

THERAPIST PREDICTORS OF TREATMENT COSTS AND OUTCOMES IN A
PSYCHOLOGY TRAINING CLINIC: A MULTI-PERSPECTIVE
COST-EFFECTIVENESS EVALUATION

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ABSTRACT

Costs are a barrier to both providing and receiving mental health services. The present study evaluated the costs, effectiveness, and cost-effectiveness of cognitive-behavioral therapy (CBT) delivered in a training clinic (TC) at a private Mid-Atlantic university from the therapist, client, and summed perspectives. Although extant literature suggests that therapists differ in their treatment effectiveness, years of clinical experience has not consistently predicted treatment outcomes. We attempted to replicate findings that therapists, but not years of experience, have a statistically significant impact on self-reported distress. We also sought to extend this literature by examining effects of therapists and therapist clinical experience in a sample of predoctoral trainees in their 2nd or 3rd year of clinical training delivering CBT in a TC. Treatment costs were higher for 3rd-year, compared to 2nd-year, therapists from all perspectives. Also, treatment length interacted with therapist experience to significantly predict costs from the therapist perspective. A three-level hierarchical linear growth model revealed that approximately 10.6% of variance in outcomes was accounted for by between-therapist differences, therapist experience did not significantly predict distress reductions, and higher distress at baseline was associated with faster distress reductions. A probabilistic sensitivity analysis confirmed conclusions that therapists with two years of experience may be more cost-effective than therapists with three years of experience. However, CBT may be more cost-effective when delivered by 3rd-year therapists,

relative to 2nd-year therapists, if decisionmakers are willing to pay an additional \$35 to \$60 for an additional one-point reduction on the OQ.

Keywords: cost-effectiveness; cognitive-behavioral therapy; training clinic; therapist experience; hierarchical linear modeling.

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CHAPTER 1

INTRODUCTION

The American Psychological Association (APA) and Psychological Clinical Scientist Accreditation System (PCSAS) aim to train future scientist-practitioners and clinical scientists to provide evidence-based treatment that is not only effective, but cost-effective (APA, 2006; PCSAS, 2019). In the United States, 168 psychology training clinics (TC)¹ are housed within universities that provide masters or doctoral-level degrees in clinical psychology, counseling psychology, school psychology, or social work (Dyason et al., 2019; Stevenson & Norcross, 1985; Todd et al., 1994). TCs serve as training settings for student therapists, treatment settings for community members, and research settings for clinical scientists. Due to their multiple functions, TCs are in a unique position to collect and analyze treatment outcome and cost data in pursuit of the APA's and PCSAS's missions.

Reviews of research conducted in TCs highlight how the amount of therapist- and client-level data available for systematic research is usually more plentiful in training clinics than in other outpatient settings because of the ethical requirement to provide proper oversight of students, such as by recording therapy sessions (Borkovec, 2004; Dyason et al., 2019; Peterson & Fagan, 2017; Stevenson & Norcross, 1985). Although the Association of Psychology Training Clinic Directors does not track the type of therapy that TCs provide, the scientist-practitioner and clinical-scientist (PCSAS, 2019) training models of many graduate programs that house TCs prioritize delivery of evidence-based treatment, such as cognitive behavioral therapy (CBT).

¹ A training clinic is different from a college counseling center. Although many college counseling centers also serve as clinical training sites for students, counseling centers are a) not exclusively staffed by trainees b) usually free-of-charge to the student body, and c) exclusively provide services to students attending the home university.

Such training models also emphasize implementation of standardized treatment outcome measures (Overington et al., 2015). According to a 2017 survey, 67% of TCs in the U.S. collect treatment outcome data (Peterson & Fagan, 2017). The routine monitoring of treatment outcomes is also more common in TCs compared to standard outpatient clinics, making TCs uniquely situated for treatment outcome research (Peterson & Fagan, 2017). Additionally, the resources and treatment model unique to TCs also provide an ideal setting in which to explore whether treatments that are efficacious in randomized controlled trials can prove effective under the less controlled and more realistic conditions of a TC (Kazdin et al., 1986; Neufeldt & Nelson, 1998).

Therapist characteristics have been shown to impact client treatment outcomes, but the specific characteristics that predict positive treatment outcomes remain unclear. Attainment of a master's degree (Prout & DeBerard, 2017), number of direct intervention hours at therapy termination (Driscoll et al., 2003; Powell et al., 2010), number of practicum experiences, and number of days in a doctoral program (Powell et al., 2010) are related to treatment outcomes such as improved general distress scores, treatment goal attainment, and global functioning. These findings, however, are exceptions to a wealth of data showing that years of training are unrelated to client outcomes within and outside of TCs (e.g. Carr et al., 2017; Christensen & Jacobsen, 1994; Franklin et al., 2003).

The Phase Model of psychotherapy suggests that improvements in client well-being lead to reduced psychological distress and, subsequently, improved functioning (Howard et al., 1993; Stulz et al., 2007). Measures of symptom distress, in particular, are among the most commonly-used outcome measures in psychotherapy outcome studies (Barkham et al., 1998). One variable that has been underexplored as a predictor of treatment effectiveness, despite having an indirect relationship to client outcomes, is treatment cost. Evaluating a treatment's cost-effectiveness, or

the relationship between its costs and its effectiveness, can help stakeholders make informed choices about how to optimize the use of their restricted resources. A treatment can be considered cost-effective if it (a) produces similar results to another treatment at a lower cost, (b) produces more favorable results than another treatment at a similar cost, or (c) produces slightly less favorable outcomes than another treatment at a substantially lower cost (Fishman, 1975).

Resource constraints are cited as the primary barrier to collecting treatment outcome data by directors of TCs that do not collect such data (Peterson & Fagan, 2017; Stevenson & Norcross, 1985). These findings suggest that the more resources a TC has, the easier it is to implement treatment outcome measures. In addition, clients whose therapists monitor treatment outcomes report greater improvements on the Outcome Questionnaire (OQ 45.2; Lambert et al., 1996), a measure of psychological distress, compared to therapists who do not monitor treatment outcomes (Anderson & Lambert, 2001; Knaup et al., 2009; Reese et al., 2009). In sum, increasing TC resources, such as money for routine treatment outcome monitoring, can facilitate treatment evaluation and improve treatment outcomes.

The type (e.g., time and building space), and amount (e.g., one hour or one ft²) of resources that are used for treatment activities (e.g., a psychotherapy session) produce outcomes of interest and determine a treatment's total cost (Yates, 1996). Using this resource → activity → outcome model helps decisionmakers understand and disseminate effective treatment to reach more clients (Yates, 1996). Documenting the resources needed to develop and sustain a TC that monitors treatment outcomes can also help universities without a TC decide whether they have the resources for such a clinic.

Although resources constraints may have an indirect impact on client outcomes, neither costs nor the relationship between costs and effectiveness from a therapist's or client's

perspective have been systematically evaluated in TCs. A comprehensive review of the literature using the keyword search terms “psychology training clinic’ AND cost*” in PsycINFO, PubMed Central, and Academic Search Premier databases yielded one study, which found that the amount of money clients paid per session did not impact client therapy attendance, satisfaction with treatment, or symptom improvement (Aubry et al., 2000). This article only evaluated resources, such as out-of-pocket costs, that clients devote to receiving mental health services. The resources that clients, therapists, and universities use to provide and receive mental health services also differ by the perspective being evaluated. Both therapists and clients, for example, spend one hour in their individual therapy session. Therapists would spend that one hour providing therapy regardless of who they are providing it to. Clients, on the other hand, may lose productivity (i.e., miss time from paid employment) by traveling to and attending a therapy session. Clients may also need to pay for childcare in addition to out-of-pocket therapy session costs and insurance copays.

From the client perspective, out-of-pocket treatment costs can impact their ability to access treatment. People in need of mental health treatment cite high costs as the primary barrier to seeking mental health services (Substance Abuse and Mental Health Services Administration, 2014, p. 7). Evidence-based treatment such as CBT can be costly to provide due to the extensive personnel resources needed to train and supervise CBT therapists (McLellan et al., 2003).

According to the Association for Psychology Clinic Training Directors’ 2019 Clinical Psychology PhD Program - Clinic Revenue Benchmarking data, many TCs charge low fees for their services (E. A. Hart, personal communication, May 1, 2020). TCs have access to 1) university resources, such as facilities and licensed faculty members who provide training and supervision, as well as 2) psychology trainees who do not yet have the market value of licensed

mental health providers. Combined, these factors have the potential to reduce indirect (e.g., facilities, personnel resources, etc.) and direct (e.g., labor) TC costs, which can make its low-fee model sustainable. By delivering inexpensive, evidence-based mental health treatment, TCs can increase the accessibility of affordable, evidence-based mental health services. However, because costs from multiple perspectives have not been systematically examined in TCs, it is still unclear whether the low-fee business model of TCs translates into effective clinical practice, i.e., whether TCs provide cost-effective mental health treatment. It is important to note that a treatment that is low-cost treatment is not necessarily cost-effective, although these terms are frequently used interchangeably.

The present study used archival treatment outcome data collected from a TC housed within a private university and had three aims. The first aim was to identify the amount and monetary value of the resources needed to operate a TC. The second aim was to examine treatment effectiveness. Specifically, we examined how therapist experience affected the rate of client improvement over the course of treatment. In line with extant literature, we predicted that some variance in the rate of client symptom improvement will be significantly accounted for by therapists, but that therapist experience would not impact client outcomes. Originally, we planned to examine whether therapist competence, as rated by off-site practicum supervisors, significantly predicted OQ change over time. However, multiple different supervisor rating forms were used during the study period, which prevented standardized estimates of competence for the therapist sample.

The final aim of the study was to explore the cost-effectiveness of providing and receiving mental health treatment from a TC. We did not expect years of experience to predict the cost-effectiveness of treatment from any perspective. Although we expected treatment costs

to be higher for 3rd-year therapists, we did not expect the cost-effectiveness ratios (or cost per 1-point increase on the OQ) to be higher than those of 2nd-year therapists so as to deter potential clients from pursuing treatment from more experienced therapists. Thus, we did not expect 2nd and 3rd-year therapists to differ in their cost-effectiveness. Within our cost-effectiveness analysis, we determined the thresholds at which decisionmakers can consider TC mental health services cost-effective.

CHAPTER 2

METHOD

The analysis of archival data was approved by the Institutional Review Board of the TC's university. Data was used from clients who were seen between September 1, 2008 and September 1, 2019 by either 2nd- or 3rd-year clinical psychology doctoral students enrolled in a cognitive-behavioral therapy (CBT) practicum at a private university in the Washington, D.C. metro area of the United States. Copies of consent forms are presented in Appendices B and C. According to a meta-analysis of treatment outcome studies using hierarchical linear modeling (HLM), our study of 69 therapists and 3 clients per therapist would be sufficiently powered to detect a therapist effect (R^2 as a percentage) around 8.5% (95% CI [4.19, 22.91] (Table 3; Schiefele et al., 2017), meaning 8.5% of the variance in client OQ improvement would be accounted for by between-therapist effects irrelevant to clinical experience.

