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Computer Fluency, Access to Technology, and Attitudes Towards Technologically-Based Therapeutic Tools Among Practicing Clinicians

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COMPUTER FLUENCY, ACCESS TO TECHNOLOGY, AND ATTITUDES TOWARDS TECHNOLOGICALLY-BASED THERAPEUTIC TOOLS AMONG PRACTICING CLINICIANS

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Researchers in the field of dissemination and implementation of evidence-based practices have begun to develop computer-assisted therapies and computer-based training programs in an attempt to increase the level of evidence-based care in clinical practice settings. However, little to no work has attempted to understand potential barriers to the use of these technological tools in clinical practice settings (e.g., whether therapists are willing and able to use them). For these tools to be utilized successfully by therapists on a broad scale, therapists would need a certain level of computer skills, access to computer equipment, and willingness to adopt the technology in treatment. This study seeks to begin to understand these factors using survey data from a national sample of mental health counselors (N = 392). Respondents reported on their computer fluency and access to technology, in addition to completing two measures of therapist attitudes that were designed for this study: the Computer-Assisted Therapy Attitudes Scale (CATAS) and the Computer-Based Training Attitudes Scale (CBTAS). Confirmatory factor analyses supported a predicted two factor structure (belief in efficacy, comfort with using) for each scale. Encouragingly, overall therapist attitudes towards these tools were positive, their computer fluency levels were moderately high, and many (90.8%) reported having access to a computer at work. Analyses also examined predictors of attitudes. Predictors of positive attitudes included higher general openness to new treatments, higher computer

fluency, and identifying with a cognitive-behavioral theoretical orientation. Results suggest that on the whole, therapists may be likely to integrate these tools into their clinical practice. However, therapists may vary both in their willingness and ability to use these tools.

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CHAPTER ONE

INTRODUCTION

Technology in Mental Health Service Delivery and Training

Difficulty in transporting therapeutic techniques deemed "evidence-based" by researchers to practicing therapists has led to national calls for improving the lines of communication between research and practice (e.g., President's New Freedom Commission on Mental Health, 2003). Recent years have seen researchers in the field of dissemination and implementation of evidence-based practice turn toward the use of technology as a means to bridge this gap between science and practice. This seems a logical and enticing step given the growing ubiquity of computers and other technological equipment in today's society (Rainie, 2010). Additionally, many treatments with the greatest empirical support (i.e., cognitive-behavioral therapies; CBT) are highly structured and translate well into computer adaptations (Spek, Cuijpers, Nyklicek, Riper, Keyzer, & Pop, 2007).

Technological advances have the potential to impact the treatment of youth mental health issues in a myriad of ways. First, the use of technology during treatment has the potential to extend the availability of services for youth and may require less training for therapists to reach desired levels of proficiency in treatment delivery (Carroll, Martino, & Rounsaville, 2010). For example, research has already demonstrated promising results for the use of computer technologies in treatment through virtual reality exposures for anxiety-disordered patients (Parsons & Rizzo, 2008), as well as computer-based (i.e., therapies that a client can complete over the computer without any contact

from a therapist; Spek et al., 2007) and computer-assisted (i.e., computer programs that assist a therapist in the delivery of therapy; Khanna & Kendall, 2010) therapies.

The use of technology also holds the potential to enhance therapist training by providing new and engaging ways for therapists to be trained in interventions and to increase access to training in new treatments for those therapists who may be unable to take advantage of more traditional training methods due to geographic or time constraints (Beidas, Koerner, Weingardt, & Kendall, 2011; Dimeff et al., 2009; Sholomskas et al., 2005). Examples of promising forms of technology-based training approaches include online training programs (Dimeff et al., 2009; Sholomskas & Carroll, 2006), virtual patients (e.g., Kenny et al., 2007), videoconferencing, virtual classrooms, and two-way live satellite broadcasts (Weingardt, 2004).

While these technologies present exciting new avenues for the dissemination and implementation of EBPs, they also represent a shift in the way treatment and training are delivered. Just as the field has encountered barriers to the dissemination of new practices, the field may also encounter barriers to the dissemination of these new technologies. In particular, for these tools to be utilized successfully, therapists must be both able and open to using them. While some research has begun to investigate client and family member openness to computerized therapies (e.g., Cunningham & Wuthrich, 2008; Stallard, Velleman, & Richardson, 2010), little attention has been paid to whether therapists are willing or able to use technology in treatment through the use of computer-assisted therapies or to engage in technology-based training platforms. Specifically, for these tools to be utilized successfully by therapists on a grand scale, therapists would require a certain level of computer skills (i.e., the ease and understanding one has with

computers), access to computer equipment, and willingness to adopt the technology in treatment and training.

This study seeks to understand the extent to which these factors exist among currently practicing therapists by collecting data from randomly selected members of a national practice organization. Results from this study will inform the field about existing obstacles for the usage of technologically-based therapies and training tools and target areas for future research in how to overcome these barriers.

Computer-Assisted Therapy

There is growing empirical support for the use of stand-alone self-help computer-based CBT programs with minimal to no therapist support (e.g., Griffiths & Christensen, 2006; Spek et al., 2007; van den Berg, Shapiro, Bickerstaffe, & Cavanagh, 2004). These stand-alone programs have several advantages over traditional therapeutic approaches (e.g., lower cost, greater accessibility, avoidance of social stigma associated with seeking therapy). However, several recent meta-analyses and other reviews of computer-based CBT programs for anxiety and depression in adults have consistently found larger effect sizes in outcome measures for those programs that incorporated therapist support compared to those interventions that did not (Anderson & Cuijpers, 2009; Newman, Szkodny, Llera, Przeworski, 2011; Spek et al., 2007). Therefore, while stand-alone programs appear to be the most cost-conscious and resource-friendly interventions, the literature suggests that computer therapies will likely require at least some levels of therapist involvement to maximize positive outcomes.

Computer-assisted therapies differ from computer-based therapies in that they are designed to be implemented with therapist guidance and face-to-face contact (Khanna &

Kendall, 2008). The area of computer-assisted therapy is relatively new, but there is compelling evidence for its effectiveness. Research suggests that, when computer programs are used in conjunction with face-to face therapy time, the total amount of therapist time is reduced without sacrificing treatment gains (Wright et al., 2005). Computer-assisted therapies have been developed for a variety of disorders in adults, including anxiety and mood disorders (see Newman et al., 2011 for a review), and substance use disorders (e.g., the CBT4CBT program, Carroll et al., 2008). For example, the Coordinated Anxiety Learning and Management (CALM) program is a computer-assisted intervention for panic disorder, generalized anxiety disorder, social anxiety disorder, and post-traumatic stress disorder (Craske et al., 2009). The program contains 8 modules that are designed to be administered with minimal training by novice therapists. CALM guides both the therapist and the client through a flexible CBT treatment protocol and has shown preliminary evidence for efficacy.

Much less work has been done examining the efficacy of computer therapies for youth. However, what evidence exists also supports the notion that therapist involvement may be indicated for optimal outcomes. Though recent work has shown promising results for computer-based programs (e.g., the *Cool Teens CD-ROM,* Cunningham et al., 2009; BRAVE-ONLINE, March, Spence, & Donovan, 2009), all have included at least some therapist involvement, such as weekly or biweekly contact via phone or email to promote motivation, assess comprehension of material, monitor treatment progress, and provide feedback. Additionally, it can be argued that youth may be more in need of therapist support than adults, particularly at younger ages. In some cases, parents could potentially be relied upon to enforce completion of a computer-based program, but it is likely that

greater levels of therapist contact is needed for successful treatment of youth. Preliminary evidence has been established for the efficacy of a computer-assisted therapy program for anxious youth (Khanna & Kendall, 2010), further supporting the notion that computer-assisted therapy may be a viable treatment option for youth.

In sum, computer-assisted therapy has so far been largely dominated by treatments for adults, with the majority of programs designed for anxiety and depressive disorders. Clearly, much more work remains to be done in developing and testing these therapies for a broader range of issues as well as developing programs specifically targeted to youth. Overall, the available evidence is promising, and computer-assisted therapies are an exciting way to expand the availability of evidence-based treatments. However, the use of these programs in treatment requires therapists to depart significantly from traditional therapeutic methodology. Consequently, before attempts are made to disseminate these programs on a broad scale, it is important to examine their acceptance on the part of practicing therapists as well as their feasibility for use.

Computer-Based Therapist Training

A recent review of therapist training methodologies found that simply instructing therapists to read treatment manuals or having them attend training workshops does not lead to either skill acquisition or adoption of the treatment into practice (Herschell, Kolko, Baumann, & Davis, 2010). Research has demonstrated that the intensity of therapist training (i.e., inclusion of feedback, supervision) plays a crucial role in obtaining therapist behavioral change (Carroll, et al., 2010; Lochman et al., 2009; Sholomskas et al., 2005). However, live training and supervision methods are often quite time-intensive and expensive to conduct (Martino, 2010; Carroll et al., 2010).

Furthermore, evidence for the efficacy of didactic teaching efforts in training is scant, and the inclusion of active learning strategies in training programs has been encouraged (Beidas & Kendall, 2010). Computer-based trainings are an ideal medium in which didactic training can incorporate active and interactive learning components. There are several benefits to computer-based trainings. These include reduced cost, individualization in pace, flexibility in scheduling, and greater learner engagement through interactive formats (Dimeff et al., 2009; Weingardt, 2004).

One of the primary means in which computer technology has been adapted in therapist training has been in the creation of computer or web-based training programs (e.g., Cohen & Mannarino, 2008; Dimeff et al., 2009; Sholomskas & Carroll, 2006). Preliminary evidence for the efficacy of computer-based therapist trainings in treatment protocols has been established. Several trials comparing training methods for clinical therapists have found interactive, web-based training programs to outperform the provision of treatment manuals (Dimeff et al., 2009; Sholomskas & Carroll, 2006; Sholomskas et al., 2005). For example, Sholomskas and Carroll (2006) conducted a randomized comparison of a manual only and a manual plus interactive CD-ROM training program for the Twelve-Step Facilitation (TSF) treatment protocol. At baseline and 3 weeks post training, therapists were asked to demonstrate TSF skills in a videotaped role-play, which was then coded by independent raters for adherence and competency. Both conditions improved their ability to deliver TSF skills at the post training assessment time point. However, the manual plus CD-ROM training significantly outperformed the manual only condition.

Computer technologies are also being developed to enhance therapist trainings in other ways. For example, Kenny et al. (2007) presented preliminary evidence for the use of a virtual patient (a 16-year old conduct disordered individual) designed to assist in developing clinical interviewing skills and practicing differential diagnosis. Virtual patients may allow therapists to practice these skills with characters who may not present with a clear cut diagnosis. Additionally, telehealth methodologies have begun to be adapted in therapeutic training. Telehealth refers to the use of any telecommunication tool to deliver health services, from a simple phone call to providing live feedback from a distance through a combination of video and telephone technology. Videoconferencing over the internet has been one effective means by which researchers have trained therapists in remote locations in specific therapeutic techniques. (Funderbunk, Ware, Altshuler, & Chaffin, 2008; Vismara, Young, Stahmer, Griffith, & Rogers, 2009).

Though much remains to be done in developing computer-based training tools, the current literature demonstrates great promise for the role technology will play in training therapists in EBPs. In order to maximize the benefits of implementing these training tools, it is necessary to have an understanding of the potential barriers that exist among practicing therapists that may prevent them from utilizing such tools. Though research is exploring a variety of technological methodologies to be used in training (such as the virtual patients and telehealth methods described above), this study will focus on the barriers facing the usage of computer and web-based training programs, which are currently the most commonly used technologically based trainings.

Barriers to Therapist Use of Technology

The integration of computer technology with therapeutic services and training programs for therapists is likely inevitable. However, to date, little work has attempted to understand potential barriers to the use of computer-assisted therapies or computer-based trainings in clinical practice settings. The literature in both of these areas suggests that there may be certain general barriers to the use of technological tools in mental health treatment. Specifically, understanding the technological resources typically available to practicing therapists will inform the extent to which computerized therapies can be feasibly administered within clinic settings as well as the ability of therapists to engage in online trainings. For example, a therapist's level of enthusiasm about using a computer-assisted therapy program is meaningless if that therapist does not have easy access to a computer, particularly if they happen to be working in an underfunded community clinic. While some recent work has examined the infrastructure of children's community mental health centers (Schoenwald et al., 2008), little work has explored the technological capacities of clinics. Understanding the accessibility of computers to therapists, the capabilities of these computers (e.g., DVD players, high-speed internet, and webcams), as well as the presence of any technological support staff will inform the field of obstacles to the dissemination of technological tools.

