may be seen as a preparatory phase to enhance readiness by approaches such as motivational interviewing (Miller & Rollnick, 2002; Swartz et al., 2007). Second, certain populations are at greater risk of waning motivation, and those with depression warrant special attention in this regard. As far as treatment duration, the planned number of CBT sessions is a proxy for dosage, and a higher dosage may instill greater hope in clients receiving therapy. Finally, with regard to treatment format, the new era of Internet-based therapies has ushered a certain convenience of access to services, but caution needs to be exercised concerning the risk for premature termination. Where individual and group therapy are simply not feasible, e-therapy may be a last resort. Otherwise, it may be sustainable if supplemented with intermittent sessions of actual in-person therapy whether in groups or individually.

Limitations

One limitation of research on this topic is the variation in operational definitions of dropout. As has been recurrently noted (e.g., Wierzbicki & Pekarik, 1993; Reis & Brown, 1999), this may well be responsible for the variability in results. In imposing a standardized definition of dropout, the present meta-analysis may

have incurred some loss of data. For example, if those not showing up for screening were grouped as dropouts along with those who terminated treatment, this was viewed as a confounding of pretreatment and during treatment attrition and therefore the study was omitted.

The final collection of 115 studies was obtained after culling from an even larger pool of more than 300 studies of CBT. Numerous studies either did not report usable data on dropout or else were ambiguous as to whether the dropout was in a CBT group, a mixed treatment group, or a control group. Others were unclear about the phase of treatment in which dropout occurred. Wherever possible, every effort was made to recognize nuances and to make judgments according to a standardized application of criteria by multiple members of the research team. Ultimately, a common definition of dropout was adopted for present purposes. For pretreatment dropout, it was failure to move forward or attend the first session after being screened and having accepted treatment. For during treatment dropout, it was failure to complete treatment after attending the first session. As for the criteria for CBT, there was less ambiguity, though some studies used it in combination with other therapies including pharmacological treatments. If the dropout data were inextricably confounded, such multitreatment studies were excluded. The result was somewhat of an attrition in the sample size for this meta-analysis.

Considerations for Future Research

As mentioned earlier, the literature on dropout has been particularly nuanced in definition, methodology, and reporting style. The present meta-analysis represents an attempt to synthesize data in a standardized way across a substantial subset of studies on dropout in CBT as a function of timing, diagnosis, treatment duration, treatment delivery format, setting, and other variables. With specific reference to timing of dropout, we have focused on pre- and during treatment phases, but future researchers can extend their scope to posttreatment attrition or the failure to attend follow-up. Additionally, there is an unsettled issue of how to categorize subjects who discontinue therapy for reasons such as illness, transportation difficulties, affordability issues, and other practical barriers to treatment. These may be taken up in future empirical investigations in this field and at least they may offer a heuristic for further discussion.

Furthermore, the search for additional moderator variables would help advance this field. After all, there was significant heterogeneity in the effect sizes as in other meta-analyses. Client variables such as psychological mindedness, therapeutic alliance, and readiness or motivation for treatment are often recognized as relevant though not always measured systematically. Sociodemographic factors such as socioeconomic status, age, sex, ethnicity, marital status, occupation, and educational background have been variously identified as having explanatory value in this field. Although no single variable in this list is likely to hold the key to attrition, collectively, these may account for a larger portion of the variance. In the long run, this aggregate of variables can help to direct the clinician to a host of appropriate strategies for minimizing attrition and improving outcome in therapy (Swift & Greenberg, 2015).

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Call for Nominations

The Publications and Communications (P&C) Board of the American Psychological Association has opened nominations for the editorships of *Emotion; Experimental and Clinical Psychopharmacology; Journal of Comparative Psychology; Journal of Experimental Psychology: Human Perception and Performance; Journal of Experimental Psychology: Applied; Journal of Abnormal Psychology; Journal of Personality and Social Psychology: Attitudes and Social Cognition; Journal of Counseling Psychology* and *Rehabilitation Psychology* for the years 2018–2023. David DeSteno, PhD; Suzette Evans, PhD; Josep Call, PhD; James T. Enns, PhD; Neil Brewer, PhD; Sherryl Goodman, PhD; Eliot Smith, PhD; Terence Tracey, PhD and Stephen Wegener, PhD respectively, are the incumbent editors.

Candidates should be members of APA and should be available to start receiving manuscripts in early 2017 to prepare for issues published in 2018. Please note that the P&C Board encourages participation by members of underrepresented groups in the publication process and would particularly welcome such nominees. Self-nominations are also encouraged.

Search chairs have been appointed as follows:

- *Emotion,* Co-chairs: Pamela T. Reid, PhD and Jennifer Crocker, PhD
- *Experimental and Clinical Psychopharmacology,* Chair: Mark Sobell, PhD
- *Journal of Comparative Psychology,* Co-Chairs: Stephen Rao, PhD and Gary VandenBos, PhD
- *Journal of Experimental Psychology: Human Perception and Performance*, Co-chairs: Wendy A. Rogers, PhD and Gary VandenBos, PhD
- *Journal of Experimental Psychology: Applied,* Chair: Neal Schmitt, PhD
- *Journal of Abnormal Psychology,* Chair: Annette La Greca, PhD
- *Journal of Personality and Social Psychology: Attitudes and Social Cognition,* Chair: David Dunning, PhD
- *Journal of Counseling Psychology, C*hairs: Kate Hays, PhD
- *Rehabilitation Psychology*, Co-chairs: James C. Quick, PhD and Gary VandenBos, PhD

Candidates should be nominated by accessing APA's *EditorQuest* site on the Web. Using your Google Chrome Web browser, go to http://editorquest.apa.org. On the Home menu on the left, find "Guests." Next, click on the link "Submit a Nomination," enter your nominee's information, and click "Submit."

Prepared statements of one page or less in support of a nominee can also be submitted by e-mail to Ieshia Haynie, P&C Board Search Liaison, at ilhaynie@apa.org.

Deadline for accepting nominations is Friday, January 29, 2016, after which phase one vetting will begin.