2.1 Client Sample

The clinic director conducted brief phone screenings with prospective clients to obtain basic demographic information (age and gender), history of previous treatment, and presenting concerns. To be eligible for treatment in the training clinic, clients were required to (a) be 18 years of age or older and (b) not have a psychotic or substance abuse disorder, as determined by the clinic director during the phone screening. In-person intakes were not introduced until September 2016. To have been considered for inclusion in the present study, we followed the criteria set forth by Smout and colleagues (2019) in their review of training clinic outcome evaluations: a) clients must have attended at least 3 therapy sessions, b) outcome data must have been available for at least 2 treatment sessions, and c) if clients had multiple treatment episodes at the clinic, only outcome data from their first treatment episode was included. All clients

consented to use of their deidentified OQ 45.2 (Lambert et al., 1996) for research when they consented to treatment (consent form in Appendix A). Client demographic information by therapist year of experience is presented in Table 1.

Table 1

Client Demographics by Therapist Year of Experience

	2 years N = 93	3 years N = 119	
	Mean (SD)	Mean (SD)	
Age (N = 191)	28.44 (9.87)	28.89 (11.12)	p = .77
Tx episodes (N = 211)	1.18 (0.44)	1.24 (0.52)	p = .42
	%	%	
AU student status (N = 181)			p = .08
Not an AU student	67.7%	56.3%	
AU undergraduate student	14.0%	20.2%	
AU graduate student	3.2%	9.2%	
Gender (N = 205)			p = .66
Female	63.4%	71.4%	
Male	26.9%	27.7%	
Other	2.2%	0.8%	
Diagnosis (N = 203)			p = .14
Depression	34.4%	36.1%	
Anxiety disorder	30.1%	40.3%	
Couple distress	14%	11.8%	
Impulse control disorder	1.1%	5.0%	
Eating Disorder	3.2%	0.0%	
Other	8.6%	5.9%	

Note. Some data were missing for gender (3%), age (10%), American University student status (15%), and diagnosis (4%). Sexual orientation and race/ethnicity breakdowns are not reported because over half of the data (96% and 60%, respectively) were missing.

2.2 Therapist Sample

The TC therapists were students in their second or third year of training in a Clinical Psychology Ph.D. program at the university where the clinic was located. Therapists who had three years of clinical experience started before 2013, and therapists who had two years of clinical experience started in 2013 or later, which could introduce a cohort effect. The former completed a psychodynamic practicum in their second year of training and the CBT practicum during their third year of training. The latter completed the CBT practicum during their second year and either a psychodynamic or advanced CBT practicum during their third year. Only CBT and advanced CBT practicums were housed in the TC. Thus, curriculum differences intersect with experience differences between the two therapist groups. All therapists began clinical training during their first academic year in the program, so a therapist who was in their first year of academic training was also in their first year of clinical training. The practicum sequence is presented in Table A1.

2.3 Costs

In line with Neumann and colleagues' (2017) recommendations for conducting cost-inclusive evaluations in the healthcare sector, we calculated direct and indirect costs of delivering CBT from multiple perspectives. This approach estimates the cost per unit of each service and multiplies it by the amount of services delivered to each client.

2.3.1 University Perspective

It is important to note that the university housing the TC provided extensive resources for the TC: A client waiting area, two therapy rooms, a filing room, faculty offices, and a classroom. Because the university owned and operated these facilities, the university did not incur any expenses to acquire these facilities and, correspondingly, would not save any costs should the TC

cease to operate. The university also paid the salaries and provided fringe benefits for two faculty members, one who directed the clinic and another who provided didactics; these faculty members did not receive additional compensation for their clinic duties during the 9-month school year. In addition, the university provided incoming clinical psychology PhD students with a stipend and tuition remission. Therapist compensation was excluded from university perspective costs because therapists received this compensation for teaching assistant, not clinical, duties. Relatedly, the therapists would receive such compensation regardless of TC operation. The only costs incurred by the university to exclusively operate the TC included the stipend for the clinic director for her summer clinic-related duties, the stipend for the supervisor during the summer months, a video recording system, and a yearly subscription to the OQ 45.2 software. Building maintenance and malpractice insurance costs were excluded because both would have been incurred regardless of TC operations. Specifically, the university's malpractice insurance policy covered students for off-site externships; therefore, the university would pay for this policy as long as students were completing externships in the community, regardless of TC operating status. Detailed university perspective costs are illustrated in Table 2.

2.3.2 Therapist Perspective

We used an opportunity value approach to estimate the value of a therapist's time according to the next-best activity in which they could be engaged (Yates, 1996). To maximize generalizability, Yates (1996) recommended using the United States federal General Schedule (GS) pay scales for mental health providers because they are standardized to a provider's geographic region, education level, and experience. Psychology Series (0180) GS-07 step one (\$29.47) and GS-09 step one (\$36.05) hourly pay rates, including fringe benefits, were used to value the time of 2nd- and 3rd-year therapists, respectively, because such classifications best

matched the education, experience, and clinical responsibilities of these students (U.S. Office of Personnel Management, 2019). The GS and alternative unit cost valuations for therapists are presented in Table A1.

Table 2

University Perspective Costs for Clinic-Related Activities
for a 5-Therapist Cohort

	Cost/yr
Supervisor ^a	\$1,250.00
Clinic director ^b	\$2,197.44
Equipment ^c	\$499.00
Total costs/yr	\$3,946.44

Note. ^aA clinical supervisor was paid \$250/student to provide clinical supervision over the summer. ($\$250 \times 5 = \$1,250$)

^bThe clinic director's summer stipend for clinic-related duties (E. Hart, personal communication, August 1, 2019). ^c\$249 / yr (1 yr Camstasia license for audio/visual recording) + \$250 / yr (1 yr web-based OQ 45.2 license).

2.3.3 Client Perspective

Also using the opportunity value approach, client time was valued as wages, including fringe benefits, lost due to time spent in, as well as traveling to and from therapy. Out-of-pocket costs for therapy were also included. Details about client perspective costing methodology are presented in Appendix D. Client perspective costs are presented in Table D1.

2.3.4 Summed Perspective

The summed perspective was the sum of therapist and client costs.

2.4 Effectiveness

The primary outcome of interest in this study was change in OQ scores over time (OQ; Lambert et al., 1996). The OQ is one of the most commonly-used outcome measures in TCs (Peterson & Fagan, 2017). It provides an overall client-reported general distress score, as well as

symptom distress, interpersonal relationships, and social role subscale scores. The OQ does not provide therapist ratings of client progress. Clients completed the OQ before each therapy session. Test-retest reliability of the total score ranges from .74 to .81 with an internal consistency of .93 for the total score (Lambert et al., 1996). The total score and distress subscale are highly correlated (Taescavage & Ben-Porath, 2014). The total score is sensitive to clinically significant change using the Jacobson and Truax (1991) criteria in TCs and community outpatient settings (Cramer, et al., 2016; Taescavage & Ben-Porath, 2014).

2.5 Data Analysis Plan

We collected therapist and client demographic data, which were limited. We examined differences in client demographics, using available data, between therapists with two and three years of experience using analysis of variance (ANOVA). Due to a high level of missingness, we did not examine moderation by client gender, race, and age. These variables have also not been included in other studies that examine the impact of therapist experience on client outcomes (e.g., Lutz et al, 2007). Statistical analyses were conducted in IBM SPSS Statistics (Version 26) and HLM (Version 8; Raudenbush et al., 2019). Probabilistic sensitivity analyses were conducted using TreeAge Pro Healthcare (TreeAge Software, 2021).

2.5.1 Effectiveness

In line with other literature that has examined between-therapist differences in client outcomes over time, we tested our hypotheses using a slopes-as-outcome three-level nested growth model (Lutz et al., 2007; Tasca et al., 2009). We used hierarchical linear modeling (HLM) because our dependent variables were not independent of one another, which violated the independence assumption of ordinary least squares regression (Kenny & Judd, 1986). Since

clients had multiple sessions, OQ scores at each session (Level 1) were nested within clients (Level 2), which were nested within therapists (Level 3).

We began with a visual inspection of growth plots to determine whether a linear or log-linear function best fit the data (Singer & Willett, 2003). We then calculated intra-class correlations (ICCs) to determine the percentage of variance in OQ scores accounted for by differences between therapists, regardless of experience. If there was significant dependence, scores of clients being treated by a certain therapist would be more similar to one another than to clients being treated by another therapist (Tasca et al., 2009). In a review of therapist-level effects in psychotherapy research, the average effect is $r = .08$, so intra-class correlations that are near zero still warrant an examination of between-therapist effects (Baldwin et al., 2011). Ignoring therapist-level effects when examining rate of client change over time has shown to increase the risk of finding a significant treatment effect when such an effect does not exist, i.e., inflating Type I error rates (Kenny & Judd, 1986; Magnusson et al., 2018). Formulas and descriptions for effectiveness, cost, and cost-effectiveness models appear in Appendix E.

2.5.2 Costs and Cost-Effectiveness

To determine whether treatment provided by therapists with three years of experience was more cost-effective than CBT provided by therapists with two years of experience, we evaluated the relationship between costs and effectiveness. A treatment is considered cost-effective if the cost to produce a unit of change is below a determined willingness-to-pay threshold, or the maximum amount of money a decisionmaker will pay to produce a one-point or 14-point total OQ score reduction, the latter of which reflects reliable improvement (Fenwick et al., 2006; Jacobson & Truax, 1991). A more detailed explanation of willingness-to-pay thresholds is presented in Appendix I.

First, we calculated and compared average per client costs for CBT delivered by therapists with two and three years of experience. Next, we calculated the cost to produce reliable change, which is a decrease of 14 points on the OQ between the first and last session of treatment (Jacobson & Truax, 1991). From all perspectives, we then calculated cost-effectiveness ratios (CERs; total treatment cost / [baseline OQ score – final session OQ score]) for each client and incremental cost-effectiveness ratios (ICER)² between 2nd- and 3rd-year therapists ([Average 2nd-yr therapist cost – Average 3rd-yr therapist cost] / [Average 2nd-yr therapist OQ change – Average 3rd-yr therapist OQ change]; Karlsson & Johannesson, 1996). We used two-level HLM (clients within therapists) to examine, from each perspective, whether number of sessions, therapist experience, and their interaction significantly predicted total per client costs or CERs. We used a two, instead of three, level model because costs increased proportionally over time from all perspectives as the number of sessions increased. Thus, we did not include time as a predictor.

We also calculated cost-effectiveness acceptability curves from each perspective to illustrate the probability that CBT provided by 3rd-year therapists was more cost-effective, or had a higher net benefit, than CBT provided by 2nd-year therapists at different willingness-to-pay thresholds for a 1-point OQ score reduction (Fenwick et al., 2006).

Finally, we provided graphical illustrations: OQ scores over time as a function of costs (Yates, 1996) and OQ score differences (baseline minus termination OQ score) as a function of number of therapy sessions and total treatment costs, each by therapist experience.