Additionally, given the later adoption of technologies by older generations (Bunz, 2009), it may not be safe to assume that all practicing therapists have the computer fluency required to utilize computers as either a core therapeutic component or training mechanism. Participants in online training trials (e.g., Dimeff et al., 2009; Sholomskas & Carroll 2006) were often required to have access to a computer in order to participate.

Furthermore, Sholomskas et al. (2005) reported that four participants who passed initial screening procedures were unable to complete the web training due to either lack of access or computer ability. An understanding of average levels of computer fluency would enable program development to be tailored to therapist's abilities. Furthermore, if therapists demonstrate lower levels of computer fluency, development of introductory program modules to assist in program navigation may be indicated.

Finally, it is important to understand the general attitudes towards these technological programs on the part of practicing therapists if such programs are to be widely disseminated. Conceptual models of effective implementation of EBPs highlight the role of therapist attitudes as an important component for consideration in implementation efforts (e.g.,Damschroderet al., 2009; Glisson & Schoenwald, 2005; Proctor et al., 2009). Specifically, Damschroder and colleagues (2009) discuss both an individual's positivity towards a new technology as well as their belief in their ability to engage with the technologies as particularly important factors to consider. Additionally, preliminary evidence has linked negative attitudes towards treatment research with lower self-reported use of EBP (Nelson & Steele, 2007), and positive attitudes towards evidence-based treatments (EBTs) with greater self-reported use of EBTs (Jensen-Doss, Hawley, Lopez, & Osterberg, 2009), suggesting that therapist attitudes may be an important factor impacting therapist use of EBP.

Barriers Specific to Computer-Assisted Therapy

Barriers specific to computer-assisted therapy may arise in the form of negative or apprehensive therapist attitudes towards the use of these tools. Few studies have surveyed therapists' attitudes towards computer therapies, and to our knowledge, none have

specifically examined therapists' attitudes towards computer-assisted therapies. The extant literature on attitudes towards computer-based therapy indicates that therapists typically have more negative attitudes towards computerized therapy than their clients (Waller & Gilbody, 2009), though a study looking at therapist attitudes towards computer-based therapy for youth found that over half of the therapists surveyed reported positive attitudes towards computerized CBT as a prevention program or as an intervention for mild to moderate problems (Stallard, Richardson, & Velleman, 2010). However, attitudes towards computer-assisted therapies may differ from those towards computer-based therapy, as the latter seeks to fully replace the therapist; in contrast, computer-assisted therapies are tools that the therapist employs.

Though not specifically asked about computer-assisted therapies, surveyed therapists have generally reported that computerized CBT has potential as a supplemental tool to face-to-face therapy (Stallard, Richardson, et al., 2010; Waller & Gilbody, 2009; Whitfield & Williams, 2004). Additionally, therapists who administered the CALM computer-assisted program for anxiety reported high satisfaction with the program after using it for a year (Craske et al., 2009). While encouraging, more research is needed in this area to better understand potential barriers to the uptake of computer-assisted therapy at the therapist level. For example, it is possible that therapists might have concerns about their clients' openness to computer-assisted therapies. A recent study looking specifically at the attitudes towards the use of computer-based therapy among youth and their parents (Stallard, Velleman, et al., 2010) found that over half of the youth surveyed reported that their preferred method of treatment was to meet with someone face-to-face. While parents were more positive, they cited lack of face-to-face time as a potential

barrier. It is possible therapists may be hesitant to employ these tools if they fear that there may be resistance on the part of their clients or their clients' parents. Additional potential attitudinal barriers include the extent to which therapists feel that computer-assisted therapies will promote or impede treatment progress for their clients. Therapists may also feel that the computer could inhibit rapport, lead to premature treatment termination, or that they may become over-reliant on the computer program.

Barriers Specific to Computer-Based Therapist Trainings

Little work has examined the barriers specifically associated with computer-based trainings. Dimeff et al. (2009) examined barriers specific to online training for Dialectical Behavior Therapy (DBT), but these were primarily focused on technological and organizational barriers specific to the training program and implementation of the learned skills, such as certain web pages not loading correctly or having a theoretical orientation discordant with implementing DBT. It is likely, however, that there are therapist-level barriers to implementing computer-based trainings. For example, therapists may be skeptical that they can be adequately trained through a technological medium. They may also be concerned that they will be unable to ask questions or receive assistance during training. Additionally, while it may be acceptable for therapists to take time off of work to attend a training workshop, it's possible that they may face opposition towards using time at work to engage in computer-based training programs. Consequently, it may be important to understand how likely therapists are to participate in these programs on their own time.

Effective computer-based therapy trainings must be user-friendly, engaging, and interactive. Such computer programs require significantly more production time and cost

than text-driven programs (Weingardt, 2004). Prior knowledge of the technological capabilities in clinics could inform the development of such trainings. For instance, interactive web-based trainings require high-speed internet access to run, particularly for the interactive components. Additionally, more technological training methodologies such as virtual patients and videoconferencing often require more advanced technological equipment which may not be readily available in clinics. Knowing the prevalence of this equipment will inform the field about the extent to which such equipment would have to be provided to the clinics in order for these training tools to be utilized.

Aims and Hypotheses

Technology will likely play an increasingly important role in the delivery of and training in evidence-based practices. However, there is a lack of information to guide the field about the barriers that these technologically-based tools stand to face on the part of practicing therapists. The purpose of this study was to begin to fill in this gap of knowledge by surveying a sample of mental health service providers from a national practice organization. Specifically, the survey will assess the availability of technological resources needed to engage in computer-assisted therapy and computer-based trainings in therapists' workplaces, the computer fluency levels of practicing therapists, as well as therapist attitudes towards using computer-assisted therapies and computer-based trainings.

Specific Aim 1. A review of the literature found no measure currently in existence that was designed to assess therapists' attitudes towards computer-assisted therapy or computer-based training. Therefore, the first aim of this study was to develop and assess the psychometric properties of two measures designed specifically for this

study: the Computer-Assisted Therapy Attitudes Scale (CATAS) and the Computer-Based Training Attitudes Scale (CBTAS). Specifically, the factor structure, internal consistency, and construct validity of each measure will be examined.

Hypothesis 1a. It was expected that both the CATAS and the CBTAS would demonstrate a two-factor structure, with each scale containing a Comfort subscale and a Belief in Efficacy subscale.

Hypothesis 1b. It was expected that the CATAS and CBTAS would demonstrate acceptable levels of internal consistency, as measured by a Cronbach's alpha greater than .70 (Nunally & Bernstein, 1994). Preliminary evidence for the construct validity of these measures will be assessed under Specific Aim 4 (see below).

Specific Aim 2. The second aim of this study was to examine the self-reported computer fluency levels of practicing therapists, as well as the availability of technological resources available in therapists' workplaces. Given that there is little research to guide expectations for the technological capacities of therapist work environments, no specific hypotheses were made about the technological resources available in clinics. Similarly, no specific hypotheses regarding overall levels of computer fluency were made.

Hypothesis 2a. Previous research has demonstrated that age and computer fluency skills are negatively correlated (e.g., Bunz, 2009). Therefore, it was hypothesized that in this sample, computer fluency would be inversely related to therapist age.

Specific Aim 3. The third aim of this study was to determine overall therapist attitudes towards computer-assisted therapies and computer-based training, as measured

by the items on the CATAS and CBTAS. Given the lack of prior research on this topic, no specific hypotheses were made about the expected directionality of attitudes.

Specific Aim 4. The final aim of this study was to examine predictors of therapist attitudes, as measured by the CATAS and the CBTAS. Hypothesized predictors of attitudes included therapist openness to new treatments, therapist computer fluency, therapist access to technology, and client population; if supported, these relationships will provide preliminary evidence for the construct validity of the CATAS and CBTAS. Exploratory analyses examined age, gender, identification with a particular theoretical orientation, and work environment as predictors of CATAS and CBTAS total and subscale scores. Specific hypotheses follow:

Hypothesis 4a. Therapists who are open to new practices in general may also be more open to new treatment and training technologies. Therefore, it was hypothesized that those therapists who reported greater levels of general openness to new treatments would report more positive attitudes towards computer-assisted therapy and computer-based training.

Hypothesis 4b. Therapists with lower computer fluency might be more apprehensive about using technological treatments and trainings, both out of concern of their own ability to engage with these tools as well as the ability of technology to function as a therapeutic medium. Therefore, it was hypothesized that those therapists who reported lower levels of computer fluency would report more negative attitudes towards computer-assisted therapy and computer-based training.

Hypothesis 4c. Therapists with greater access to technology may be more willing to incorporate technological treatments and trainings into their practice because the

resources needed to engage in these tools are readily available. Therefore, it was hypothesized that therapists who report greater access to technology in their work environment would be more positive towards computer-assisted therapies and computer-based trainings than those working in a low access environment.

Hypothesis 4d. In some ways, youth are the ideal target for computer interventions. The younger generations are generally thought to be much more adaptive to new technologies, and particularly adept at the use of computers as compared with older generations (Bunz, 2009). Furthermore, it has been argued that to ignore the potential of utilizing technological aids in treatment is not only a missed opportunity, but potentially a barrier to engagement and rapport (Nelson & Nelson, 2010). Therefore, it was hypothesized that those therapists working primarily with children would be more positive towards computer-assisted therapies than those who work with a primarily adult population.

CHAPTER TWO

METHOD

Participants

Contact information for 600 therapists was purchased from the American Mental Health Counselors Association (AMHCA). The AMHCA is the only non-profit organization made up exclusively of mental health counseling professionals, and is a subdivision of the American Counseling Association, which is the largest national association of professional counselors. Clinical members of the AMHCA are required to have a master's degree in counseling or other closely related field, and typically provide services such as assessment and diagnosis, treatment planning, therapeutic interventions, psychoeducation, preventative interventions, and crisis management (see www.amhca.org/about/facts). The AMHCA membership community is approximately 70% female. Several studies of mental health services delivery have found master's level therapists to be prevalent service providers (Aarons & Sawitzky, 2003; Addis, 2002; Simon & Ludman, 2010), with counselors making up a large portion of this group (e.g., Garland et al., 2010). Therefore, members of the AMHCA represent therapists likely to be targeted in future dissemination efforts and are an important population to target.

Participants were contacted by mail to participate in a national survey (see Procedure, below). A total of 422 surveys (70.2%) were returned. Twenty-seven of these were returned blank, indicating that the recipient did not want to participate. An additional four surveys were returned completed by participants who indicated they had retired from clinical practice; these participants were excluded from analysis. This yielded a final sample of 392 participants, a 65.3 percent participation rate. This

participation rate is comparable to or higher than prior surveys with similar populations (e.g., Hawley, Cook, & Jensen-Doss, 2009; Aarons, McDonald, Sheehan, & Walrath-Greene, 2007).

Table 1 provides information regarding the clinical and demographic characteristics of the sample. The majority of participants were female (n = 282, 71.9%), the average age of participants was 57.2 years (*SD* = 10.2), and participants were predominantly Caucasian (n = 333, 84.9%). Gender of participants in this sample was comparable to the gender composition of the AMHCA. The most commonly identified theoretical orientation was CBT (n = 208, 53.1%), and the work environment most commonly reported was Private Practice (n = 238, 60.7%). The majority of the sample reported working with both adults and children (n = 236, 60.2%), with 255 (65.1%) reporting working with youth and 341 (87.0%) working with adults.

Procedure

Therapists were contacted by mail and asked to complete the Therapist Computer Access and Attitudes Survey (TCAAS), which included the CATAS, CBTAS, and several additional measures (see below for more details about additional measures and survey development; a copy of the survey can be found in Appendix A). A pencil-and-paper survey mail-out method was selected for this study over a more convenient Internet survey format to avoid under-sampling therapists with lower computer access and fluency skills. The survey was designed and administered in accordance with the Tailored Design Method (Dillman, Smyth, & Christian, 2009*)*. Mailings were conducted in four waves and all correspondence was personalized and hand-signed. A few days prior to the initial survey mail-out, a pre-notice letter was sent informing respondents that a

questionnaire was coming. In wave 2, the TCAAS was sent with a detailed cover letter highlighting the importance of the survey and included a self-addressed return envelope with first-class stamps, as well as a 2 dollar noncontingent incentive. Providing a token of appreciation in advance of participation is recommended as a way of showing trust in respondents (Dillman et al., 2009), and the 2 dollar incentive has shown to be a cost-effective incentive for practicing therapists (Hawley et al., 2009). One week after the initial survey mail-out, thank you post-cards were sent to express appreciation for responding and express hope that the survey will be returned soon if it had not yet been completed. Finally, if respondents had not returned their surveys within a month, a replacement questionnaire was sent along with a personalized letter. Surveys received within four months of the first mail-out date were included in analysis.

