Only connect: The working alliance in computer-based cognitive behavioral therapy

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ABSTRACT

The limited role of therapists in some technology-based interventions raises questions as to whether clients may develop a 'working alliance' with the program, and the impact on relationships with a therapist and/or treatment outcomes. In this study, the Working Alliance Inventory (WAI), and an adapted version for technology-based interventions (WAI-Tech), were administered within a subsample ($n = 66$) of cocaine-dependent individuals participating in a randomized trial evaluating the efficacy of Computer-Based Training for Cognitive Behavioral Therapy (CBT4CBT) as an adjunct to treatment as usual (TAU). Results suggest the WAI-Tech has relatively similar psychometric characteristics as the standard WAI; however the 'bond' subscale scores were lower on the WAI-Tech [$F(1,52) = 5.78$, $p < .05$]. Scores on the WAI-Tech were not associated with cocaine use outcomes, whereas total scores on the WAI for those assigned to TAU were associated with the percentage of days abstinent from cocaine ($r = .43$, $p < .05$). There was little evidence that adding a technology-based intervention adversely affected the working alliance with a therapist in this sample. These preliminary findings suggest some concepts of working alliance may apply to computer-based CBT, yet the function of the alliance may be different in technology-based interventions than in face-to-face psychotherapies.

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Introduction

Multiple challenges to dissemination of evidence-based therapies, such as cognitive behavioral therapy (CBT), have spurred development of numerous technology-based interventions (see reviews, Cuijpers et al., 2009; Kaltenthaler et al., 2006; Marks et al., 2009; Richardson, Stallard, & Velleman, 2010; Spek et al., 2007). Technology-based interventions offer many potential benefits, such as providing broader access to empirically supported treatments, consistency in treatment delivery (i.e., increased fidelity), decreasing the demands on clinician time and clinic resources, and cost effectiveness (Carroll & Rounsaville, 2010; Marks & Cavanagh, 2009; Marsch & Dallery, 2012). For the treatment of substance use disorders, many technology-based interventions have demonstrated positive treatment outcomes (e.g., Bickel, Marsch, Buchhalter, & Badger, 2008; Budney et al., 2011; Carroll et al., 2008; Gustafson et al., 2011; Hester, Delaney, & Campbell, 2011; Ondersma, Chase, Svikis, & Schuster, 2005). However, there has been relatively little research regarding how these technology-

based interventions may lead to changes in substance use (i.e., mediators/mechanisms of action), the extent to which findings regarding active ingredients of the parent therapy pertain to the technology-based intervention, and what treatment factors are predictive of better outcomes.

In traditional clinician-delivered interventions, the working alliance (also referred to as the therapeutic alliance) is one of the most consistent predictors of positive treatment outcomes (Horvath, Del Re, Fluckiger, & Symonds, 2011; Martin, Garske, & Davis, 2000). In the treatment of substance use disorders, a positive working alliance early in treatment has been associated with greater engagement, retention, and early improvements in substance use (Gibbons et al., 2010; Ilgen, McKellar, Moos, & Finney, 2006; Meier, Barrowclough, & Donmall, 2005; Meier, Donmall, McElduff, Barrowclough, & Heller, 2006). However, the relationship between alliance and outcome is complex, as reports of the robustness of the alliance as a predictor of treatment outcomes has been somewhat mixed after accounting for prior symptom change (e.g., Barber, Connolly, Crits-Christoph, Gladis, & Siqueland, 2000; Falkenstrom, Granstrom, & Holmqvist, 2014; Strunk, Brotman, & DeRubeis, 2010; Webb et al., 2011). Furthermore, several studies have found that therapist variability in the alliance (i.e. variability between therapists) rather than patient variability (i.e., variability within therapists), more strongly relates to treatment outcomes

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(Baldwin, Wampold, & Imel, 2007; Crits-Christoph et al., 2009). Although there is some disagreement regarding the magnitude of therapist effects, multilevel models applied to clinical trial data have shown that 5–10% of the total variability in outcomes is attributable to between-therapists differences (Crits-Christoph et al., 1991; Elkin, Falconnier, Martinovich, & Mahoney, 2006; Kim, Wampold, & Bolt, 2006). Because many technology-based interventions significantly alter the role of the therapist (with treatment implemented either independently from the therapist or significantly reduced amount of therapist contact), it is unclear how this change in delivery might affect important treatment processes such as the working alliance.

As an emerging area of research, there are few studies that specifically address the concept of a working alliance in technology-based interventions. Of those that have examined the working alliance within this context, the predominant focus has been on the alliance with a *clinician* guiding or providing the technology-based intervention, rather than a working alliance with the technology-based program itself. Most studies indicate alliance ratings with a clinician/therapist guiding/providing the technology-based intervention are in line with ratings found in face-to-face therapies (Andersson et al., 2012; Cook & Doyle, 2002; Kay-Lambkin, Baker, Lewin, & Carr, 2011; Knaevelsrud & Maercker, 2007; Preschl, Maercker, & Wagner, 2011; Sucala et al., 2012). However, a pilot study explored participants' alliance ratings with a computerized CBT package for depression using a modified version of the Agnew Relationship Measure (Agnew-Davies, Stiles, Hardy, Barkham, & Shapiro, 1998), with the word "package" replacing "therapist" in the original scale, and found participants' average ratings of alliance with the package were above the neutral midpoint, suggesting a positive relationship (Ormrod, Kennedy, Scott, & Cavanagh, 2010). Also, although significant decreases in depression were found after receiving the computerized CBT package, these outcomes were not related to the alliance with the computerized package (Ormrod et al., 2010). These were some of the first known reported results regarding a potential alliance with a computerized CBT program, as well as its relation to treatment outcomes, yet the study was limited by a small sample ($n = 16$) and did not include a comparison condition.