² ICERs are traditionally used to compare the cost-effectiveness of two treatments that differ in the type, amount, and unit cost of each resource. In the present study, 2nd- and 3rd-year therapists provided the same treatment, CBT. To calculate ICERs, we attempted to emulate marketplace behavior by assuming therapists with three years of experience were paid more, i.e., had a different unit cost, than therapists with two years of experience.

CHAPTER 3

RESULTS

3.1 Sample Characteristics

Sixty-nine therapists, 26 (37%) 2nd-year and 43 (63%) 3rd-year, saw 250 clients in the CBT practicum between September 2008 to 2019. Of the 2nd- and 3rd-year therapists, 93% and 84%, respectively, were female. Of the 250 clients, 38 did not meet our inclusion criteria: 27 (9%) were seen for fewer than 4 sessions, 9 (3%) did not have data from their first treatment episode, and 2 (1%) were seen by a student with more than three years of experience. Our final sample included 212 clients. Each therapist, on average, treated 3 clients per practicum year (range 1 – 6).

The client sample was mostly females (68%) in their late twenties (M age = 29) who were not AU students (61%) and diagnosed with an anxiety (36%) or mood (35%) disorder. The average annual income for clients, including fringe benefits, was estimated to be \$38,669, the average out-of-pocket session cost was \$17, and the average number of treatment episodes was 1.21. The average baseline OQ score was 70 for the sample, 68 for 2nd year therapists, and 71 for 3rd year therapists, all of which are greater than 63 and, thus, in the clinical range (Lambert et al., 1996). Baseline OQ scores did not significantly differ by therapist experience level, $F(1, 210) = 1.00, p = .32$. The average number of sessions was 14 (range 3-36) for the sample, 13 for 2nd-year therapists, and 15 for 3rd-year therapists. In other words, 2nd year therapists spent at average of 13 hours (1 session = 1 hour) treating each client, and 3rd-year therapists spent an average of 15 hours treating each client. Number of sessions did not significantly differ by year of experience, $F(1, 210) = 1.66, p = .20$.

3.2 Costs

Unsurprisingly, total treatment costs were highest for 3rd-year therapists from therapist and client perspectives. From the therapist perspective, average total costs per client were \$390.08 (SD = \$226.34) for 2nd-year therapists and \$529.32 (SD = \$312.78) for 3rd-year therapists. Client perspective costs were even higher, ranging from \$829.29 (SD = \$831.93) to \$890.59 (SD = \$658.56) for 2nd- and 3rd-year therapists, respectively. This is expected because, unlike therapist costs, the client costs included time spent in, as well as traveling to and from, therapy. Mean and median costs and CERs per client from all perspectives are reported in Appendix Table G1. From the summed perspective, it cost an average of \$1,219.37 (SD = \$1,005.56) for 2nd-year and \$1,419.91 (SD = \$926.75) for 3rd-year therapists to deliver an episode of CBT.

ICCs were .28, .09, and .14 from the therapist, client, and summed perspectives. In other words, 28%, 9%, and 14% of variance in costs from the therapist, client, and summed perspective, respectively, were accounted for by therapist effects. ICCs can be used as an indication of effect size, or strength of the relationship between therapist experience and clinical outcomes (Kirk, 2013). Variance components and fixed effects (Y_{00}) for null models were statistically significant from all perspectives except for variance components from the client perspective ($p = .57$). Thus, there was systematic variation in costs between therapists.

The random slope and intercept models revealed that sessions and experience interacted to predict costs from the therapist perspective only: As therapist experience increased, the relationship between total number of sessions and treatment costs also increased ($b = 6.50$, $SE = .10$, $p < .001$). This is consistent with our earlier finding that clients of 3rd-year therapists, on average, attended more sessions than clients of 2nd-year therapists (15 vs. 13). Costs from the

therapist perspective were also higher for therapists with three, compared to two, years of experience (\$529.32 vs. \$390.08). Results for main and interaction effects are in Table 3.

3.3 Effectiveness

Consistent with extant literature, a scatter plot revealed a log-linear ($\log_{10}$) relationship between sessions and symptom improvement (i.e., a decrease in OQ scores), with the most rapid improvements occurring early in treatment (see Figure 1) (e.g., Lutz et al., 2002). ICCs indicated that .109 (10.9%) of variance in client slopes was accounted for by therapists, .69 (69%) was accounted for by clients, and .23 (23%) was accounted for by time (i.e., sessions). Second, we examined an unconditional model that excluded the Level 3 predictor (therapist experience) to determine whether total sessions and baseline OQ score significantly predicted variance in OQ score changes over time between clients and across therapists. After controlling for total sessions and baseline OQ score, client OQ scores improved over time, $b(68) = 6.50$, $SE = 1.37$, $p < .001$. For every incremental increase in $\log_{10}$ of session number, OQ score differences (baseline OQ score minus OQ score at each subsequent session) increased by 6.5 points, which suggests a reduction in distress over time for the client sample. Additionally, after controlling for total sessions, baseline OQ scores significantly interacted with $\log_{10}$ sessions to predict OQ score changes. For every one-point increase in baseline OQ score, the relationship between $\log_{10}$ sessions and OQ score change (i.e., slope) increased by .29, $b(68) = .29$, $SE = .08$, $p < .001$. In other words, clients in higher distress (i.e., with higher OQ scores) at baseline reduced their distress faster than clients in relatively less distress. Therapist experience did not significantly predict OQ change over time in our conditional model (Table 4).

Consistent with extant literature and our hypotheses, these results suggest that trainee therapist experience did not significantly predict clinical outcomes. A description of variation in average client slopes between therapists is presented in Appendix G.

Table 3

Final Estimation of Fixed Effects for Three Different Cost Models from Multiple Perspectives

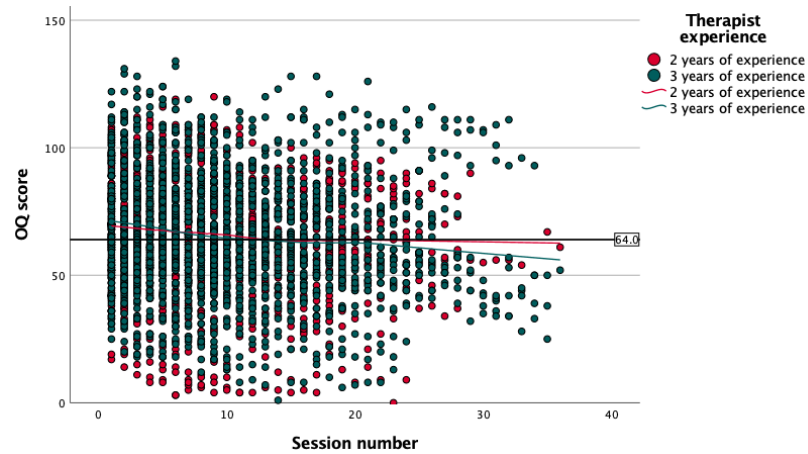
	Main effect of total sessions ^a			Main effect of therapist experience ^b			Total sessions * experience interaction ^c		
	γ_{10}	SE	p-value	γ_{01}	SE	p-value	γ_{11}	SE	p-value
Provider	33.15	.43	< .001	150.24	43.90	< .001	6.50	.10	< .001
Client	64.98	6.57	< .001	71.41	116.08	0.53	4.38	13.48	0.75
Summed	98.77	6.87	< .001	221.29	151.42	0.15	8.04	14.09	0.57

Note. $N = 69$ Level 3 groups. Fixed effects used robust standard errors. ^aAdding total sessions to the null model significantly improved model fit for costs from all perspectives; $df = 68$. ^bAdding therapist experience to the null model did not significantly improve model fit for costs from all perspectives; $df = 68$. ^c $df = 67$. Adding total sessions and therapist experience to the null model significantly improved model fit for costs from all perspectives ($ps < .001$, $df = 4$).

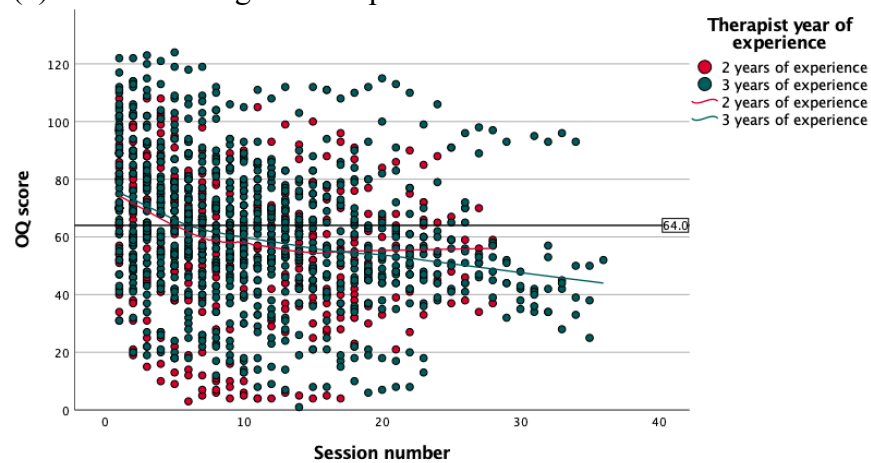
Figure 1

OQ Score as a Function of Sessions and Therapist Experience for the Multiple Samples

(a) Full sample



(b) Reliable change subsample



Note. $N = 212$ for full sample. $N = 85$ for reliable change subsample. Points above the reference line are in the clinical range. A decrease in OQ score indicates improvement, i.e., reduced distress.

Table 4

Estimation of Fixed Effects from Conditional Three Level Model

Fixed Effect	Coefficient	Standard error	t(67)	p-value
Log Sessions (γ_{100})	5.49	2.20	2.50	0.02
Log Sessions * Experience (γ_{101})	1.74	2.79	0.62	0.54
Log Sessions * Total Sessions (γ_{110})	-0.06	0.24	-0.26	0.79
Log Sessions * Total Sessions * Experience (γ_{111})	0.22	0.30	0.71	0.48
Log Sessions * Baseline OQ (γ_{120})	0.22	0.10	2.20	0.03
Log Session * Baseline OQ * Experience (γ_{121})	0.12	0.15	0.82	0.41

Note. $N = 69$ Level 3 groups. Fixed effects used robust standard errors.

3.4 Cost-Effectiveness

3.4.1 Cost per reliable improvement

Average total per client costs for clients who achieved reliable change were \$437.45 (SD = \$227.92) and \$609.63 (SD = \$325.14) from the therapist perspective; \$754.82 (SD = \$579.89) and \$1,015.92 (SD = \$672.34) from the client perspective; and \$1,192.26 (SD = \$746.99) and \$1,625.55 (SD = \$946.98) from the summed perspective for 2nd- and 3rd-year therapists, respectively. Because our primary hypotheses focused on the costs and effectiveness for the entire sample, as opposed to the subsample of patients who achieved reliable change, we did not statistically analyze CERs for the subsample that achieved reliable change.