Survey Development and Measures

A review of the literature found no measure currently in existence that was designed to assess either the technological capabilities of mental health clinics, the general level of computer fluency among therapists, or therapists' attitudes towards computer-assisted therapy and computer-based training. Therefore, portions of the TCAAS were designed specifically for the purposes of this study. The complete survey amounted to 72 items, and included the CATAS and CBTAS, a technological access scale, and items related to the clinical and demographic background of the respondent. Additionally, the TCAAS contained an adapted computer fluency scale and a measure of general therapist openness to new treatments. Pilot testing of the TCAAS was conducted with ten local therapists attending an in-person clinical training workshop. Therapists received a 5-dollar gift-card for providing feedback. Following pilot testing, several

minor modifications to the instrument were made to make it more user-friendly (e.g., rewording of questions, changes to the survey layout).

Development of the Computer-Assisted Therapy Attitudes Scale (CATAS) and Computer-Based Therapy Attitudes Scale (CBTAS). The CATAS and CBTAS were designed to directly assess therapist attitudes towards computer-assisted therapy and computer-based trainings. On both the CATAS and CBTAS, respondents rate how much they agree with a series of statements using a 5-point Likert scale (Strongly Disagree to Strongly Agree) Negative items are reverse scored such that higher scores indicate more positive attitudes towards computer-assisted therapies and computer-based trainings. Item creation was guided by the literature review on barriers towards the adoption of these technologies and question formation adhered to principles put forth in the Tailored Design Method. Eleven items were written to assess computer-assisted therapy attitudes on the CATAS, and 13 items were written to assess computer-based training attitudes on the CBTAS. As noted above, a two-factor structure for each measure was expected, with Efficacy (belief in efficacy) and Comfort (comfort with using) subscales for each measure. After factor analyses (see below), both the CATAS and CBTAS had 8 items and both demonstrated two factor structures. As one of the aims of this study was to assess the psychometric properties of the CATAS and CBTAS, further psychometric data for these measures is reported in the Results section.

Technological Access Scale (TAS). This portion of the survey was designed to assess the technological capability of the therapist's work environment, and is composed of 6 items. For example, therapists were asked to rate how easily accessible computers are to therapists in their workplace using a 5-point Likert scale, and to check off the

technology items (e.g, desktops, laptops, High Speed Internet) available in their workplace from a list of technological tools. Respondent data from items in this section are used to descriptively assess levels of technology capacity in different therapist work environments, as well as whether or not therapist-rated ease of access and satisfaction with their technology predicts therapist attitudes towards computer-assisted therapies and computer-based trainings.

Additional Measures in the TCAAS

Computer Fluency Scale (CFS; Bunz, 2004; Heinseen, Glass, & Knight, 1987). This measure is designed to measure the computer fluency and comfort of the therapist. Items in this section were created by adapting items from two existing measures, the Computer-Email- Web Fluency Scale (CEW- Fluency Scale; Bunz, 2004) and The Computer Anxiety Rating Scale (CARS; Heinssen, et al., 1987). The CEW-Fluency Scale is a 52-item self-report measure that has been validated to assess computer and internet fluency. The CARS is a 19-item self-report measure of computer related anxiety with higher scores associated with lower levels of computer experience and expectations for computer task performance. These measures were adapted and shortened into the current CFS for use in the TCAAS. The adapted measure consisted of 5 items drawn from the CEW-Fluency Scale that assessed therapists' use of, and prior experience with, computers (e.g., length and frequency of use, prior computer coursework), as well as 7 items drawn from the CARS and the CEW-Fluency Scale that assessed computer comfort and self-report of computer ability (e.g., I am comfortable using computers, I am able to keep up with advances happening in the computer field). Only the latter 7 items were used in analyses. On these items, respondents rated how much they agreed with

these 7 statements using a 5-point Likert scale (Strongly Disagree to Strongly Agree) to assess their general attitudes towards computers. Negative items were reverse scored, with a total possible score of 35. Higher scores indicate greater comfort with computers. Cronbach's alpha in this sample equaled .80, indicating adequate reliability.

Evidence-Based Practice Attitudes Scale-Openness Subscale (EBPAS Openness; Aarons, 2004). Therapists also completed the Openness subscale of the EBPAS, a four-item measure designed to assess a therapist's general willingness to utilize new treatments and manualized therapy protocols, with a total possible score of 12. The EBPAS factor structure is well supported in the literature (e.g., Aarons, et al., 2007), and therapist scores on the EBPAS are thought to be inversely related to therapist age and work experience (e.g., Aarons,2004). Cronbach's alpha for this subscale in this sample was equal to .88, indicating good reliability.

Clinical and demographic items. Therapists were also asked to answer questions about their educational and clinical background, client population, and workplace.

CHAPTER THREE

RESULTS

Preliminary Analyses

Prior to analysis, a double entry data procedure was used to ensure accuracy, and data were screened for outliers. Skewness and kurtosis were calculated for all items on the CATAS, CBTAS, CFS, and EBPAS Openness scales, and variables were all found to be normally distributed. Means and standard deviations were calculated for total scores on the CATAS, CBTAS, CFS, and EBPAS Openness scales. Given that therapists often identified with more than one theoretical orientation, their open-ended descriptions of their theoretical orientations were classified as "Yes" or "No" according to whether or not a therapist identified with a particular theoretical orientation (Psychodynamic, CBT, Family Systems, Eclectic, Other). Additionally, therapists who reported more than one theoretical orientation (e.g., psychodynamic and CBT) were also coded as Eclectic. Similar procedures were used to classify therapist-reported work environment (Community Agency, Private Practice, Hospital, School or University, or Other), as a number of respondents reported working in more than one work environment.

Specific Aim 1: Psychometric Properties of the CATAS and CBTAS.

Aim 1, Hypothesis 1a proposed that the CATAS and the CBTAS would both demonstrate a two-factor structure, with each measure containing a "Belief in Efficacy (Efficacy)" and "Comfort with Using (Comfort)" subscale. To examine this, confirmatory factor analysis (CFA) was conducted using MPlus (Muthén & Muthén, 2010) software. Items were specified to load on either the Comfort or Efficacy subscales based on a priori consideration during the instrument construction. Analyses were conducted separately for

the CATAS and the CBTAS. Factor loadings were examined to determine if items loaded appropriately, and items loading less than .40 were removed (see Table 2 for removed items). Residuals were examined to determine whether any residuals should be correlated due to similarly worded questions. A single-factor structure for each measure was also compared to the two-factor solution using a chi-squared difference test, to determine whether the two-factor model represented the most parsimonious factor structure.

CATAS. The initial model did not have good fit to the data ($\chi^2(38) = 138.041$, $p < .001$; root mean squared error of approximation (RMSEA) = .082; standardized root mean squared residual (SRMR) = .052). Three items were removed due to poor loadings (I am confident that I can learn the skills to use computer assisted therapy, My clients are not computer savvy enough to use computers in therapy, I have sufficient access to computers to use them in session). The residuals of several similarly worded items were specified as correlated to account for the similar sentence structure. The revised model fit the data adequately ($\chi^2(13) = 27.636$, $p = 0.010$; RMSEA = 0.054; SRMR = 0.024). To examine whether a more parsimonious model might fit the data equally well, a single factor model was then tested with only the retained items. This model did not fit the data ($\chi^2(14) = 62.811$, $p < .001$; RMSEA = .094; SRMR =.041), and a chi-squared difference test indicated that this model fit significantly worse than the two-factor model ($p < .05$), suggesting that the two-factor model be retained. The final measurement model (8 items) for the CATAS is displayed in Figure 1.

CBTAS. The initial model did not have good fit to the data ($\chi^2(60) = 205.810$, $p < .001$; RMSEA = 0.079; SRMR = 0.051). Modification indices suggested that one indicator (I can successfully learn new treatments through a computer-based training

program) initially specified to load on the efficacy subscale would load better on the apprehension subscale. Additionally, three items were removed due to poor loading (I do not have the computer abilities to navigate through a computer-based training program, I am not confident in my ability to successfully navigate through a computer-based training program, I don't have sufficient access to computers to use a computer-based training). An additional two items were removed that loaded equally well on both subscales (I would participate in a computer-based training program during work hours, I would participate in a computer-based training program during on my own time). The residuals of several similarly worded items were specified as correlated to account for the similar sentence structure.This revised model fit the data well ($\chi^2(16) = 18.626$, $p = 0.289$; RMSEA = 0.021; SRMR = 0.015).To examine whether a more parsimonious model might explain the data equally well, a single factor model was then tested with only the retained items. This model adequately fit the data (χ^2 (17) = 28.495, $p = 0.040$; RMSEA = 0.042; SRMR = 0.023), but a chi-squared difference test indicated that this model fit significantly worse than the two-factor model ($p < .05$), suggesting that the two-factor be retained. The final measurement model for the CBTAS (8 items) is displayed in Figure 2.

Aim 1, Hypothesis 1b stated that the CATAS and CBTAS would demonstrate acceptable levels of internal consistency, as measured by a Cronbach's alpha greater than .70. Table 3 provides Cronbach's alpha values for each measure, as well as for each subscale. CATAS and CBTAS Total scores and both Efficacy subscales demonstrated good levels of internal consistency (αs ranged from .85-.87). While both CATAS and CBTAS Comfort subscales were slightly lower (αs were .66 and .68, respectively), both of these scales were only three items, indicating that examining inter-item correlations

may be a better estimate of reliability (Cortina, 1993) . All inter-item correlations for both the CBTAS Comfort and CATAS Comfort subscales were greater than .35, above the recommended .20 for scale inclusion, suggesting adequate reliability (Kline, 1986).

Specific Aim 2: Therapist Computer Fluency and Access

Overall, self-reported therapist computer fluency was fairly high in this sample, with a mean score of 27.8 (*SD* = 4.06) out of a total of 35 points**.** As hypothesized (Hypothesis 3a), the Pearson correlation coefficient between age and the CFS score was -.168 (p = .001), supporting an inverse relationship between these two variables, a small effect by Cohen's (1988) standards, which defines *r* = .10 as a small effect (see Table 4).

Table 5 provides information regarding therapist-reported access to various technological resources for the sample as a whole, in addition to reported access by work environment (private practice, mental health agency, school/university). The majority of the sample reported having access to at least one computer in their work place (n = 356, 90.8%). Less than half of the sample (n = 158, 40.3%) reported having access to a technological support staff. Frequently available forms of technology (i.e., those reported with 50% or greater frequency) in this sample included desktop computers (68.3%), laptop computers (58.5%), high speed internet (81.2%), word processing software (64.9%), and DVD players (50.1%). Items reported with moderate frequency (25-49% present) included computer microphones (25.4%), digital media software (41.5%), webcams (27.0%), and computer speakers (43.5%). Items reported less than 25% of the time included tablet computers (14.6%), netbook computers (6.6%), audio recorders (21.9%), video conferencing equipment (17.8%), video recorders (17.8%), and virtual

reality equipment (0.5%). Seventy-five percent of respondents reported that they were satisfied with the technological equipment in their workplace.

Overall ease of access to technology ratings were high (M = 4.4, SD = 1.15). As a portion of therapists reported working in more than one work environment, differences in ease of access scores were examined using a series of t-tests comparing each work environment to the rest of the sample to examine potential differences by work setting. Given the number of t-tests calculated, a more conservative test of significance ($p < .01$) was used. Results suggested that therapists in private practice reported significantly less ease of access (M = 4.3, SD = 1.27, p = .003, Cohen's d = .29) than those who reported working elsewhere, a small effect by Cohen's (1988) standards, which define values of .2, .5, and .8 as small, medium, and large effects, respectively. No other significant differences were noted (all ps > .05).

Specific Aim 3: Determining Overall Therapist Attitudes.