Overall, relatively little is known about whether the concept of the working alliance is relevant to technology-based interventions, how this potential alliance may affect the relationship with a therapist, and whether it influences outcome in a manner similar to that of traditional therapist-client working alliance. There have been reports that some clients do describe a form of relationship with computerized interventions (Bickmore, Caruso, Clough-Gorr, & Heeren, 2005; Bickmore, Gruber, & Picard, 2005; Kaplan, Farzanfar, & Friedman, 2003; Ormrod et al., 2010). For example, Bickmore, Gruber, et al. (2005) reported a computerized intervention for physical activity adoption that included a 'relational agent' (e.g., animated computer character that simulated face-to-face conversation using social-emotional behaviors) produced higher working alliance ratings than a comparison intervention without the relational qualities. Furthermore, results of qualitative interviews from participants engaged in a telephone-based health behavior intervention indicated users described the system in ways indicative of having a personal relationship with it (e.g., "friend", "helper", "mentor") (Kaplan et al., 2003). While these findings suggest clients may develop some form of working alliance with technology-based interventions, the nature of the alliance and how it may differ from traditional features of a working alliance is relatively unexplored.

To investigate this concept, we adapted a widely-used and well validated measure of the working alliance (WAI; Horvath & Greenberg, 1989) and implemented it in the context of a randomized trial evaluating the effectiveness of Computer-Based Training for Cognitive Behavioral Therapy (CBT4CBT; Carroll, Kiluk, Nich, Gordon, et al., 2014). The purpose of the present study was to: (1) provide a preliminary psychometric evaluation of the newly adapted version of the WAI designed to measure the alliance with a technology-based intervention (WAI-Tech), including reliability and construct validity; (2) to evaluate the extent to which using a technology-based intervention as an adjunct to standard treatment might affect participants' reported alliance with their clinicians; and (3) explore the contribution of a working alliance with a technology-based intervention to substance use treatment outcomes, such as treatment retention and frequency of substance use.

Methods

Overview of the study: treatments, participants, and assessment schedule

As described in detail in the main study report (Carroll, Kiluk, Nich, Gordon, et al., 2014), 101 cocaine-dependent individuals enrolled in an outpatient methadone program were randomized to one of two treatment conditions for a period of 8-weeks: (1) standard methadone maintenance ('treatment as usual', TAU) or, (2) TAU plus CBT4CBT. The TAU condition consisted of daily methadone maintenance along with weekly group and/or individual sessions with a substance use counselor. Those randomized to the CBT4CBT condition were also provided with weekly access to the computer program in a small private room within the clinic. Briefly, CBT4CBT (Carroll et al., 2008, 2009) is a computer-based version of CBT for substance use disorders (Carroll, 1998) that uses videos, games, cartoons, and interactive exercises to teach CBT concepts and coping skills in an engaging manner. It includes 7 'modules' that cover a specific CBT skill/topic area, with each module taking approximately 45 min to complete. It is highly user-friendly, requires no previous experience with computers and no reading skills, as all material presented in text is read aloud by a narrator. A research staff member guided participants through their initial use of the CBT4CBT program and was available to answer questions each time participants accessed the program. Participants were assessed before treatment, twice weekly during treatment, and at the 8-week treatment termination point, as well as at several time points following treatment termination (1-, 3-, and 6-months after termination). Post-treatment interviews were obtained from 98 of the 101 individuals randomized (97%); complete follow-up data were available for 93 of those randomized (92%).

Individuals were eligible who met criteria for current (past 30 days) cocaine dependence. Individuals were excluded only if (1) they failed to meet Diagnostic and Statistical Manual – Fourth Edition (DSM-IV; American Psychiatric Association, 1994) criteria for current cocaine dependence, (2) had an untreated/unstabilized psychotic disorder or had current suicidal/homicidal ideation such that more intensive treatment was needed, or (3) could not read at a 6th grade level in order to provide written informed consent and complete study assessments. All participants provided informed consent and the procedures followed were in accord with the standards of the Yale University School of Medicine Human Investigations Committee.

The Substance Use Calendar (Carroll et al., 2004) was used to assess substance use, which is a calendar-based assessment of self-reported substance use similar to the Timeline Follow Back (Fals-Stewart, O'Farrell, Freitas, McFarlin, & Rutigliano, 2000; Sobell & Sobell, 1992). Participant self-reports of drug use/abstinence were verified through urine toxicology screens that were obtained at every assessment visit. Rates of discordance between participant