3.4.1.1 Average cost-effectiveness ratios (CERs). Ten percent of clients ($n = 20$) were missing a baseline OQ score; the series baseline mean (70) was imputed for those missing values and imputed results are reported throughout this text. Results using the non-imputed sample are presented if they led to different conclusions than the imputed sample. Four participants had baseline OQ scores that were equal to their treatment termination scores. Because divisions by

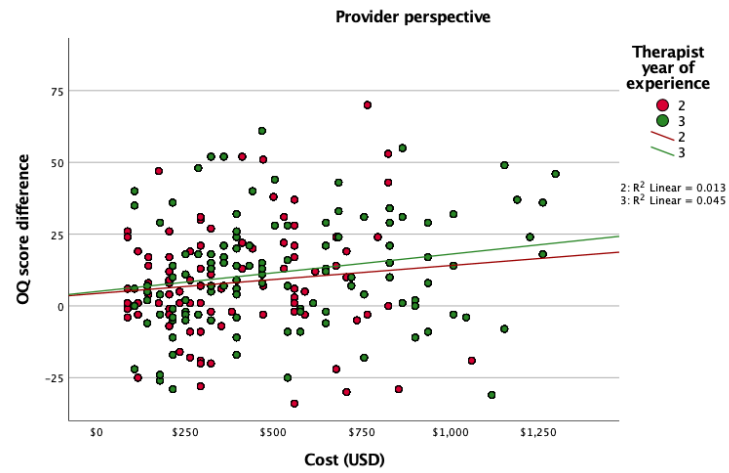
zero generate undefined CERs, only 208 of the 212 participants were included in CER calculations. The number of sessions $F(1, 210) = 0.03, p = .87$, and therapist year of experience, $F(1, 210) = 0.59, p = .45$, did not significantly differ between these four clients and the rest of the sample.

Scatter plots illustrating effectiveness (baseline OQ minus termination OQ score) as a function of costs from each perspective are presented in Figure 2. From the therapist perspective, it cost an average of \$11.09 (SD = \$107.01) and \$11.93 (SD = \$143.47) for 2nd- and 3rd-year therapists, respectively, to produce a one-point change on the OQ by the end of treatment. Unlike average therapist perspective CERs, which were slightly greater for 3rd-year relative to 2nd-year therapists, CERs were lower for 3rd-year therapists from the client and summed perspectives. CERs were as follows for 2nd- and 3rd- year therapists from the client and summed perspectives, respectively: \$38.57 (SD = \$284.86) and \$18.57 (SD = \$258.67); \$49.66 (SD = \$383.01) and \$30.50 (SD = \$399.27). CERs from all perspectives are reported in Table G1. For clients who achieved reliable change, average CERs led to different conclusions: From all perspectives, average CERs were lower for 2nd-year therapists than for 3rd -year therapists. For clients who achieved reliable change, this could mean that 2nd-year therapists had superior pre-post effectiveness, shorter treatment lengths, or both, compared to 3rd-year therapists.

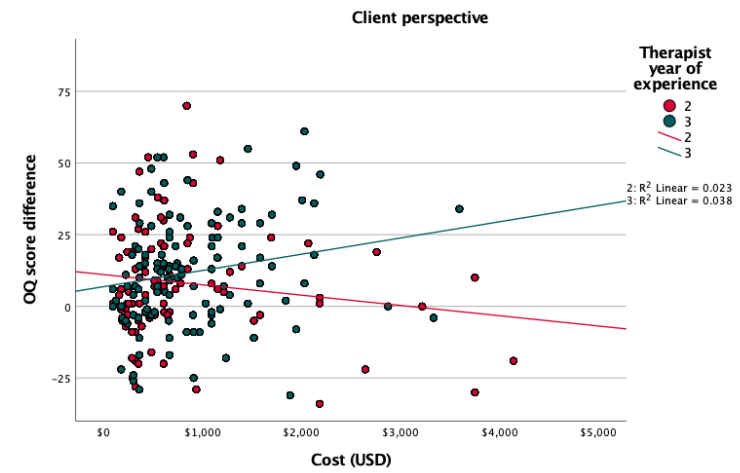
Figure 2

Effectiveness as a Linear Function of Costs and Therapist Experience from Multiple Perspectives

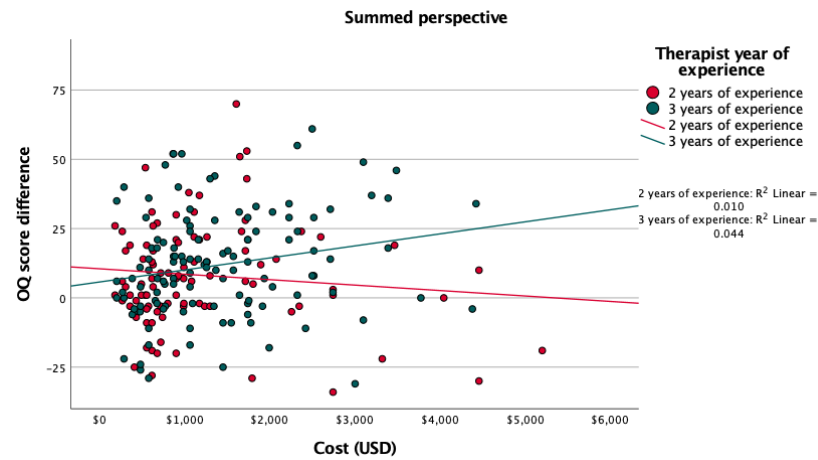
(a)



(b)



(c)



CERs were as follows for 2nd- and 3rd-year therapists from the therapist, client, and summed perspectives, respectively: \$16.86 (SD = \$10.62) and \$24.19 (SD = \$15.15); \$31.38 (SD = \$31.53) and \$39.21 (SD = \$26.42); \$48.25 (SD = \$40.61) and \$63.39 (SD = \$58.14). Reliable change clients who saw therapists with two years of experience did have fewer sessions than more experienced clinicians (14.84 vs 16.94 sessions), but not significantly so, $F(1,83) = 1.23$, $p = .27$. Additionally, the average pre-post OQ score difference was equal for both levels of experience (28.94 OQ points). Thus, 2nd-year therapists had lower CERs because they were more efficient: They produced the same OQ score difference in fewer sessions for clients who reliably improved, but not significantly so.

3.4.1.2 Incremental cost-effectiveness ratios (ICERs). Compared to a 2nd year therapist, it cost \$37.03, \$16.30, and \$53.34 more for a 3rd year therapist to produce an additional one-point reduction on the OQ from the therapist, client, and summed perspectives, respectively. These findings suggest that CBT delivered by 3rd-year therapists was both more costly and more effective than CBT delivered by 2nd-year therapists.

For the 85 clients who achieved reliable change by treatment termination, ICERs were undefined because the average difference in OQ score between baseline and termination was 28.94 for clients of both 2nd- and 3rd-year therapists. ICERs were negative from all perspectives for the non-imputed sample that achieved reliable change (i.e., clients missing a baseline OQ score were excluded; $N = 76$; ICERs: -\$374.10, -\$565.06, and -\$939.13 from the therapist, client, and summed perspectives, respectively. These ICERs suggest that CBT delivered by 2nd year therapists was less costly and similarly effective compared to CBT delivered by 3rd year therapists for clients whose OQ scores differed by at least 14 points between baseline and treatment termination. Because the difference in effectiveness between 2nd- and 3rd-year

therapists for this subsample was less than 1 point (29.13 vs. 28.61), the ICER units from all perspectives were inflated and should be interpreted with caution. ICERs from all perspectives and for different samples are reported in Table G2.

3.4.1.3 Hierarchical linear modeling with cost-effectiveness ratios. Our null model produced ICCs of .043, .011, and .030 for CERs from the therapist, client, and summed perspective. In other words, the null model predicted that 4.3% (therapist), 1.1% (client), and 3.0% (summed) of variance in CERs was accounted for by between-therapist differences, thus warranting nested models for CER examination from each perspective. Random-intercept models revealed that total sessions, $ps = .18 - .46$, and baseline OQ scores, $ps = .86 - 1.00$, did not significantly predict CERs from any perspective. The means-as-outcome model further revealed that therapist experience (excluding Level 1 predictors) did not significantly predict CERs from any perspective, $bs(67) = -19.29 - 1.11$, $SEs = 18.10 - 55.48$, $ps = .62 - .95$. Therapist experience, alone, did not predict costs from any perspective, $ps > .51$. Additionally, therapist experience did not interact with baseline OQ scores, $ps > .51$, or total number of sessions, $ps > .51$, to predict variation in CERs, regardless of the cost perspective adopted. Coefficients for the full cost-effectiveness models from all perspectives are in Table 5.

3.5 Sensitivity Analysis

Therapy delivered by 3rd-year therapists is more cost-effective than therapy delivered by 2nd-year therapists approximately 55% of the time at WTP thresholds of \$37, \$35, and \$60 from the therapist, client, and summed perspectives, respectively. CEACs are presented in Figure 3 and incremental cost-effectiveness scatterplots are presented in Appendix H.

Table 5

Estimation of Fixed Effects for the Full Model Predicting Cost-Effectiveness Ratios from Multiple Perspectives

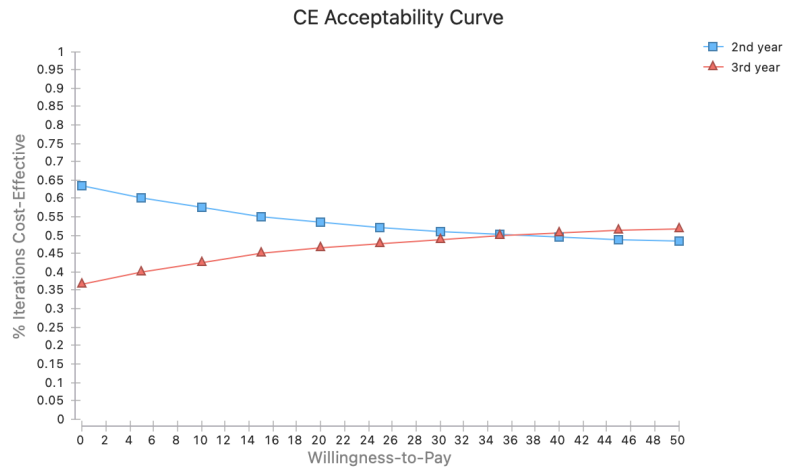
	Experience, γ_{01}	SE	t(67)	Experience* BL OQ, γ_{11}	SE	t(67)	Experience* Sessions, γ_{21}^a	SE	t(67)
Provider	0.04	17.15	0.58	0.11	0.57	0.13	2.28	3.41	0.58
Client	-17.44	34.23	-0.51	0.66	1.25	0.53	-0.95	6.89	-0.14
Summed	-17.14	50.70	-0.34	0.78	1.79	0.44	1.33	10.04	0.13

Note. $N = 69$ Level 3 groups. Fixed effects used robust standard errors.; all $ps > .51$. ^aAdding total sessions and therapist experience to the null model significantly improved model fit for CERs from all perspectives ($ps < .001$, $df = 5$).