To examine overall therapist attitudes towards computer-assisted therapies and computer-based trainings, one sample t-tests comparing the mean total scores for the CATAS and CBTAS, to the values representing neutral attitudes (24 for both the CATAS and CBTAS) provided information regarding the overall positive or negative nature of therapist attitudes in each domain (i.e., whether therapists are more positive or negative in attitude). Additionally, one sample item-level t-tests comparing mean item scores to the item neutral score of 3 were conducted to further examine therapist attitudes about specific items on the CATAS and CBTAS. Tables 6 and 7 provide the results of this analysis. Mean values for the CATAS and CBTAS Total scores were both significantly higher than scores corresponding to neutral attitudes (ps < .001, CATAS Total Cohen's d

= .22, CBTAS Total Cohen's d = .76), suggesting that, overall, therapists have positive attitudes towards both computer-assisted therapies and computer-based training programs, with small and moderate effect sizes, respectively.

However, significant variability in attitudes was noted (CATAS *SD* = 6.55; CBTAS *SD* = 7.68). Additionally, while overall scores indicated positive attitudes, t-tests conducted on the individual items of the CATAS and CBTAS provide more specific information about therapist attitudes (Tables 2). Therapists attitudes were significantly more positive than neutral (i.e., greater than 3) for the majority of items on both the CATAS and CBTAS (effect sizes ranged from .12 – 1.15, small to large effects). However, therapists also agreed with a statement that computers in therapy would interfere with rapport ($M = 3.31$, $p < .001$, Cohen's d = .28, a small effect), agreed with a statement that they were apprehensive about using computers during therapy ($M = 3.14$, $p < .05$, Cohen's d = .12), and disagreed with a statement that using computer programs in therapy would lead to better outcomes for their clients ($M = 2.78$, $p < .001$, Cohen's d = .26, a small effect). Additionally, overall, mean therapist attitudes did not differ significantly from neutral on an item stating that individual questions would not be answered through a computer-based training program and on an item that therapy is too complicated to be taught through a computer-based training program.

Specific Aim 4: Predictors of Therapist Attitudes

Analyses examining predictors of attitudes explored the relationship between therapist attitudes on the CATAS and CBTAS and therapist demographic (age and gender), clinical characteristics (theoretical orientation, work environment, years of clinical experience, client population), EBPAS Openness scores, computer fluency, and

ease of access to technology. All predictors were first examined individually using simple regression analyses in SPSS, unless otherwise noted. Effect sizes were evaluated using conventional guidelines, such that R^2 values of .01, .09, and .25 indicated small, medium, and large effects, respectively (Cohen, 1988). Tables 8-10 provide the univariate results and effect sizes for these analyses.

Age. Age significantly predicted attitudes towards computer-based training programs as measured by the CBTAS total score, such that older respondents reported more negative attitudes ($p < .05$, $R^2 = .01$, a small effect*)*. Age did not significantly predict the CATAS Total or subscale scores, or the CBTAS subscale scores.

Gender. Gender did not significantly predict any of the attitude scale scores (*p*s > .05).

Theoretical Orientation. Therapists who identified CBT as part of their theoretical orientation had more positive attitudes towards computer-assisted therapy as measured by the CATAS total score ($p < .05$, $R^2 = .015$, a small effect) and Efficacy scale ($p < .01$, $R^2 = .03$, a small effect) than those who did not. Therapists who identified with CBT also had more positive attitudes towards computer-based training as measured by the CBTAS Total score and its subscales (all *p*s < .01, $R^2 = .02$ - .022, small effects). Identification with CBT did not relate to the CATAS Comfort scores.

Therapists who identified Psychodynamic/Psychoanalytic as part of their theoretical orientation had less positive attitudes towards computer-assisted therapy as measured by the CATAS Efficacy scale than therapists not identifying as Psychodynamic/Psychoanalytic ($p < .05$, $R^2 = .013$, a small effect). Identification with a Psychodynamic/Psychoanalytic orientation did not significantly relate to the CATAS

Total or Comfort scores. Therapists who identified with a Psychodynamic/Psychoanalytic orientation also had less positive attitudes towards computer-based training as measured by the CBTAS Total score ($p < .01$, $R^2 = .025$, a small effect) and Efficacy scale ($p < .001$, $R^2 = .037$, a small effect) compared to therapists who did not. Identification with a Psychodynamic/Psychoanalytic orientation did not relate to the CBTAS Comfort scores.

Therapists who self-identified as eclectic or with multiple theoretical orientations had more negative attitudes towards computer-assisted therapy as measured by the CATAS Total score and both of its subscales than therapists with a single theoretical orientation ($ps < .05$, $R^2 = .013$ - $.017$, small effects). Identification with an Eclectic orientation did not relate to CBTAS Total, Efficacy, or Comfort scores.

Work Environment. Given the low frequency of respondents who reported working in a hospital (n = 13, .03%), the hospital environment was not included in analyses. Therapists working in private practice reported more negative attitudes towards computer-assisted therapy as measured by the CATAS Total score ($p < .01$, $R^2 = .026$, a small effect), and the CATAS Efficacy scale ($p < .05$, $R^2 = .03$, a small effect). No significant differences were noted on the CATAS Comfort scale or the three CBTAS scales.

Therapists working at a community agency reported more positive attitudes towards computer-assisted therapy as measured by the CATAS total score, as well as ratings on the CATAS Efficacy scale ($ps < .05$, $R^2 = .01$ - $.012$, small effects). No significant differences were noted on the CATAS Comfort scale, or the three CBTAS scales.

Therapists working in a school or university setting reported more positive attitudes towards computer-assisted therapy as measured by the CATAS Efficacy scale ($p < .05$, $R^2 = .012$, a small effect). No significant differences were noted on the CATAS Total and Comfort scales, or the three CBTAS scales.

Years of Clinical Experience. Greater years of experience was associated with more negative attitudes towards both computer-assisted therapy and computer-based training, as measured by the CATAS Total score , CATAS Efficacy score, and the three CBTAS scale scores (all ps $< .01$, $R^2 = .026$ - .039, small effects). Years of clinical experience did not significantly predict CATAS Comfort scores.

EBPAS Openness. *Aim 4, Hypothesis 4a* stated that therapists reporting greater levels of general openness to new treatments would demonstrate more positive attitudes. As expected, EBPAS Openness subscales were associated with more positive attitudes as measured by the CATAS and CBTAS scales (all ps $< .001$, $R^2 = .06$ - .20, small to medium effects).

Computer Fluency. *Aim 4, Hypothesis 4b* proposed that those therapists who reported lower levels of computer fluency (as measured by the CFS) would report more negative attitudes towards computer-assisted therapy and computer-based training. As expected, CFS predicted both CATAS and CBTAS total scores, such that higher ratings of computer comfort and fluency predicted more positive attitudes (ps $< .001$, $R^2 = .09$ and.13, respectively, medium effects). Additionally, CFS scores were positively associated with the Efficacy and Comfort subscales of each measure (all ps $< .001$, $R^2 =$ .03- .15, small to medium effects). Thus, hypothesis 4b was supported.

Ease of Access to Technology. *Aim 4, Hypothesis 4c* stated that therapists reporting greater access to technology in their work environment would demonstrate more positive attitudes. To examine this, therapist-rated ease of access to technology (5 point Likert scale) was used to predict CATAS and CBTAS scores. As hypothesized, greater ease of access was associated with more positive attitudes towards both computer-assisted therapy and computer-based training, as measured by the CATAS and CBTAS scales (all *p*s < .05, R^2 = .012 - .017, small effects). Additionally, differences in attitudes were examined using therapist-reported satisfaction with their technological equipment (yes or no) as a predictor of attitudes. Surprisingly, therapists who reported satisfaction with their technological equipment had less positive attitudes as measured by the CATAS Efficacy scale, although the size of the effect was small ($p < .05$, $R^2 = .01$). No other differences in attitudes were noted.

Client Population. *Aim 4, Hypothesis 4d* proposed that therapists who reported working with youth would demonstrate more positive attitudes than those working with adults. To examine this, simultaneous regression analyses were conducted using dummy coded variables to represent client population, with the CATAS and CBTAS Totals and subscale scores as the dependent variables. Two dummy coded variables were created (works with adults, works with both children and adults), using therapists working with children as the reference group. Contrary to the hypothesis, client population did not significantly predict attitudes towards computer-assisted therapy or computer-based trainings, as none of the overall regression equations were significant and neither of the predictor variables were significant in any analysis (*p*s > .05).

Finally, to identify independent predictors of attitudes, all of the predictors (age, gender, theoretical orientation, work environment, years of experience, ease of technological access, satisfaction with technology, CFS scores, EBPAS Openness scores, and client population) were entered as simultaneous predictors of CATAS and CBTAS total and subscale scores. Table 8 provide the results of the regression analysis for the CATAS and CBTAS Totals, respectively; Tables 9 and 10 provide results for the CATAS and CBTAS subscales, respectively. The collective set of predictors explained at least 20% of the variance in the various attitude scales (R^2 = .20-.33), medium to large effects (Cohen, 1988). For CATAS and CBTAS total scores, CATAS Comfort, and CBTAS Efficacy scores, only the CFS and EBPAS Openness scale remained significant predictors of therapist attitudes. Higher CFS and EBPAS Openness scores were positively related to all four scales (all *p*s < .05). For the CATAS Efficacy subscale, only the EBPAS Openness subscale emerged as a significant predictor, with higher EBPAS Openness scores related to greater belief in the efficacy of computer-assisted therapy (p < .001). CFS scores, EBPAS Openness scores, identification with CBT, and working in private practice significantly predicted CBTAS Comfort scores, such that higher scores on the CFS and EBPAS Openness, a CBT orientation, and working in private practice predicted higher CBTAS Comfort scores (CFS and EBPAS Openness *p*s < .001, CBT orientation and private practice *p*s < .05).

CHAPTER FOUR

DISCUSSION

Technology has great potential to be used as a tool in therapy as well as to enhance therapist trainings in evidence-based practices. However, if these technologies are to have an impact on clinical practice, therapists must be both able and willing to use them. To date, little work has examined therapists' abilities and openness to using these technologies. This study is the first to specifically examine therapist computer fluency, therapist access to technology, and therapist attitudes towards the use of technology in therapy and training, using a national sample of mental health counselors. Results from this study also provide important information about predictors of therapist attitudes to the use of these technologically-based therapeutic tools.

Encouragingly, this sample of therapists appeared to have the computer skills needed to utilize computer-based therapy and training. Overall self-reported therapist computer fluency was fairly high in this sample, with mean item ratings on the CFS of 3.97 out of 5 (i.e., therapists agreed with statements that indicate competence with computers). To the best of the author's knowledge, no previous study has examined therapist computer fluency. This is therefore an encouraging finding, and suggests that many of the practicing therapists surveyed reported feeling confident in their computer abilities. Overall, developers of future technologically-based training and therapy tools should feel moderately confident in the basic computer competency of therapists. However, it should be noted that self-report computer fluency scores are considered a less accurate measure of computer abilities compared to practical measures and may overestimate true computer skill (Grant, Malloy, & Murphy, 2009). Thus, it is possible

that with increasingly sophisticated technology, developers of new technologically-based tools will need to be mindful of the computer skill level of their target users. Additionally, given that there was variability in CFS scores, developers would likely benefit from providing optional tutorials for utilizing computer-assisted therapies and computer-based training tools, as well as offering optional support systems for those therapists without access to technological support resources in their work environment.

Therapists must have access to appropriate equipment in order to engage with computer-assisted therapies and computer-based trainings, as well as other modes of technologically based therapeutic tools. This study therefore examined therapist access to technology among mental health counselors. On the whole, results were again encouraging, as over 90 percent of the sample reported having access to at least one type of computer in the workplace. However, while computer presence was by far the norm, it was by no means ubiquitous, with nearly a tenth of the sample reporting no access to any computer, and 6.4 % (n = 25) reporting no access to any technological equipment at work. Furthermore, approximately 20% of the sample reported no access to high speed internet, which is required for utilizing a number of web-based program features. Additionally, therapists working in private practice were more likely to have less access to technology than therapists in other work settings. Thus, while one proposed advantage of these tools is providing access to new trainings and treatments to therapists in hard to reach areas (e.g., rural communities; McClosky, 2011; Weingardt, 2004), there appears to be a subset of therapists for whom use of these technologies is not currently an option. Such therapists may need alternative means of support (e.g., more traditional in-person training methodologies) to promote the integration of EBPs into their practice.

Finally, therapists' attitudes toward these technologies were examined. Given that no prior research on this topic had been conducted, the first step in this research was to develop a measure of these attitudes. Results suggest that both the CATAS and the CBTAS demonstrate good psychometric properties as an assessment tool for therapist attitudes towards computer-assisted therapies and computer-based trainings. Both scale totals demonstrated good internal consistencies, and a two-factor structure with Efficacy and Comfort subscales in each measure was supported. All four subscales also demonstrated adequate reliability. The scales also correlated with constructs that would be expected to relate to attitudes toward these technologies, such as openness to new treatments and computer fluency, providing initial support for the construct validity of this measure. Incorporating these measures into future studies of computer-assisted therapies and computer-based trainings could further examine the utility of these scales as predictors of therapist use of these tools.

Encouragingly, the average level of therapist attitudes in this sample was positive, suggesting that overall, mental health counselors are receptive towards the use of computer-assisted therapies and computer-based trainings. Given that attitudes are thought to be positively associated with EBP use (e.g., Jensen-Doss et al., 2009), this suggests that, given the appropriate resources, many therapists may be likely to incorporate computer-assisted therapies and computer-based trainings into their practice. However, this item-level analysis pinpointed several areas where therapists may experience more reservation about the use of these tools. Specifically related to computer-assisted therapies, therapists reported concerns that using computers in therapy would interfere with rapport, and that the use of these tools would not necessarily lead to

better outcomes for their clients. Consequently, attempts to disseminate computer-assisted therapy programs would likely benefit from directly providing therapists information about rapport and outcomes with the use of these programs. Additionally of note, there were two specific questions on the CBTAS on which therapists endorsed neutral attitudes (my individual questions will not be answered; therapy is too complicated to be taught through a computer-based training). These results suggest that attempts to disseminate computer-based trainings might benefit from providing therapists with information about ways their individual questions will be answered and how the complexities of therapy will be addressed through the training program to obtain buy-in from the therapists.

The final aim of this study was to examine therapist predictors of attitudes as measured by the CATAS and CBTAS. More positive attitudes towards computer-assisted therapies were associated with higher computer fluency, greater openness to new treatments, fewer years of work experience, greater ease of access to technological equipment, identification with a CBT theoretical orientation, and working in a community agency. However, when predictors were examined simultaneously, only computer fluency and greater openness to new treatments were significant independent predictors of CATAS scores, suggesting that many of the previously mentioned variables' (e.g., years of experience) relationship to attitudes is a function of their relationship to openness and computer fluency. Moreover, computer fluency did not predict therapist belief in the efficacy of computer-assisted therapies, but was related to lower comfort with the idea of using computer-assisted therapies. This suggests that while therapist belief in the efficacy of computer-assisted therapies varies as a function of

both openness and computer fluency, therapist apprehension about using computer-assisted therapy is related primarily to their own comfort with computers.

A similar pattern was seen in therapist attitudes towards computer-based trainings. More positive attitudes towards computer-based trainings were associated with higher computer fluency, greater openness to new treatments, fewer years of experience, and identification with a CBT theoretical orientation. Unlike attitudes towards computer-assisted therapies, work environment was not related to attitudes towards computer-based trainings, perhaps because computer-based trainings are perceived as less constrained by the resources of the work environment (e.g., trainings do not require computers in session rooms, but can be accessed on therapists' own time). When predictors were examined simultaneously, only computer fluency and greater openness to new treatments were significant independent predictors of CATAS scores. In contrast to computer-assisted therapies, computer fluency was independently related to both therapists' belief in the efficacy of computer-based trainings as well as their comfort with using them. It is possible that those therapists with less understanding of the current breadth of computer programming may feel as though technology does not have the capability to provide adequate training.

Additionally, identification with a CBT theoretical orientation and working in private practice were also independently related to greater comfort with using computer-based training programs. One potential explanation for these findings is that, given CBT treatment is often highly structured, therapists aligned with CBT may perceive treatments likely to be translated into web-based formats as consistent with their orientation, and therefore have less apprehension regarding their use. For therapists working in private

practice, the flexibility afforded in this setting may lead therapists to be less concerned about using and learning from technological trainings, and therefore more comfortable using them. These results suggest that therapists not aligned with CBT or not working in private practice may be less likely to engage in these training programs due to their apprehension about using these tools. These therapists may more strongly benefit from knowledge of how these programs address their concerns (e.g., that therapy is too complicated to be taught in a computer-based format). For example, one potential way to address this may be to clearly emphasize the strengths and limitations of a training program upfront, as well as stressing the continued use of process factors in therapy along with whatever new clinical skill is being taught.

Results should be interpreted within the context of study limitations. AMHCA members represent only a subset of all those who provide mental health services and it is possible that attitudes may differ in another population of mental health service deliverers (e.g., social workers). Future research should also examine the factor structures of the CATAS and CBTAS in other populations of therapists who provide mental health services. Furthermore, despite the number of predictors examined, additional variance in therapist attitudes towards both computer-assisted therapies and computer-based trainings remained to be explained. This suggests that additional factors not assessed in this study may contribute to therapist attitudes towards these technological tools. Potential predictors to be explored in future research include educational background and prior experience with and use of EBP, as well as more detailed information regarding therapists' primary clinical population. Additionally, it may be that the measurement of some of the included predictors was not sensitive enough to fully capture the relationship

between those predictors and attitudes. For example, to keep the survey to a manageable size, some constructs, such as technological access, were assessed using brief measures. It is possible that longer measures of these constructs might be more sensitive and better able to explain variability in attitudes.

However, this study also had several strengths. The survey had a high response rate (> 65%) that yielded a large sample size, as well as representation from a national sample of practicing mental health counselors practicing in a variety of clinical settings. In addition, a recent national survey of therapists reporting on EBPAS subscale mean scores found that, nationally, mean Openness item scores were approximately 2.76 (*SD* = .75) across a number of disciplines (e.g., social work, psychology, medicine). This sample demonstrated comparable openness (item *M* = 2.65, *SD* = .78; Aarons et al., 2010), lending further support for the generalizability of findings. Most importantly, this was the first study to address therapist level barriers to computer-assisted therapies and computer-based trainings by examining both therapists' ability to use and attitudes towards engaging with these tools.

Summary/Conclusions

The CATAS and CBTAS appear to be reliable measures to assess therapist attitudes towards computer-assisted therapies and computer-based trainings, with preliminary support for their validity. Researchers developing these new and exciting technological tools to increase the level of evidence-based practices in mental health settings should be encouraged by the findings that on the whole, self-reported computer fluency levels were high, the majority of therapists reported access to computers in their work environment, and that therapists held positive attitudes towards both computer-

assisted therapies and computer-based trainings. However, given the individual variability noted in computer fluency and attitudes, developers of these technologically-based tools but may do well to include additional options (e.g., tutorials) designed to assist those therapists with lower computer fluency to navigate their use, as well as provide therapists with specific information related to concerns noted on the CATAS and CBTAS. The exploration of technology as a medium to increase the prevalence of EBPs among practicing therapists is an exciting venture, and promises to continue to develop quickly. Knowledge of therapist barriers to the use of these technologies should be carefully used to inform future training and therapy tools in order to maximize their benefit.

REFERENCES

Aarons, G. A. (2004). Mental health provider attitudes toward adoption of evidence-based practice: The Evidence-Based Practice Attitude Scale (EBPAS). *Mental Health Services Research*, *6*(2), 61-74

Aarons, G. A., Glisson, C., Hoagwood, K., Kelleher, K., Landsverk, J., & Cafri, G. (2010). Psychometric properties and U.S. National norms of the Evidence-Based Practice Attitude Scale (EBPAS). *Psychological Assessment*, *22*(2), 356-365. doi:10.1037/a0019188

Aarons, G. A., McDonald, E. J., Sheehan, A. K., & Walrath-Greene, C. M. (2007). Confirmatory factor analysis of the Evidence-based Practice Attitude Scale (EBPAS) in a geographically diverse sample of community mental health providers. *Administration & Policy in Mental Health & Mental Health Services Research*, *34*(5), 465-469. doi:10.1007/s10488-007-0127-x

Aarons, G. A., & Sawitzky, A. C. (2006). Organizational climate partially mediates the effect of culture on work attitudes and staff turnover in mental health services. *Administration and Policy in Mental Health and Mental Health Services Research*, *33*(3), 289-301. doi:10.1007/s10488-006-0039-1

Addis, M. E. (2002). Methods for disseminating research products and increasing evidence-based practice: Promises, obstacles, and future directions. *Clinical Psychology: Science and Practice*, *9*(4), 367-378. doi:10.1093/clipsy/9.4.367

Andersson, G., & Cuijpers, P. (2009). Internet-based and other computerized psychological treatments for adult depression: A meta-analysis. *Cognitive Behaviour Therapy*, *38*(4), 196-205. doi:10.1080/16506070903318960

Beidas, R. S., & Kendall, P. C. (2010). Training therapists in evidence-based practice: A critical review of studies from a systems-contextual perspective. *Clinical Psychology: Science and Practice*, *17*(1), 1-30. doi:10.1111/j.1468-2850.2009.01187.x

Beidas, R. S., Koerner, K., Weingardt, K. R., & Kendall, P. C. (2011). Training research: Practical recommendations for maximum impact. Advance online publication. *Administration and Policy in Mental Health,* doi: 10.1007/s10488-011-0338-z

Bunz, U. (2004). The Computer-Email-Web (CEW) Fluency Scale – Development and validation. *International Journal of Human-Computer Interaction, 17*(4), 279-506. doi: 10.1207/s15327590ijhc1704_3

Bunz, U. (2009). A generational comparison of gender, computer anxiety, and computer-email-web fluency. *Studies in Media & Information Literacy Education, 9*(2), 54-69. doi: 10.3138/sim.9.2.003

Carroll, K. M., Ball, S. A., Martino, S., Nich, C., Babuscio, T. A., Nuro, K. F., & ... Rounsaville, B. J. (2008). Computer-assisted delivery of cognitive-behavioral therapy for addiction: A randomized trial of CBT4CBT. *The American Journal of Psychiatry*, *165*(7), 881-888. doi:10.1176/appi.ajp.2008.07111835

Carroll, K. M., Martino, S., & Rounsaville, B. J. (2010). No train, no gain? *Clinical Psychology: Science and Practice*, *17*(1), 36-40. doi:10.1111/j.1468-2850.2009.01190.x

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.

Cohen, J., & Mannarino, A. P. (2008). Disseminating and implementing trauma-focused CBT in community settings. *Trauma, Violence, & Abuse*, *9*(4), 214-226. doi:10.1177/1524838008324336

Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology, 78*(1), 98-104.

Craske, M. G., Rose, R. D., Lang, A., Welch, S., Campbell-Sills, L., Sullivan, G., & ... Roy-Byrne, P. P. (2009). Computer-assisted delivery of cognitive behavioral therapy for anxiety disorders in primary-care settings. *Depression and Anxiety*, *26*(3), 235-242. doi:10.1002/da.20542

Cunningham, M. J., Wuthrich, V. M., Rapee, R. M., Lyneham, H. J., Schniering, C. A., & Hudson, J. L. (2009). The Cool Teens CD-ROM for anxiety disorders in adolescents: A pilot case series. *European Child & Adolescent Psychiatry*, *18*(2), 125-129. doi:10.1007/s00787-008-0703-y

Cunningham, M., & Wuthrich, V. (2008). Examination of barriers to treatment and user preferences with computer-based therapy using the Cool Teens CD for adolescent anxiety. *E-Journal of Applied Psychology*, *4*(2), 12-17

.

Damschroder, L., Aron, D., Keith, R., Kirsh, S., Alexander, J., & Lowery, J. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science, 4,* 50.

Dillman, D.A., Smyth, J. D.. & Christian, L. M. (2009). *Internet, mail, and mixed-mode surveys: The Tailored Design Method* (3rd ed.) Hoboken, NJ: Wiley.