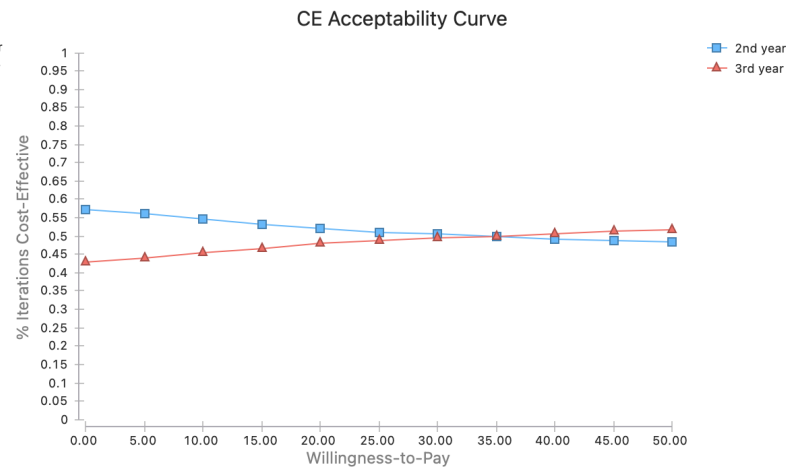
Figure 3

Cost-Effectiveness Acceptability Curves from Multiple Perspectives

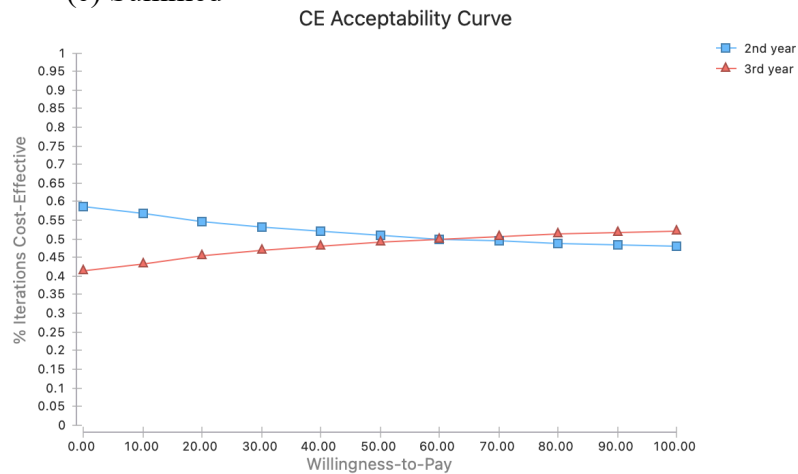
(a) Provider



(b) Client



(c) Summed



Note. CEACs were generated using 10,000 re-samples and illustrate the probability that one treatment has higher net monetary benefits (NMB) than its comparator. $NMB = Effectiveness * WTP - Cost$. When $WTP = 0$, the lower cost strategy will always be the most cost-effective because the outcome metric also lacks value (using the NMB formula, $Effectiveness * 0 = 0$); as the WTP threshold increases, the probability that the more effective treatment will be the most cost-effective treatment increases.

CHAPTER 4

DISCUSSION

The present study utilized a naturalistic dataset within a private university TC to examine (1) the amount and monetary value of administrative resources needed to deliver CBT within a TC, (2) whether therapist experience influenced the rate of clinical improvement, and (3) the cost-effectiveness of CBT delivered by trainee therapists with two or three years of experience from multiple cost perspectives. Our first hypothesis was confirmed and replicated extant literature: There were significant differences in rates of clinical improvement between therapists, but therapist experience did not predict treatment outcomes. Our second hypothesis was also supported: On average, client distress decreased over time for the full sample. Our third hypothesis was that therapy delivered by therapists with three years of experience would be more cost-effective than therapy delivered by therapists with two years of experience because they would treat clients faster and, thus, have lower average per-client treatment costs. Contrary to this hypothesis, the average number of sessions per client did not significantly differ between therapists with two and three years of experience. Therapists with three years of experience were more costly from all perspectives than therapists with two years of experience. In addition, distress reductions and CERs did not significantly differ between therapists with different experience levels. A probabilistic sensitivity analysis confirmed conclusions that therapists with two years of experience may be more cost-effective than therapists with three years of experience

4.1 Costs

Our university perspective cost estimates suggested that TCs greatly benefit from existing university facility and personnel resources. Moreover, TCs are unique because the sustainability

of their operation is not dependent upon client revenue. Because TCs rely on university resources that are agnostic to client volume, their low-fee business model is sustainable. A solo practitioner, for example, may be unable to charge clients less than \$100 per session to cover overhead expenses related to the operations of their solo practice and have enough take-home pay to support their lifestyle. In addition, our cost estimations relied on many assumptions that, if varied, could lead to lower or higher annual costs. For example, a TC in a city with a lower cost of living would have lower unit costs for providers and facilities. Finally, although there is no official estimate of the average cost of therapy in the United States, some data suggest that one session of therapy costs between \$60 and \$120 (Thervo, 2020). It is reasonable to assume that clients who sought treatment at the Gray Clinic would be unable to afford paying more than \$40 per session and, thus, would not have received treatment but for the Gray Clinic's \$10 - \$40 sliding fee scale. Therefore, the public health benefit of low-cost CBT delivered in training clinics cannot be overstated.

Average per client treatment costs were highest for 3rd-year therapists from all perspectives. Of note, client perspective costs were 113% greater than therapist costs for clients of 2nd year therapists and were 68% greater than therapist costs for clients of 3rd year therapists. These findings highlight how clients invest up to double the resources to receive treatment that therapists invest to provide treatment. We hope that these findings highlight the importance of estimating client perspective costs in future economic evaluations of all treatment (mental and physical) designed to improve well-being. Unsurprisingly, as treatment length increased, treatment costs also significantly increased from all perspectives. Finding ways to reduce the length of treatment can help reduce total treatment costs for therapists and clients. Treatment length and therapist experience also interacted to predict therapist costs, likely because therapists

with three years of experience had a higher per-session cost than clients of therapists with two years of experience, and because clients of 3rd-year therapists, on average, spent more time in treatment than clients of 2nd-year therapists.

Other delivery formats, such as group, single session, and virtual psychotherapy have the potential to reduce costs from both the provider and client perspective. For example, group therapy could reduce a provider's per-client treatment cost because they could treat more than one client per hour; and virtual therapy could reduce a provider's office space costs and a client's transportation costs. With lower operating costs, providers could lower session fees without sacrificing their profit margin; without having to travel to and from an office, clients may be more likely to initiate treatment. We encourage researchers of alternative psychotherapy delivery systems to include cost estimates of their interventions so that the cost-effectiveness of different CBT delivery systems can be compared.

4.2 Effectiveness

Over time, the entire sample reported reduced distress on the OQ. As expected, therapists differed in their effectiveness, but experience did not significantly impact the rate of treatment improvement. The amount of variance accounted for by between-therapist differences in our study (10.6%) was comparable to therapist variance from existing research in naturalistic datasets (8.26%; Lutz et al., 2007) and reinforces the importance of using nested models to account for within-therapist dependence in treatment outcome studies. We also found that, as baseline OQ score increased, the rate of clinical improvement also increased. Literature evaluating the relationship between baseline symptom severity and clinical improvement suggests that this phenomenon may be more common in studies with clinically heterogeneous samples: Baseline symptom severity predicted more rapid clinical improvements in a general

sample of mental health clients in a primary care clinic (Bryan et al., 2012), but predicted worse outcomes among socially anxious clients (Hoyer et al., 2016).

4.3 Cost-Effectiveness

The average cost to help a client reliably improve, or reduce their OQ score by 14 points, was similar to the average cost for the full sample and emulated the pattern of results for full sample treatment costs: Treatment costs were higher for clients of therapists with three, versus two, years of experience from all perspectives.

CERs were also calculated for each patient to reflect the cost to produce a one-point reduction on the OQ between the start and end of treatment. Decisionmakers with limited resources usually prefer to invest the fewest resources to produce an outcome. Thus, a treatment with the lower CER may be preferable and considered more cost-effective. Using this interpretation, cost-effectiveness differed by cost perspective and sample. For the full sample, therapists with two years of experience were slightly more cost-effective than therapists with three years of experience from the therapist perspective (\$11.09 for 2nd-year vs. \$11.93 for 3rd-year); but the reverse was true (therapists with three years of experience were more cost-effective) from the client (\$38.57 for 2nd-year vs. \$18.57 for 3rd-year) and summed perspectives (\$49.66 for 2nd-year vs. \$30.50 for 3rd-year). For the reliable change subsample, CERs from all perspectives suggested that 2nd-year therapists were more cost-effective.

A treatment with the lowest CER, however, may not be considered the cost-effective alternative if a decisionmaker is willing to pay more than what they are currently paying to produce an additional unit of effectiveness, beneath a certain threshold. Unlike CERs, ICERs reveal group differences in costs and effectiveness, thus illustrating the incremental cost needed to produce an incremental unit of effectiveness and providing decisionmakers with additional

information about the cost and effectiveness trade-off. ICERs suggested that therapy delivered by therapists with three years of experience was both more costly and effective than therapy delivered by therapists with two years of experience from all perspectives. Although some decisionmakers may be willing to pay between \$16.30 and \$53.34 (depending on the perspective) additional dollars for a 3rd-year therapist to produce an additional reduction of one point on the OQ, others may not. However, confidence in the decision to invest additional money in therapists with three, versus two, years of experience may weaken when considering that therapists with two years of experience were equally effective at producing reliable change than therapists with three years of experience, and for a lower cost.

4.3.1 Sensitivity analysis

Conclusions about the cost-effectiveness of one treatment relative to another are subjective because they are determined by (a) the cost and effectiveness of the comparator treatment and (b) the amount of money a decisionmaker is willing to pay to produce an additional outcome unit. In addition, uncertainty in the cost and effectiveness estimates of all treatments being considered can reduce confidence in conclusions generated by the ICER. Cost-effectiveness acceptability curves illustrate this uncertainty to help decisionmakers maximize confidence in their determination of whether an additional unit of effectiveness is worth an additional cost. Our sensitivity analysis for ICERs from each perspective highlighted that 3rd-year therapists are more costly and more effective than 2nd-year therapists at chance levels (50%-55%) at willingness-to-pay thresholds between \$35 and \$60 (depending on the perspective). Importantly, neither CERs nor ICERs look at rates of change over time, which provide unique information beyond pre-post differences about treatment effectiveness and, consequently, cost-effectiveness. For example, a client who improves faster than another may need fewer

psychotherapy sessions, even if their pre-post difference scores are the same, which would reduce treatment costs.