Dimeff, L. A., Koerner, K., Woodcock, E. A., Beadnell, B., Brown, M. Z., Skutch, J. M., & ... Harned, M. S. (2009). Which training method works best? A randomized controlled trial comparing three methods of training clinicians in dialectical behavior therapy skills. *Behaviour Research and Therapy*, *47*(11), 921-930. doi:10.1016/j.brat.2009.07.011

Funderburk, B. W., Ware, L. M., Altshuler, E., & Chaffin, M. (2008). Use and feasibility of telemedicine technology in the dissemination of parent-child interaction therapy. *Child Maltreatment*, *13*(4), 377-382. doi:10.1177/1077559508321483

Garland, A. F., Brookman-Frazee, L., Hurlburt, M. S., Accurso, E. C., Zoffness, R. J., Haine-Schlagel, R., & Ganger, W. (2010). Mental health care for children with disruptive behavior problems: A view inside therapists' offices. *Psychiatric Services*, *61*(8), 788-795. doi:10.1176/appi.ps.61.8.788

Glisson, C., & Schoenwald, S. K. (2005). The ARC organizational and community intervention strategy for implementing evidence-based children's mental health treatments. *Mental Health Services Research*, *7*(4), 243-259. doi:10.1007/s11020-005-7456-1

Grant, D. M., Malloy, A. D., & Murphy, M. C. (2009). A comparison of student perceptions of their computer skills to their actual abilities. *Journal of Information Technology Education, 8*(1), 141-160.

Griffiths, K. M., & Christensen, H. (2006). Review of randomised controlled trials of internet interventions for mental disorders and related conditions. *Clinical Psychologist*, *10*(1), 16-29. doi:10.1080/13284200500378696

Hawley, K. M., Cook, J. R., & Jensen-Doss, A. (2009). Do noncontingent incentives increase survey response rates among mental health providers? A randomized trial comparison. *Administration and Policy in Mental Health and Mental Health Services Research*, *36*(5), 343-348. doi:10.1007/s10488-009-0225-z

Heinssen, R. K., Glass, C. R., & Knight, L. A. (1987). Assessing computer anxiety: Development and validation of the Computer Anxiety Rating Scale. *Computers in Human Behavior*, *3*(1), 49-59. doi:10.1016/0747-5632(87)90010-0

Herschell, A. D., Kolko, D. J., Baumann, B. L., & Davis, A. C. (2010). The role of therapist training in the implementation of psychosocial treatments: A review and critique with recommendations. *Clinical Psychology Review*, *30*, 448-466. doi:10.1016/j.cpr.2010.02.005

Jensen-Doss, A., Hawley, K. M., Lopez, M., & Osterberg, L. (2009). Using evidence-based treatments: The experiences of youth providers working under a mandate. *Professional Psychology: Research and Practice*, *40*(4), 417-424. doi:10.1037/a0014690

Kenny, P., Rizzo, A. A., Parsons, T. D., Gratch, J., Leuski, A., & Swartout, W. (2007). A virtual human agent for training novice therapist clinical interviewing skills. *Annual Review of Cyber Therapy and Telemedicine*, *5*, 77-83. Retrieved from https://www.vrphobia.com /Research/Publications/ARCTT2007.pdf#page=77

Khanna, M. S., & Kendall, P. C. (2008). Computer-assisted CBT for child anxiety: The coping cat CD-ROM. *Cognitive and Behavioral Practice*, *15*(2), 159-165. doi:10.1016/j.cbpra.2008.02.002

Khanna, M. S., & Kendall, P. C. (2010). Computer-assisted cognitive behavioral therapy for child anxiety: Results of a randomized clinical trial. *Journal of Consulting and Clinical Psychology*, *78*(5), 737-745. doi:10.1037/a0019739

Kline, P. (1986). A handbook of test construction. London: Methuen.

Lochman, J. E., Boxmeyer, C., Powell, N., Qu, L., Wells, K., & Windle, M. (2009). Dissemination of the Coping Power program: Importance of intensity of counselor training. *Journal of Consulting and Clinical Psychology*, *77*(3), 397-409. doi:10.1037/a0014514

March, S., Spence, S. H., & Donovan, C. L. (2009). The efficacy of an Internet-based cognitive-behavioral therapy intervention for child anxiety disorders. *Journal of Pediatric Psychology*, *34*(5), 474-487. doi:10.1093/jpepsy/jsn099

Martino, S. (2010). Strategies for training counselors in evidence-based treatments. *Addiction Science & Clinical Practice,* 30-38. Retrieved from http://motivationalinterview.org/ Documents/Strategies.pdf

McCloskey, M. S. (2011). Training in empirically supported treatments using alternative learning modalities. *Clinical Psychology: Science and Practice*, *18*(1), 84-88. doi:10.1111/j.1468-2850.2011.01237.x

Muthén and Muthén, (2010)Muthén B. O., & Muthén L. K. (2010). Mplus (Version 6). Los Angeles, California.

Nelson, T. D., & Nelson, J. (2010). Evidence-based practice and the culture of adolescence. *Professional Psychology: Research and Practice*, *41*(4), 305-311. doi:10.1037/a0020328

Nelson, T. D., & Steele, R. G. (2007). Predictors of practitioner self-reported use of evidence-based practices: Practitioner training, clinical setting, and attitudes toward research. *Administration and Policy in Mental Health and Mental Health Services Research*, *34*(4), 319-330. doi:10.1007/s10488-006-0111-x

Newman, M. G., Szkodny, L. E., Llera, S. J., & Przeworski, A. (2011). A review of technology-assisted self-help and minimal contact therapies for anxiety and depression: Is human contact necessary for therapeutic efficacy?. *Clinical Psychology Review*, *31*(1), 89-103. doi:10.1016/j.cpr.2010.09.008

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

Parsons, T. D., & Rizzo, A. A. (2008). Affective outcomes of virtual reality exposure therapy for anxiety and specific phobias: A meta-analysis. *Journal of Behavior Therapy and Experimental Psychiatry*, *39*(3), 250-261. doi:10.1016/j.jbtep.2007.07.007

Proctor, E. K., Landsverk, J., Aarons, G., Chambers, D., Glisson, C., & Mittman, B. (2009). Implementation research in mental health services: An emerging science with conceptual, methodological, and training challenges. *Administration and Policy in Mental Health and Mental Health Services Research*, *36*(1), 24-34. doi:10.1007/s10488-008-0197-4

Rainie, L. (2010). Internet, broadband, and cell phone statistics. Pew Internet & American Life Project, January 5th, 2010. http://www.pewinternet.org/~ /media//Files/Reports/2010/PIP_ December09_update.pdf. 1-17.

The President's New Freedom Commission on Mental Health. (2003). *Achieving the Promise: Transforming Mental Health Care in America. Final Report* (DHHS Pub. No. SMA-03-3832). Rockville, MD: Author.

Schoenwald, S. K., Chapman, J. E., Kelleher, K., Hoagwood, K., Landsverk, J., Stevens, J., & ... Rolls-Reutz, J. (2008). A survey of the infrastructure for children's mental health services: Implications for the implementation of empirically supported treatments (ESTs). *Administration and Policy in Mental Health and Mental Health Services Research*, *35*(1-2), 84-97. doi:10.1007/s10488-007-0147-6

Sholomskas, D. E., & Carroll, K. M. (2006). One small step for manuals: Computer-assisted training in twelve-step facilitation. *Journal of Studies on Alcohol*, *67*(6), 939-945.

Sholomskas, D. E., Syracuse-Siewert, G., Rounsaville, B. J., Ball, S. A., Nuro, K. F., & Carroll, K. M. (2005). We don't train in vain: A dissemination trial of three strategies of training clinicians in cognitive-behavioral therapy. *Journal of Consulting and Clinical Psychology*, *73*(1), 106-115. doi:10.1037/0022-006X.73.1.106

Simon, G. E., & Ludman, E. J. (2010). Predictors of early dropout from psychotherapy for depression in community practice. *Psychiatric Services*, *61*(7), 684-689. doi:10.1176/appi.ps.61.7.684

Spek, V., Cuijpers, P., Nyklíček, I., Riper, H., Keyzer, J., & Pop, V. (2007). Internet-based cognitive behaviour therapy for symptoms of depression and anxiety: A meta-analysis. *Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences*, *37*(3), 319-328. doi:10.1017/S0033291706008944

Stallard, P., Richardson, T., & Velleman, S. (2010). Clinicians' attitudes towards the use of computerized cognitive behaviour therapy (cCBT) with children and adolescents. *Behavioural and Cognitive Psychotherapy*, *38*(5), 545-560. doi:10.1017/S1352465810000421

Stallard, P., Velleman, S., & Richardson, T. (2010). Computer use and attitudes towards computerised therapy amongst young people and parents attending child and adolescent mental health services. *Child and Adolescent Mental Health*, *15*(2), 80-84. doi:10.1111/j.1475-3588.2009.00540.x

van den Berg, S. S., Shapiro, D. A., Bickerstaffe, D. D., & Cavanagh, K. K. (2004). Computerized cognitive-behaviour therapy for anxiety and depression: A practical solution to the shortage of trained therapists. *Journal of Psychiatric and Mental Health Nursing*, *11*(5), 508-513. doi:10.1111/j.1365-2850.2004.00745.x

Vismara, L. A., Young, G. S., Stahmer, A. C., Griffith, E., & Rogers, S. J. (2009). Dissemination of evidence-based practice: Can we train therapists from a distance?. *Journal of Autism and Developmental Disorders*, *39*(12), 1636-1651. doi:10.1007/s10803-009-0796-2

Waller, R. R., & Gilbody, S. S. (2009). Barriers to the uptake of computerized cognitive behavioural therapy: A systematic review of the quantitative and qualitative evidence. *Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences*, *39*(5), 705-712. doi:10.1017/S0033291708004224

Weingardt, K. R. (2004). The role of instructional design and technology in the dissemination of empirically supported, manual-based therapies. *Clinical Psychology: Science and Practice*, *11*(3), 313-331. doi:10.1093/clipsy.bph087

Whitfield, G., & Williams, C. (2004). If the evidence is so good - Why doesn't anyone use them? A national survey of the use of computerized cognitive behaviour therapy. *Behavioural and Cognitive Psychotherapy*, *32*(1), 57-65. doi:10.1017/S1352465804001031

Wright, J. H., Wright, A. S., Albano, A., Basco, M. R., Goldsmith, L., Raffield, T., & Otto, M. W. (2005). Computer-assisted cognitive therapy for depression: Maintaining efficacy while reducing therapist time. *The American Journal of Psychiatry*, *162*(6), 1158-1164. doi:10.1176/appi.ajp.162.6.1

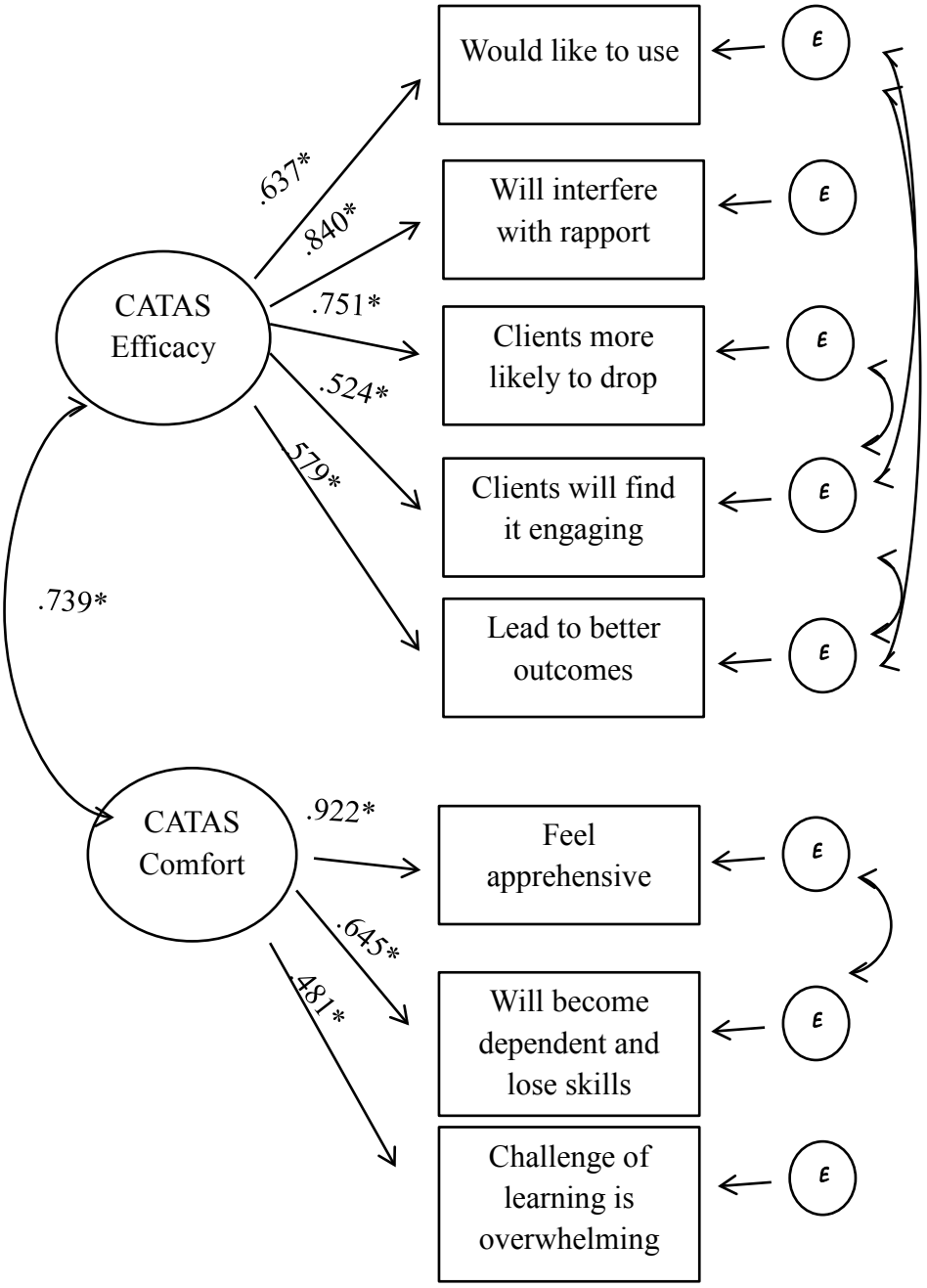

Figure 1. Two-factor measurement model for the Computer-Assisted Therapy Attitudes Scale with standardized loadings.
* $p < .001$.

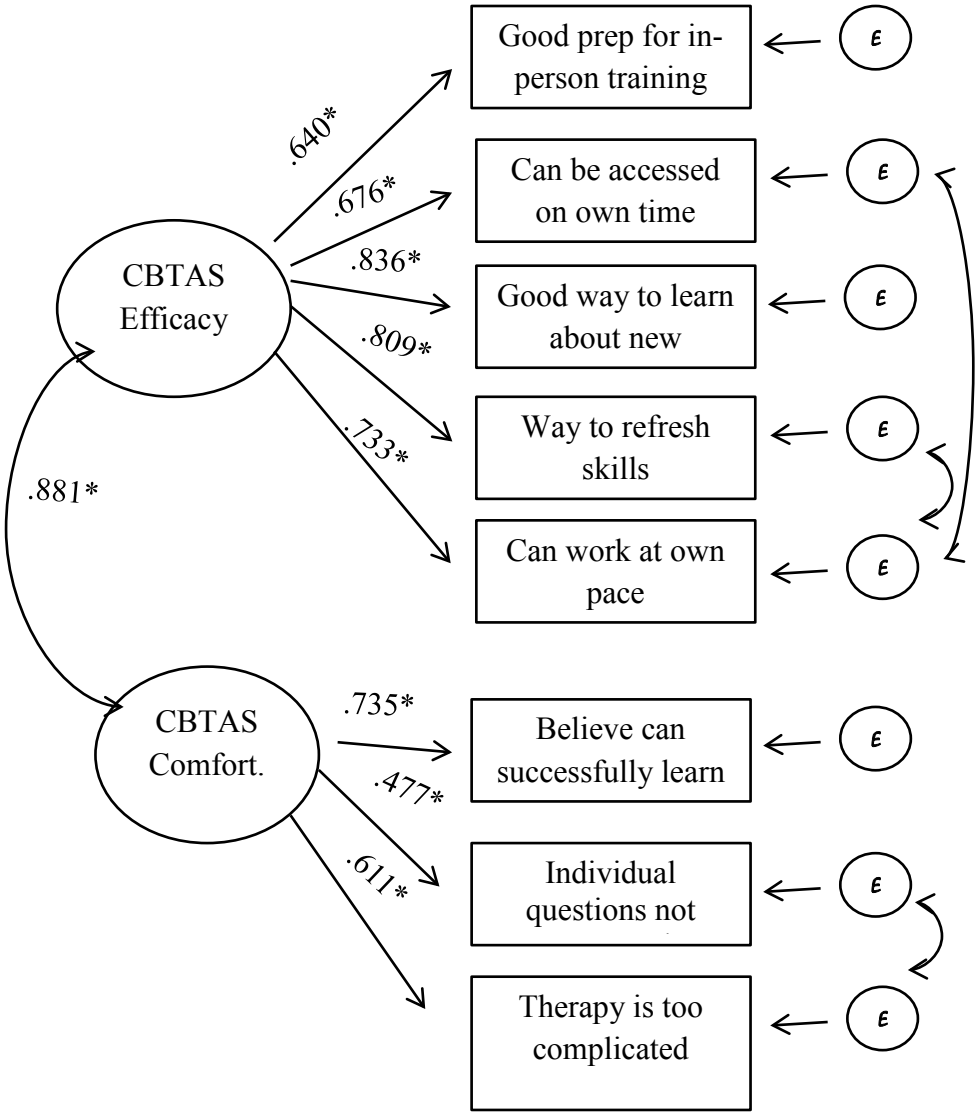

Figure 2. Two-factor measurement model for the Computer-Based Training Attitudes Scale with standardized loadings.
* $p < .001$.

Table 1

Demographic characteristics of sample.

	n (%)
Gender	
Male	104 (26.5%)
Female	282 (71.9%)
Ethnicity	
Caucasian	333 (84.9%)
African American	8 (2.0%)
Hispanic	11 (2.8%)
Asian	2 (0.5%)
Other	4 (1.0%)
Work Environment	
Private Practice	238 (60.7%)
Mental Health Agency	81 (20.7%)
School	31 (7.9%)
Hospital	14 (3.6%)
Other	26 (6.6%)
Theoretical Orientation	
CBT	208 (53.1%)
Psychodynamic/Psychoanalytic	42 (10.7%)
Family Systems	27 (6.9%)
Eclectic	145 (37.0%)
Other (e.g., Adlerian)	70 (17.9%)

Table 2

Items Removed from CATAS and CBTAS following CFA

	M	SD	Cohen's d
CATAS			
I am confident that I can learn the skills to use computer assisted therapy[a]	3.95***	0.92	1.03
My clients aren't computer savvy enough to use computers in therapy	2.49***	0.91	.56
I have sufficient access to computers to use them in sessions	3.63***	1.12	.56
CBTAS			
I would participate in a computer-based training program during work hours	3.39***	1.14	.34
I would participate in a computer-based training program on my own time	3.44***	1.06	.42
I do not have the computer abilities to navigate through a computer-based training program	1.96***	0.92	1.13
I don't have sufficient access to computers to use a computer-based training	1.71***	0.79	1.63

Note. Item mean scores range from 0 to 5 (Strongly Disagree to Strongly Agree), with scores of 3 indicating neutral attitudes. [a] Original item means are presented; negatively worded items were reverse scored for scale computations. ***Score significantly different from 3 ($p < .001$).

Table 3

Raw Means, standard deviations, and Cronbach's alpha for measures completed by participants

Measure	*M*	SD	α
CATAS	25.27*	5.71	.85
CBTAS	27.95*	5.20	.87
CFS	27.82	4.07	.80
EBPAS Openness	10.58	3.10	.88
CATAS Apprehension	10.43	2.5	.66
CATAS Efficacy	14.84	3.95	.85
CBTAS Apprehension	9.63	2.23	.68
CBTAS Efficacy	18.37	3.39	.87

Note. * $p < .001$. when compared to the neutral scale value (average item scores of 24 on the CATAS and CBTAS Totals)

Table 4

Pearson correlation coefficients for CATAS, CBTAS, and Age

		1	2	3	4	5	6	7
1	CATAS	-						
2	CBTAS	.52**	-					
3	Age	-.08	-.11*	-				
4	CATAS Comfort	.81**	.31**	-.04	-			
5	CATAS Efficacy	.93**	.55**	-.10	.54**	-		
6	CBTAS Comfort	.49**	.85**	-.10**	.29**	.52**	-	
7	CBTAS Efficacy	.46**	.94**	-.09	.28**	.49**	.62**	-

Note. *p < .05, **p < .01

Table 5

Therapist-reported access to technology resources for all participants and by work environment

Resource		Work Environment		
	Total Sample (N=392)	Comm. Agency (n = 81)	Private Practice (n = 235)	School/ University (n = 31)
Technology Support Staff	158 (40.3%)	56 (69.1%)	47 (19.7%)	24 (77.4%)
Any Computer	356 (90.8%)	76 (93.8%)	213 (89.5%)	29 (93.5%)
Desktop Computers	265 (68.3%)	70 (86.4%)	135 (56.7%)	27 (87.1%)
Laptop Computers	230 (58.5%)	44 (54.3%)	150 (63.0%)	17 (54.8%)
Tablet Computers	58 (14.6%)	11 (13.6%)	43 (18.1%)	4 (13.8%)
Netbook computers	26 (6.6%)	6 (7.4%)	14 (5.9%)	4 (12.9%)
High Speed Internet	319 (81.2%)	65 (80.2%)	193 (81.1%)	28 (90.3%)
Computer Microphones	100 (25.4%)	23 (28.4%)	60 (25.2%)	10 (32.3%)
Word Processing	255 (64.9%)	59 (72.8%)	142 (59.7%)	26 (83.9%)
Digital Media	163 (41.5%)	43 (53.1%)	86 (36.1%)	18 (58.1%)
Webcams	106 (27.0%)	26 (32.1%)	60 (25.2%)	10 (32.3%)
Audio Recorders	86 (21.9%)	19 (23.5%)	52 (21.8%)	9 (29.0%)
DVD Players	197 (50.1%)	44 (54.3%)	111 (46.6%)	21 (67.7%)
Video conferencing Equipment	70 (17.8%)	27 (33.3%)	18 (7.6%)	8 (25.8%)
Computer Speakers	171 (43.5%)	48 (59.3%)	86 (36.1%)	18 (58.1%)

Video Recorders	70 (17.8%)	23 (28.4%)	32 (13.4%)	7 (22.6%)
Virtual Reality Equipment	2 (0.5%)	0 (0.0%)	1 (0.4%)	0 (0.0%)
Reported Satisfaction with Technology	294 (75.0%)	56 (69.1%)	184 (77.3%)	25 (80.6%)
Mean Ease of Access Ratings	4.40 (*SD* = 1.15)	4.60 (*SD* = .85)	4.30 (*SD* = 1.27)	4.50 (*SD* = .82)

Table 6

CATAS item means, standard deviations, Cohen's d, and factor loadings

CATAS item	*M*	SD	Cohen's d	Factor Loading
CATAS Comfort				
I feel apprehensive about using computers during therapy[a]	3.14*	1.21	.12	.922
I am afraid that if I begin to use computers in therapy I will become dependent upon them and lose some of my own skills	2.14***	1.00	.86	.645
The challenge of learning about computers in therapy seems overwhelming to me	2.28***	1.03	.70	.481
CATAS Efficacy				
If given the opportunity and training, I would like to use computers in therapy	3.15*	1.15	.13	.637
Using computers in therapy will interfere with rapport	3.31***	1.12	.28	.840
My clients will be more likely to drop out of treatment if I use a computer program as a part of therapy	2.88*	0.99	.12	.751
My clients would find it engaging to learn new skills using a computer	3.13**	0.84	.15	.524
I believe that using computer programs in therapy	2.78***	0.86	.26	.579

will lead to better outcomes for my clients

Note. Item mean scores range from 0 to 5 (Strongly Disagree to Strongly Agree), with scores of 3 indicating neutral attitudes. [a] Original item means are presented; negatively worded items were reverse scored for scale computations. *Score significantly different from 3 ($p < .05$); **Score significantly different from 3 ($p < .01$); ***Score significantly different from 3 ($p < .001$).