4.4 Limitations

Our primary variable of interest was therapist experience: 2 years vs. 3 years of experience. A broader experience range (e.g., 2 – 10 years) could have increased variability in the relationship between experience and treatment outcome and, correspondingly, our ability to detect an effect of experience. Additionally, therapists in their 3rd and 2nd year of training were each in their first year of CBT training, which could have further reduced the likelihood of finding a significant relationship between experience and outcome. Also, in line with extant literature, therapeutic alliance and CBT protocol adherence may have provided a more valid proxy of therapist effectiveness than experience (Kazdin, 2005; see also, DeRubeis, Brotman, & Gibbons, 2005).

Our study may have been sufficiently powered to detect the therapist-level variance we computed (10.6%) if each therapist saw three clients. However, about 30% of therapists saw fewer than three clients, thus reducing confidence in our conclusions about between-therapist differences in effectiveness. Additionally, these variance estimates were based on .8 power (Schiefle et al., 2017). Using a higher a priori power level (e.g., $\geq .95$) could have generated a more reliable estimate of the sample size needed to appropriately reject a null hypothesis if it was false. In other words, we likely would have needed an even larger sample to increase confidence in our hypothesis that therapist experience would not have a significant effect on treatment effectiveness.

We believe that evaluating the impact of therapist experience on clinical outcomes in naturalistic mental health settings confers unique advantages relative to experimental designs.

Allowing therapists to differ in the duration of their treatment episodes, for example, enabled us to determine that treatment length, as measured by number of sessions, significantly moderated per-client treatment costs from the therapist perspective. However, standardizing treatment length may have reduced the potential impact of other factors, such as supervisor influence, on treatment length. Although research conducted in naturalistic settings can improve a study's external validity by reflecting the heterogeneity of real-world therapists and clients, such heterogeneity may compromise internal validity. Relatedly, clients were not randomized to 2nd- or 3rd-year therapists, which can limit generalizability. It is important to note that TC clinicians received rigorous training and supervision during the study period. In addition, the average number of sessions in the present study (14) falls within the range of a typical CBT treatment duration for moderate depression (8 – 16; Gautam, Tripathi, Deshmukh, & Gaur, 2020). Arguably, treatment fidelity for CBT delivered in TCs may be more like fidelity for CBT delivered in clinical trials than in general outpatient settings, where licensed therapists have different theoretical orientations and are not required to be supervised. We also did not randomize clients to a wait-list control group. Thus, we cannot reject possible alternative explanations for treatment improvement, such as the simple passage of time.

We also lacked detailed information about client income and transportation costs. Thus, client costs had to be estimated, which reduced between-client variability and increased uncertainty in their generalizability. Since our average client cost estimates suggested that clients spend up to twice as many resources receiving treatment as therapists do delivering treatment, we highly recommend that therapists in clinical research settings inquire about and report the number of miles traveled, mode of transportation used (including out-of-pocket costs for public

transportation), and time spent in transit to and from therapy to better understand how client costs may impact a client's ability to access and benefit from treatment.

As explained earlier, conclusions about a treatment's cost-effectiveness are subjective. Cost-benefit analyses can provide more quantitative information about whether investments in mental health treatment are worth it by examining whether the costs of treatment are off-set by cost-savings related to treatment (i.e., cost-savings > treatment costs). Unfortunately, we were unable to conduct a cost-benefit evaluation because the TC did not collect data about common sources of cost-savings, such as changes in medication use or mental health hospitalizations. Additional research is needed on the cost-savings related to CBT delivered within and outside of TCs to complement findings about the cost-effectiveness of CBT delivered by clinicians with different experience levels.

4.5 Future Directions

We encourage psychotherapy researchers to continue evaluating the role of therapist and client-level moderators of treatment effectiveness in TCs. Attention to specific (e.g., adherence to a specific treatment protocol) and nonspecific (e.g., therapeutic alliance) factors, as well as mechanisms of change, is particularly warranted (Kazdin, 2005). Finally, we encourage researchers to report of the types and amounts of resources needed to deliver evidence-based psychotherapy from both the provider and client perspective to enable cost-effectiveness estim

APPENDIX A

PRACTICUM SEQUELAE AND PERSONNEL COSTS

Table A1

Practicum Sequelae by Academic Year for Cohorts Starting Between 2008 and 2018

	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
2012 cohort ^a	Experiential	Psychodynamic	CBT				
2013 cohort		Experiential	CBT				
2014 cohort			Experiential	CBT			
2015 cohort				Experiential	CBT		
2016 cohort					Experiential	CBT	
2017 cohort						Experiential	CBT

Notes. ^aCohorts that started between 2008 and 2011 had the same practicum sequelae as the cohort that started in 2012.

Table A2

Mean University Perspective Personnel Costs per Year per Hour for Clinician Training and Clinic Management Using Operations Value Approach

Resource	Formula	Unit cost/hr
GS – 07 ^a + fringe benefits	$\$22.53 / \text{hr} + (\$22.53 * .31)$	\$29.47
GS – 09 + fringe benefits	$\$27.56 / \text{hr} + (\$27.56 * .31)$	\$36.05
Operations value ^b estimates of clinician & teaching assistant unit cost/hr		
Stipend w/o tuition remission, health insurance, working 20 hrs/wk	$\$22,000^c / (32 \text{ wks} * 20 \text{ hrs/wk})$	\$34.38
Stipend w/o tuition remission, health insurance, working 40 hrs/wk	$\$22,000 / (32 \text{ wks} * 40 \text{ hrs/wk})$	\$17.19
Stipend + tuition remission, health insurance, working 20 hrs/wk	$\$51,762^d / (32 \text{ wks} * 20 \text{ hrs/wk})$	\$80.88
Stipend + tuition remission, health insurance, working 40 hrs/wk	$\$51,762 / (32 \text{ wks} * 40 \text{ hrs/wk})$	\$40.46

Note.^aGS Psychology Series (0180) pay scale for the Washington D.C. metro area. Fringe benefits were estimated as an additional 30.8% of wages based on the average total fringe benefits for civilian health care and social assistant workers (National Compensation Survey, 2018). ^bAn operations value approach uses salaries of employees conducting the work being microcosted (Yates, 1996). ^c32-week stipend reported by students attending the graduate program housing the TC. ^dStipend (\$22,000) + tuition (\$27,872) + health insurance (\$1,890).

APPENDIX B

GRAY CLINIC CLIENT CONSENT FORM



AMERICAN UNIVERSITY
WASHINGTON, DC

DEPARTMENT OF PSYCHOLOGY

James J. Gray Psychotherapy Training Clinic Consent Form/Policies and Procedures

Welcome to the James J. Gray Psychotherapy Training Clinic! This document contains important information about the clinic's professional services and business policies. It also contains summary information about the Health Insurance Portability and Accountability Act (HIPAA), a federal law that provides privacy protections and patient rights about the use and disclosure of your Protected Health Information (PHI) for the purposes of treatment, payment, and health care operations. Although these documents are long and sometimes complex, it is very important that you understand them. When you sign this document, it will also represent an agreement between us. We can discuss any questions you have when you sign or at any time in the future.

PSYCHOLOGICAL SERVICES

Therapy is a relationship between people that works in part because of clearly defined rights and responsibilities held by each person. As a client in psychotherapy, you have certain rights and responsibilities that are important for you to understand. There are also legal limitations to those rights that you should be aware of. As therapists, we have corresponding responsibilities to you. These rights and responsibilities are described in the following sections.

Psychotherapy has both benefits and risks. Risks may include experiencing uncomfortable feelings, such as sadness, guilt, anxiety, anger, frustration, loneliness and helplessness, because the process of psychotherapy often requires discussing the unpleasant aspects of your life. However, psychotherapy has been shown to have benefits for individuals who undertake it. Therapy often leads to a significant reduction in feelings of distress, increased satisfaction in interpersonal relationships, greater personal awareness and insight, increased skills for managing stress and resolutions to specific problems. But, there are no guarantees about what will happen. Psychotherapy requires a very active effort on your part. In order to be most successful, you will have to work on things we discuss outside of sessions.

CONFIDENTIALITY

The James J. Gray Psychotherapy Training Clinic (JJGPTC) is a student training clinic. Thus, you will be assigned a student-therapist in their 2nd year of American University's Clinical Psychology Doctoral Program. All student-therapists are supervised by a licensed clinical psychologist. Your case and/or content of your case may be used for instructional purposes. However, it is important for you to understand that all information shared within the training clinic is confidential and no information will be released to outside agencies without your consent. During the course of treatment at JJGPTC, it may be necessary for your therapist to communicate with supervisors and other student-therapists. While written authorization will not be requested, prior to any discussion with JJGPTC training members, your therapist will discuss communications with you. In all other circumstances, consent to release information is given

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through written authorization. Verbal consent for limited release of information may be necessary in special circumstances.

Protecting the confidentiality of your communications (written, oral, or taped) is your therapist's ethical and legal responsibility. NO information (including the fact that you are seen in treatment) can be released without your consent. There are specific and limited exceptions to this confidentiality which include the following:

- A. When there is risk of imminent danger to yourself or to another person, the clinician is ethically bound to take necessary steps to prevent such danger.
- B. When there is suspicion that a child or elder is being sexually or physically abused or is at risk of such abuse, the clinician is legally required to take steps to protect the individual, and to inform the proper authorities.
- C. When a valid court order is issued for medical records, the clinician and the agency are bound by law to comply with such requests.

TRAINING ISSUES

In addition to the above legal exceptions, your therapist is a trainee in a clinical psychology Ph.D. program and as such will be receiving individual and group supervision of the treatment. This has the following implications:

- A. As a part of our training mission, sessions will be video or audio recorded for supervision. If you cannot agree to this provision, we will provide a list of additional therapy options in the community. Understand that such recording(s) will be used only for educational purposes and that the professionals involved will respect and protect the confidential nature of the sessions.
- B. Your therapist will write chart notes concerning therapy sessions, which will be maintained in a secure fashion in the clinic.
- C. Your treatment will be discussed in supervision meetings between therapist and supervisor. The supervisor for the ~~2016~~2018-2017-2019 Academic Year is David Haaga, PhD..

RESEARCH ISSUES

In addition to providing a community service, the clinic is intended to support research on psychotherapy, in the hope that therapy methods might thereby be improved, for the benefit of future clients. This has the following implications:

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- A. Your therapist may elect to write a summary of methods used, and results obtained, in your therapy. This report could conceivably be distributed to other professions (e.g., publications in a professional journal or book). If such a report is written, no identifying information about you would be included.
- B. You will be asked to complete, prior to treatment, an intake evaluation consisting of an interview and a number of standard questionnaires regarding your psychological well-being. Some of these measures will be repeated periodically throughout the course of your treatment as one way of monitoring the effectiveness of treatment.
- C. Besides being used for training purposes, tapes of your sessions might be viewed or listened to by researchers (as approved by the Clinic Director) in the context of future studies of psychotherapy. In this case, researchers will not have access to individually identifying information about you.

BETWEEN SESSION COMMUNICATION & APPOINTMENTS

Your therapist will indicate at your first session how you can get a message to her or him between sessions. Please give at least 24 hours' notice if you must cancel or reschedule an appointment.