Table 7

CBTAS item means, standard deviations, Cohen's d, and factor loadings

CBTAS item	*M*	SD	Cohen's d	Factor Loading
CBTAS Comfort				
I can successfully learn new treatment programs through a computer-based program[a]	3.69***	0.82	.84	.735
My individual questions will not be answered through a computer-based training program	3.01	0.91	.01	.477
Therapy is too complicated to be taught through a computer-based training program	3.00	1.05	.00	.611
CBTAS Efficacy				
A computer-based training program would be good preparation for attending an in-person training workshop	3.49***	0.92	.53	.640
Computer-based training programs are good because they can be accessed on my own time	3.84***	0.79	1.06	.676
Computer-based training programs are a good way to learn about new treatments	3.55***	0.81	.68	.836
A computer-based training would be a good way to refresh my skills	3.65***	0.86	.76	.809
Computer-based training programs are good because I can work at my own pace.	3.86***	0.75	1.15	.733

Note. Item mean scores range from 0 to 5 (Strongly Disagree to Strongly Agree), with scores of 3 indicating neutral attitudes. [a] Original item means are presented; negatively worded items were reverse scored for scale computations. ***Score significantly different from 3 ($p < .001$).

Table 8

Predictors of CATAS and CBTAS Total Scores

	CATAS Total			CBTAS Total		
	Univariate		Multivariate (R^2 = .21)	Univariate		Multivariate (R^2 = .33)
Predictor Variable	β	R^2	B	β	R^2	β
Age	-.08	.007	.071	-.11*	.01	.105
Gender	.06	.003	.062	.008	.000	.054
CFS score	.29***	.09	.203**	.37***	.13	.310***
EBPAS Openness	.34***	.12	.230***	.44***	.20	.354***
Satisfied with Tech	-.08	.006	-.039	-.09	.007	-.047
CBT	.12*	.015	.013	.15**	.022	.116*
Psychodynamic	-.10	.010	-.04	-.16**	.025	-.084
Eclectic	-.13*	.017	-.109	-.008	.000	.028
School/University	.10	.010	.124	.001	.000	.014
Comm. Agency	.11*	.012	.102	.04	.002	.023
Private Practice	-.16**	.026	.026	-.07	.005	.088
Years Experience	-.17**	.028	-.084	-.19***	.036	-.116
Tech Access	.12*	.015	.069	.12*	.015	.057
Works with Adults	-.07	.004	-.023	-.02	.004	.043
Works with Both Adults and Kids	.02	.004	.026	.07	.004	-.008

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 9

Predictors of CATAS Subscales

	CATAS Efficacy			CATAS Comfort		
	Univariate		Multivariate (R^2 = .20)	Univariate		Multivariate (R^2 = .20)
Predictor Variable	β	R^2	β	β	R^2	β
Age	-.10	.009	.050	-.04	.001	.079
Gender	.06	.004	.104	.03	.001	-.025
CFS score	.18***	.03	.053	.39***	.15	.371***
EBPAS Openness	.34***	.11	.240***	.24***	.06	.138*
Satisfied with Tech	-.11*	.01	-.075	-.002	.000	.031
CBT	.17**	.03	.073	.01	.000	-.085
Psychodynamic	-.12*	.013	-.042	-.04	.002	-.024
Eclectic	-.11*	.013	-.092	-.11*	.013	-.098
School/University	.11*	.012	.132	.06	.003	.070
Comm. Agency	.12*	.01	.096	.06	.004	.077
Private Practice	-.17**	.03	.017	-.09	.008	.031
Years Experience	-.18***	.032	-.119	-.10	.009	-.001
Tech Access	.11*	.012	.088	.11*	.012	.016
Works with adults	.-.09	.008	-.051	-.01	.001	.028
Works with both adults and kids	.05	.008	.041	-.03	.001	-.005

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 10

Predictors of CBTAS Subscales

	CBTAS Efficacy			CBTAS Comfort		
	Univariate		Multivariate (R^2 = .32)	Univariate		Multivariate (R^2 = .22)
Predictor Variable	β	R^2	β	β	R^2	β
Age	-.09	.009	.109	-.10	.01	.075
Gender	-.003	.000	.066	.008	.000	.023
CFS score	.36***	.13	.299***	.31***	.09	.254***
EBPAS Openness	.45***	.20	.348***	.36***	.13	.280***
Satisfied with Tech	-.07	.005	-.047	-.08	.006	-.037
CBT	.15**	.02	.097	.14**	.02	.117*
Psychodynamic	-.19***	.037	-.099	-.083	.007	-.043
Eclectic	-.03	.001	.002	.007	.000	.059
School/University	-.01	.000	-.023	.01	.000	.065
Comm. Agency	.05	.002	-.049	.07	.005	.124
Private Practice	-.06	.003	.014	-.06	.004	.177*
Years Experience	-.20***	.039	-.117	-.16**	.026	-.087
Tech Access	.11*	.012	.051	.13*	.017	.054
Works with adults	.002	.000	.060	-.04	.008	.007
Works with both adults and kids	.016	.000	-.013	.09	.008	.002

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Appendix A

The Therapist Computer Access and Attitudes Survey

eProst ID: 20110468
Approved

Approval Date: 7/26/2011

UNIVERSITY OF MIAMI
DEPARTMENT of PSYCHOLOGY

The Therapist Computer Access and Attitudes Survey

Today's Date: / /	**Gender:** Male Female
Age: _____	**Ethnicity:** _____
Primary work setting: (e.g., community agency, hospital) _____	**Degrees and credentials earned:** (Check all that apply) _____ MA/MS _____ MSW _____ LPC _____ LSSP _____ PsyD _____ PhD _____ RN _____ MD _____ EdD _____ LCSW _____ MFCC/MFT _____ Other (please explain) _____
State licensed? Yes_____ No_____	

A computer-assisted therapy program is an online or CD-ROM program designed to help in the delivery of therapeutic interventions, both in session and as a tool for clients to use outside of therapy.

Have you ever seen a **computer-assisted therapy program**? Yes_____ No_____

Have you ever used a **computer-assisted therapy program**? Yes_____ No_____

If yes to either, please describe_____

The following statements describe ways people might feel towards using computer-assisted therapy programs. Please rate how much you agree with the following statements by circling the answer that best describes your opinion.

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
1. If given the opportunity and training, I would like to use computers in therapy	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --
2. I feel apprehensive about using computers during therapy	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --
3. I am afraid that if I begin to use computers in therapy I will become dependent upon them and lose some of my own skills	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --
4. Using computers in therapy will interfere with rapport	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --
5. My clients will be more likely to drop out of treatment if I use a computer program as a part of therapy	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --
6. My clients would find it engaging to learn new skills using a computer	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --
7. I believe that using computer programs in therapy will lead to better outcomes for my clients	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --
8. The challenge of learning about the use of computers in therapy seems overwhelming to me	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --
9. I am confident that I can learn the skills to use computer assisted therapy	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --
10. My clients aren't computer savvy enough to use computers in therapy	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --
11. I have sufficient access to computers to use them in sessions	-- 1 --	-- 2 --	-- 3 --	-- 4 --	-- 5 --

The Therapist Computer Access and Attitudes Survey

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UNIVERSITY
OF MIAMI
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Please answer the following questions about <u>your computer usage</u>:

How long have you been using computers (including using email, word processing, etc.)?

_____ Less than 6 months _____ 6 to 12 months _____ 1 to 3 years

_____ 4 to 6 years _____ 7 years or more

Approximately how many computer classes or seminars have **you** attended throughout your lifetime? _____

How frequently do you access a computer **at home**?	Multiple times per day	Daily	Weekly	Monthly	< Once a month	Never
How frequently do you access a computer **at work**?	Multiple times per day	Daily	Weekly	Monthly	< Once a month	Never

If you access a computer at work, what do you primarily use it for (Check all that apply)?

_____ Checking Email
_____ Administering Assessments
_____ Writing Case Notes or other Record Keeping
_____ E-mailing clients
_____ Assessment Scoring
_____ Appointment Scheduling
_____ Client engagement (e.g., letting client play a computer game as a rapport building exercise)
_____ OTHER (please describe) _____

Do you have a technical support staff in your workplace? Yes_____ No_____

Approximately how many years has it been since your technological equipment was last updated? _____

Are you satisfied with the quality of the technological equipment in your workplace? Yes_____ No_____

The following statements describe ways people might feel towards computers. Please rate how much you agree with the following statements by circling the answer that best describes your opinion.

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
1. In general, I am comfortable using computers	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
2. I am comfortable using the Internet	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
3. I tend to avoid computers because they are unfamiliar and somewhat intimidating to me	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
4. I have difficulty in understanding the technical aspects of computers in general	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
5. Anyone can learn to use a computer if they are patient and motivated	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
6. Learning to operate computers is like learning any new skill--the more you practice, the better you become	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
7. I feel that I am able to keep up with the advances happening in the computer field	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –

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A computer-based training program is an online or CD-ROM program designed to teach clinicians new therapies through an interactive media format.

Have you ever participated in a **computer-based training program** to learn new therapeutic techniques? Yes_____ No_____

If yes, please describe_____

The following statements describe ways people might feel towards using computer-based training programs. Please rate how much you agree with the following statements by circling the answer that best describes your opinion.

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
1. I would participate in a computer-based training program during work hours	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
2. I can successfully learn new treatment programs through a computer-based training program	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
3. I am not confident in my ability to successfully navigate through a computer-based training program	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
4. I would participate in a computer-based training program on my own time	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
5. A computer-based training program would be good preparation for attending an in-person training workshop	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
6. My individual questions will not be answered through a computer-based training program	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
7. Computer-based training programs are good because they can be accessed on my own time	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
8. I do not have the computer abilities to navigate through a computer-based training program	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
9. Computer-based training programs are a good way to learn about new treatments	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
10. Therapy is too complicated to be taught through a computer-based training program	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
11. A computer-based training would be a good way to refresh my skills	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
12. Computer-based training programs are good because I can work at my own pace	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –
13. I don't have sufficient access to computers to use a computer-based training	-- 1 –	-- 2 –	-- 3 –	-- 4 –	-- 5 –

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We are also interested in knowing a bit about your workplace and the kind of work you do. Please answer the following questions about <u>your workplace</u> to the best of your abilities:

Approximately how many clinicians are on staff? _____

Approximately how many computers are accessible to clinicians? _____

How many years of full-time professional/clinical experience have you had? _____

What is your primary theoretical orientation? _____

Approximately how many active cases do you carry at once? _____

Do you use manualized treatments as a part of your practice? Often_____ Sometimes _____ Never_____

Please indicate what technological equipment is present in **<u>your workplace location</u>** (Check all that apply):

_____ Desktop Computers	_____ Laptop Computers	_____ Netbook Computers
_____ Tablet Computers (e.g., iPad)	_____ Digital Media software (e.g., Windows Media Player)	_____ Videoconferencing equipment
_____ Word processing software	_____ Webcams	_____ Computer Speakers
_____ High Speed Internet	_____ Audio Recorders	_____ Video Recorders
_____ Computer microphones	_____ DVD Player	_____ Virtual Reality Equipment
_____ OTHER (please describe) _____		

On a scale of one (*no access at all*) to five (*easy access*), how easy is your access to computers **at work:**	No Access		Some Access		Easy Access
	--1--	--2--	--3--	--4--	--5--

Please indicate whether the following are a **Major Part** of your work, a **Minor Part** of your work, or **Not at All** a part of your work by checking the appropriate column:

	Major Part	Minor Part	Not at All		Major Part	Minor Part	Not at All
Children 3-6 years	_____	_____	_____	Adults 18-30 years	_____	_____	_____
Children 7-10 years	_____	_____	_____	Adults 31-64 years	_____	_____	_____
Youth 11-17 years	_____	_____	_____	Adults 65 years or older	_____	_____	_____
Administer or interpret assessment measures	_____	_____	_____	Attend/provide supervision or peer consultation	_____	_____	_____
Conduct therapy (e.g., play therapy)	_____	_____	_____	Read professional literature	_____	_____	_____
Case preparation, management and paperwork	_____	_____	_____	Attend professional trainings or seminars	_____	_____	_____

Please indicate the extent to which you agree with the following statements:

	Not at All		Somewhat		Very Much
1. I like to use new types of therapy/interventions to help my clients	--0--	--1--	--2--	--3--	--4--
2. I am willing to try new types of therapy/interventions even if I have to follow a treatment manual	--0--	--1--	--2--	--3--	--4--
3. I am willing to use new and different types of therapy/interventions developed by researchers	--0--	--1--	--2--	--3--	--4--
4. I would try a new therapy/intervention even if it were very different from what I am used to doing	--0--	--1--	--2--	--3--	--4--