Your therapist is not available on a 24-hour emergency basis but will provide you with information on hotlines you could use in an emergency situation.

Appointments will ordinarily be 50-60 minutes in duration, once per week at a time you and your therapist agree upon, although some sessions may be more or less frequent as needed. The time scheduled for your appointment is assigned to you and you alone. In addition, you are responsible for coming to your session on time; if you are late, your appointment will still need to end on time.

PROFESSIONAL FEES

The fee is set on a sliding scale. You will be told your fee by the Clinic Director upon initial telephone contact with the clinic. Payment in full is expected at the start of each session for which a receipt will be provided, if requested. You may pay in cash or by check made payable to "American University." You will need to arrange for your own insurance reimbursement, if applicable (with your therapist's input as needed). After two instances of missed or incomplete payments, no additional sessions will be scheduled until the balance is paid in full.

PROFESSIONAL RECORDS

Each therapist is required to keep appropriate records of the psychological services provided. Your records are maintained in a secure location. Records may include notes that you were here, your reasons for seeking therapy, the goals and progress we set for treatment, your diagnosis, topics we discussed, your medical, social, and treatment history, records received from other

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providers, copies of records sent to others, and your billing records. Except in unusual circumstances that involve danger to yourself, you have the right to a copy of your file. Because these are professional records, they may be misinterpreted by and / or upsetting to untrained readers. For this reason, they must be initially reviewed with your therapist, or be forwarded to another mental health professional to discuss the contents. If the Clinic Director refuses your request for access to your records, you have the right to have the decision reviewed by another mental health professional, which the Clinic Director will discuss with you upon your request. You also have the right to request that a copy of your file be made available to any other health care provider at your written request.

OTHER RIGHTS

If you are unhappy with what is happening in therapy, please talk with your therapist so that he or she can respond to your concerns. Such comments will be taken seriously and handled with care and respect. You have the right to considerate, safe and respectful care, without discrimination as to race, ethnicity, color, gender, sexual orientation, age, religion, national origin, or source of payment. You have the right to ask questions about any aspects of therapy and about my specific training and experience.

CONSENT TO PSYCHOTHERAPY

Your signature below indicates that you have read, understood, and agree to these conditions.

Signature of Patient or Personal Representative

Printed Name of Patient or Personal Representative

Date _____

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APPENDIX C

AMERICAN UNIVERSITY ALUMNI CONSENT FORM

PURPOSE

This study is collecting information about characteristics of therapists who have provided treatment in the James. J. Gray psychotherapy training clinic between 2008 and 2020. It is also examining the costs, effectiveness, and cost-effectiveness of psychotherapy provided in the James J. Gray Psychotherapy Training Clinic.

ELIGIBILITY

The only eligibility requirement is that you are enrolled as a student in the American University Clinical Psychology PhD program between 2008 and 2019.

PROCEDURES & COMPENSATION

Your participation will not require a time commitment on your part and you will not be monetarily compensated for your participation. Your decision to participate in the study will simply provide us with access to the scores on all of your yearly externship evaluations that were submitted to American University between 2008 and 2020.

RISKS & BENEFITS

We do not anticipate that you will experience any risks or direct benefits as a result of your participation in the study. We hope that data gathered from this study will help us understand whether therapist's clinical competence impact client treatment outcomes.

VOLUNTARINESS

Your decision to participate in this study is completely voluntary and you may terminate your participation at any time without penalty. Your decision to participate or terminate your participation in this study will not affect your current and future relations with the James J. Gray Psychotherapy Training Clinic or American University.

CONFIDENTIALITY

Externship evaluations are part of your graduate school record, which can be accessed by administrative assistants, your graduate advisor, and the Director of Clinical Training without your permission. These evaluations are also shared with the Clinical Psychology faculty during yearly student progress evaluation meetings. Your consent to participate in this study will allow Dr. Brian T. Yates, a psychology professor at American University, to enter this data into a de-identified database for the primary investigator (PI). To ensure that your data is anonymous to the PI, Dr. Yates will maintain a master list that matches your name to a randomly-generated ID number. This master list will be password-protected and will be stored on a password-protected laptop in a locked room at American University. Dr. Yates has completed American University's IRB-mandated human subjects training and, in accordance with American Psychological Association Ethical guidelines and IRB guidelines, has pledged to keep this data confidential. The aggregate data, which will not contain any information that could identify you, may be disseminated through conference presentations, peer-reviewed journal articles, and the clinic

website. De-identified data may also be used for future research upon approval by American University's Institutional Review Board (IRB).

The primary investigator of the study is Corinne Kacmarek, a 4th-year Clinical Psychology Ph.D. Student in the Program Evaluation Lab (PERL) at American University who is supervised by Dr. Yates. Dr. Yates will not share the identities of students participating in the study with the PI and will not give the PI access to the master list. The primary investigator will only receive access to the database containing de-identified practicum evaluations. Therefore, your information will be anonymous to the PI.

If you have questions or concerns about the study, please contact PERL's director, Dr. Yates. If you are unable to reach Dr. Yates, have general questions or concerns about research at American University, or wish to otherwise speak to someone other than the research staff about this study, please contact the IRB Coordinator, Matt Zembrzuski, at 202-885-3447 or at irb@american.edu.

_____ I consent to the use of my externship evaluations for the study

_____ I decline to participate in the study

Please return this completed form to Lefteris Hazapis by DEADLINE.

(Print) Name

Signature

Date: _____

APPENDIX D

CLIENT PERSPECTIVE COSTS

Because neither exact incomes nor sources of incomes (e.g., employment, family, public assistance) were documented by the clinic, we estimated client annual salary using the mean of the sliding-scale income ranges that clients reported during the intake: Fringe benefits were estimated as an additional 30.6% of total earnings, based on the December 2018 average for all private industry employees in the Northeast region (national average = 31.4%) (National Compensation Survey, 2018). \$10/session, \$0 - \$25,000 (M = \$12,500); \$20/session, \$25,001 - \$50,000 (M = \$37,500); \$30/session, \$50,001 - \$75,000 (M = \$62,500), \$40/session, > \$75,000 (\$87,500). One participant's session fee was \$15; we estimated that their yearly income, including fringe benefits, to be \$32,650. It was not routine for therapists to inquire about income changes during the course of therapy. Since any changes in income that could have occurred during treatment were not documented by the clinic director or therapist, we assumed that all incomes remained the same across the duration of treatment for each client.

We used mean imputation to estimate the session fees and income for the 51% of clients who did not have such data in their chart. Thus, 51% of the clients were assigned a session fee of \$16.87, which is equivalent to a yearly income (including fringe benefits) of \$38,815. This calculation assumes that session fees are approximately .06% of yearly income without fringe benefits, which reflects the average fee/income ratios described earlier).

Transportation

We assumed that all clients spent 60 minutes total traveling to and from the clinic from urban and suburban areas. In other words, we reasoned that a client would not invest more time and resources traveling to therapy than they would in therapy. It would have cost \$4.00 round-

trip to take a bus in 2018; mileage for a private vehicle would have cost \$9.57 (\$0.58/mile; U.S. Office of Personnel Management, 2018) if a client traveled the full length of D.C. both to and from therapy (16.5 miles, based on an area of 68 mi²). We estimated average round-trips costs to be \$6.78, the average of \$4.00 and \$9.57.

Table D1

Client Perspective Costs by Therapist Year of Experience

	2nd year			3rd year			Total		
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation
Treatment time opportunity cost	\$255.17	\$148.62	\$290.31	\$272.00	\$204.58	\$219.29	\$264.62	\$185.98	\$253.03
Out-of-pocket session fee	\$16.88	\$16.87	\$8.49	\$16.78	\$16.87	\$6.18	\$16.83	\$16.87	\$7.28
Transportation time opportunity cost	\$255.17	\$148.62	\$290.31	\$272.00	\$204.58	\$219.29	\$264.62	\$185.98	\$253.03
Out-of-pocket transportation fee	\$89.74	\$74.58	\$51.80	\$99.71	\$88.14	\$58.56	\$95.34	\$74.58	\$55.91
Total client costs	\$829.29	\$547.62	\$827.57	\$890.59	\$669.32	\$655.87	\$863.70	\$616.06	\$736.72

Note. $N = 212$

APPENDIX E

HIERARCHICAL LINEAR MODELS

Three Level Growth Model: Effectiveness

Level 1: Sessions within clients. Level 1 will estimate the OQ score (OQ) for session s for client c treated by therapist t . In this model, the $\log_{10}$ of sessions are treated as a random variable because the number of treatment sessions was not pre-determined, as it would be in a randomized clinical trial. The slope (β_{1ct}) is that client's expected change in OQ score across subsequent $\log_{10}$ sessions and error (e_{sct}) is the deviation of a client's actual baseline OQ score from the expected score. The intercept (β_{0ct}) was removed from the model because the outcome reflects each client's baseline OQ score minus their OQ score at each subsequent session (W. Lutz, personal communication, 6/2021). This anchoring procedure is in line with recommendations from Lutz et al., 2007 and enhances slope reliability by removing the need for a random intercept and allocating all change variance to the random slope component. Put another way: Anchoring highlights the differences between client treatment trajectories that are accounted for by therapist effects, which forces the model to predict each client's OQ change trajectory from their actual, as opposed to predicted, baseline score (Lutz et al., 2007).

$$\text{Outcome}_{sct} = \beta_{1ct}(\text{Log10}[\text{Session}])_{sct} + e_{sct}$$

Level 2: Clients within therapists. Level 2 will estimate the variation in symptom (i.e., OQ score) change between clients seeing the same therapist. Each client's slope, (β_{1ct}), is computed using the mean intercept for all clients seeing therapist t (π_{10t}) as well as its interaction with group-mean centered total sessions for clients seeing therapist t (π_{11t}), group-mean centered baseline OQ scores for clients seeing therapist t , (π_{12t}), and error (r_{1ct}).

$$\beta_{1ct} = \pi_{10t} + \pi_{11t}(\text{Total sessions})_{1ct} + \pi_{12t}(\text{Baseline OQ})_{1ct} + r_{1ct}$$

Level 3: Therapists. Level 3 will estimate variation in OQ change between therapists based on experience. The level 2 intercept (π_{10t}) is a function of the mean rate of change for clients across all therapists (Y_{100}), the relationship between this variable and therapist experience (Y_{101}), and error (U_{10t}). The level 2 slopes (π_{11t} and π_{12t}) are a function of the grand mean intercept of each slope (Y_{110} and Y_{120}), their interaction with therapist experience (Y_{111} and Y_{121}), and error (U_{11t} and U_{12t}).

$$\pi_{10t} = Y_{100} + Y_{101}(\text{Experience})_{10t} + U_{10t}$$

$$\pi_{11t} = Y_{110} + Y_{111}(\text{Experience})_{11t} + U_{11t}$$

$$\pi_{12t} = Y_{120} + Y_{121}(\text{Experience})_{12t} + U_{12t}$$

Two-level: Costs and Cost-Effectiveness

Level 1: Clients. A linear relationship exists between total treatment costs and number of sessions since increases in costs are directly proportional to increases in sessions. Additionally, we did not examine changes in costs over time because costs increased at a constant rate over time from all perspectives. Thus, differences in costs between therapists with different experience levels are explored in a two-level model. Our Level 1 cost equation modeled between-client treatment costs as a function of the average cost for clients seeing therapist t (β_{0t}), group-mean centered total sessions for clients seeing therapist t (β_{1t}), as well as the residual (e_{ct}). Our Level 1 cost-effectiveness equation modeled CERs as a function of the average CER for clients seeing therapist t (β_{0t}), group-mean centered total sessions for clients seeing therapist t (β_{1t}), the group-mean centered baseline OQ score for clients seeing therapist t (β_{2t}), and the residual (e_{ct}). We excluded baseline OQ from our cost equations because baseline OQ was not expected to influence treatment costs, exclusively, over time.

$$\text{Cost}_{ct} = \beta_{0t} + \beta_{1t}(\text{Total sessions})_{ct} + e_{ct}$$

$$CER_{ct} = \beta_{0t} + \beta_{1t}(\text{Total sessions})_{ct} + \beta_{2t}(\text{Baseline OQ})_{ct} + e_{ct}$$

Level 2: Therapists. Level 2 modeled between-therapist variance in costs and CERs. Average costs for clients seeing therapist t (β_{0t}) were modeled as a function of the mean intercept for all clients in the sample (π_{00}), the interaction between this variable and therapist experience (π_{01}), and the residual (r_{0t}). The relationship between costs and total sessions (β_{1t}) were modeled as a function of the average intercept for all clients in the sample (π_{10}), the interaction between this variable and therapist experience (π_{11}), and the residual (r_{1t}).

Average CERs for clients seeing therapist t (β_{0t}) were modeled as a function of the mean intercept for all clients (π_{00}), the interaction between this variable and therapist experience (π_{01}), and the residual (r_{0t}). The relationship between CERs and total sessions (β_{1t}), as well as baseline OQ score (β_{2t}) were modeled as a function of the average intercept for all clients in the sample (π_{10} and π_{20}), the interaction between the respective variable and therapist experience (π_{11} and π_{21}), and the residual (r_{1t} and r_{2t}). These models were repeated for costs and CERs from each perspective with and without imputed values (equivalent to the sample mean) for missing baseline OQ scores.

Costs:

$$\beta_{0t} = \pi_{00} + \pi_{01}(\text{Experience})_{0t} + r_{0t}$$

$$\beta_{1t} = \pi_{10} + \pi_{11}(\text{Experience})_{1t} + r_{1t}$$

CERs:

$$\beta_{0t} = \pi_{00} + \pi_{01}(\text{Experience})_{0t} + r_{0t}$$

$$\beta_{1t} = \pi_{10} + \pi_{11}(\text{Experience})_{1t} + r_{1t}$$

$$\beta_{2t} = \pi_{20} + \pi_{21}(\text{Experience})_{2t} + r_{2t}$$

APPENDIX F

AVERAGE CLIENT SLOPES BETWEEN THERAPISTS

We found significant variability in average client change rates (i.e., slopes) between therapists after controlling for baseline OQ score and total number of per client sessions. Average therapist slopes were normally distributed and the average was 6.58 (range = -0.60 – 15.97). Two therapists had negative slopes, indicating that, on average, their clients worsened over time, but only slightly. The top 5 therapists had slopes between 12.38 and 15.97 and the bottom 5 therapists had slopes between -.60 and 1.82. These results are comparable to those from Lutz et al. 2007 (average slope = 6.90, range = 2.82 – 11.43). Our results should be interpreted with caution due to the small sample size, particularly the low number of observations per therapist (1 – 6 clients; approximately 30% of therapists only had 1 – 2 clients).

APPENDIX G

COST-EFFECTIVENESS METRICS

Table G1

Cost-Effectiveness Ratios from Multiple Perspectives by Therapist Experience for the Full Sample

	Therapist experience					
	Provider	2 years Client	Summed	Provider	3 years Client	Summed
Mean	\$11.09	\$38.57	\$49.66	\$11.93	\$18.57	\$30.50
Median	\$13.57	\$19.55	\$32.54	\$20.60	\$31.59	\$50.90
Std. Deviation	\$107.01	\$284.86	\$383.01	\$143.47	\$258.67	\$399.27

Note. $N = 208$; four clients had undefined CERs (i.e., a denominator of 0 due to having the same OQ score at baseline and treatment termination). The number of sessions $F(1, 210) = 0.03$, $p = .87$, and therapist year of experience, $F(1, 210) = 0.59$, $p = .45$, did not significantly differ between these four clients and the rest of the sample.

Table G2

Incremental Cost-Effectiveness Ratios from Multiple Perspectives

	Full sample N = 212		Reliable change subsample N = 85	
	3 rd year	2 nd year	3 rd year	2 nd year
Mean costs	\$529.32	\$390.08	\$609.63	\$437.45
Mean efficacy ^a	11.87	8.11	28.94	28.94
Provider perspective: ICER	\$37.03		Undefined	
Mean costs	\$890.59	\$829.29	\$1,015.92	\$754.82
Mean efficacy ^a	11.87	8.11	28.94	28.94
Client perspective: ICER	\$16.30		Undefined	
Mean costs	\$1,419.91	\$1,219.37	\$1,625.55	\$1,192.26
Mean efficacy ^a	11.87	8.11	28.94	28.94
Summed perspective: ICER	\$53.34		Undefined	

APPENDIX H

WILLINGESS-TO-PAY THRESHOLDS

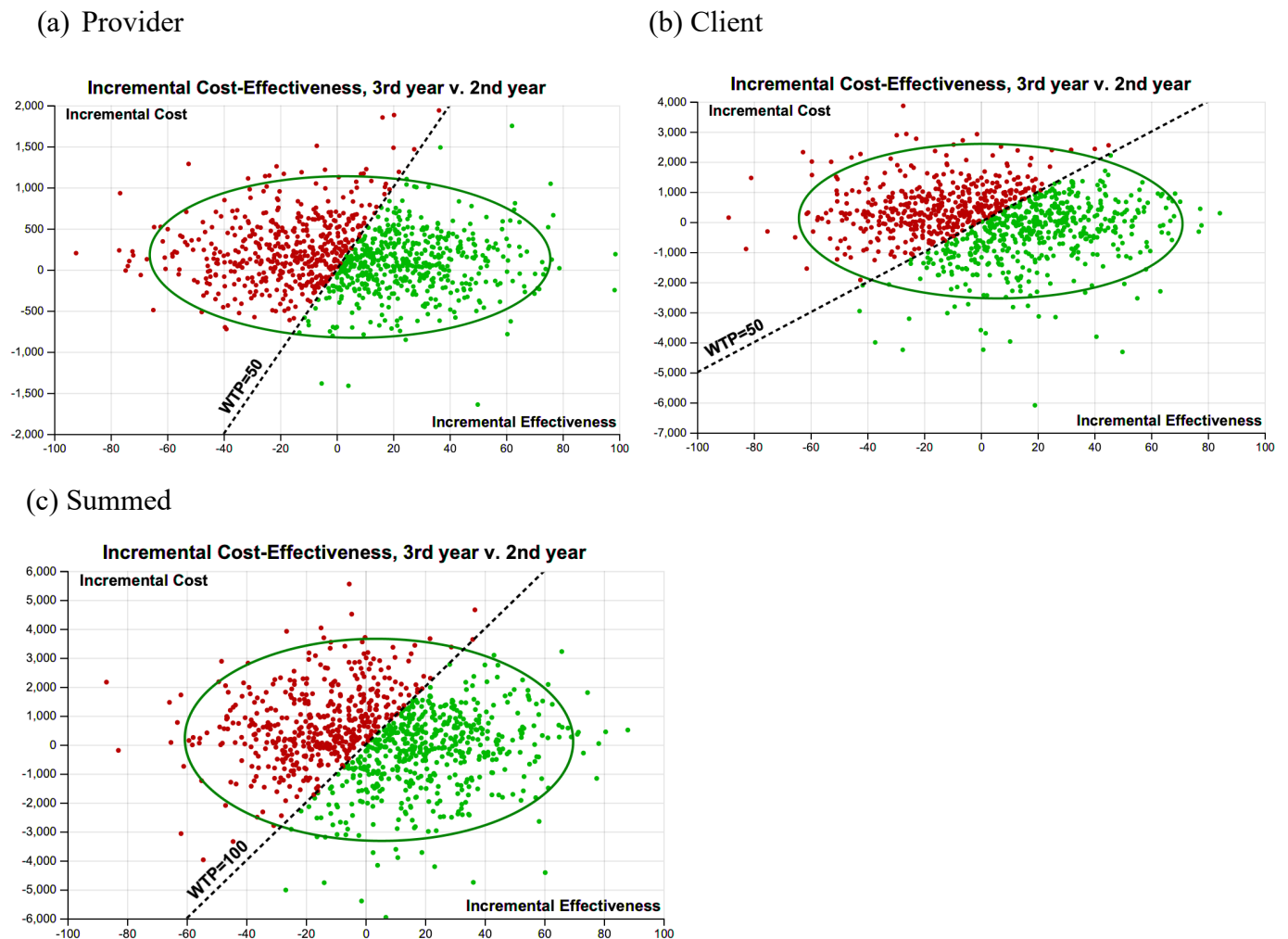
A willingness-to-pay threshold is the maximum amount of money a decision-maker is willing to pay for an effective treatment to produce one unit of change. This threshold directly influences the perceived cost-effectiveness of a treatment (Fenwick, Marshall, Levy, & Nichol, 2006). From a willingness-to-pay perspective, clients seeking mental health services decide how much money they are willing to pay to receive treatment, therapists decide how much money they are willing to be paid to provide mental health treatment, and universities decide how much of their own resources they are willing to spend to provide mental health services. In practice, clients may have limited funds for therapy. Similarly, salaries for therapists are limited by where they have been offered employment (if they are not self-employed). A university's mental health budget, for example, would be a reflection of their willingness-to-pay threshold for providing mental health services to their students and community. It is important to calculate cost-effectiveness from multiple perspectives because different decision-makers (e.g., clients, therapists, or universities) have different willingness-to-pay thresholds for providing or receiving mental health services (Neumann et al., 2016; Yates 1996, 1999).

APPENDIX I

COST-EFFECTIVENESS SCATTER PLOTS

Figure I1

Incremental Cost Effectiveness Scatter Plots with Willingness to Pay Thresholds



Note. ICE scatterplots were generated using 1,000 re-samples. Ellipses illustrate 95% confident intervals. Green dots reflect occurrences in which CBT delivered by 3rd-year therapists is more cost-effective (i.e., has higher cost and higher effectiveness or lower cost and higher effectiveness such that each ICER is at or below a given WTP threshold) than CBT delivered by 2nd-year therapists.

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