

Using Everyday Technology to Enhance Evidence-Based Treatments

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Technologies such as smartphones and digital cameras are an increasingly ubiquitous part of modern life, and the increasing convenience of these electronic tools provides psychotherapists with opportunities to incorporate these technologies into psychotherapy. In the face of so much opportunity, psychotherapists must learn how to incorporate these tools effectively and responsibly. The authors present three case studies that demonstrate the use of digital technology to individualize and enhance the efficiency of existing evidence-based treatments. In the first, digital pictures were used to track the treatment progress of a client who compulsively hoards. In the second, a smartphone was used to record a personalized progressive muscle relaxation file for a client with agoraphobia, hypochondriasis, and generalized anxiety disorder. In the third, a smartphone was used to photograph and send pictures of in-session work to a client with trichotillomania and generalized anxiety disorder. The implications and ethical considerations of using technology in psychotherapeutic settings are explored, and practical strategies are provided for incorporating common digital technology into psychotherapeutic practice.

Keywords: smartphone, anxiety, technology, evidence-based treatment

New technology has frequently been implemented as an adjunct to cognitive-behavioral psychotherapy, from early computer-assisted systematic desensitization (Lang, Melamed, & Hart, 1970) to the recent virtual/augmented reality-assisted exposure treatment (Botella, Bretón-López, Quero, Baños, & García-Palacios, 2010). While technology has influenced and expanded the practice of psychology in some cases, such as with telehealth and virtual reality applications, technology has not revolutionized the field in the way it has with some other domains in health care, such as radiology, surgery, or dentistry. This may be in part because new

technology is, at least initially, often too expensive for private psychotherapists or community-based clinics, where most psychotherapy services are provided (Boschen & Casey, 2008).

There are at least two ways in which technology can significantly influence current practice in a field. First, cutting-edge technology provides such a leap forward in knowledge, methods, and capability that it revolutionizes practice in the way that scanning technologies have changed neurology, to use an example from another field. Revolution can also occur when a technology becomes ubiquitous and integrates itself into the cultural and social

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fabric. As noted by Internet technology commentator Shirky (2008), "It's when a technology becomes normal, then ubiquitous, and finally so pervasive as to be invisible, that the really profound changes happen" (p. 105).

A recent technology that is becoming pervasive is the smartphone. The smartphone is superseding the cellular phone, and smartphones are carried by over 80% of U.S. adults, up from two thirds just six years earlier (Lenhart, 2010). Despite their relatively recent ubiquity, cell phones have already generated several psychotherapeutic applications. In a recent review of 16 studies involving cell phones, Boschen (2009b) noted that one of the leading uses of cell phone technology as an adjunct to psychotherapy occurs in research involving smoking cessation. Thus far, it is difficult to assert that cell phones, when used as an adjunct to more traditional psychotherapeutic interventions, actually improve outcomes, as few studies have included control groups (Boschen, 2009b). However, Clough and Casey (2011a) reviewed 14 studies involving the use of telephone reminders to improve attendance at clinical appointments. In 11 of these studies, positive effects were found for these reminder calls, especially for increasing attendance at initial sessions. Cell phones have also been used as a tool in increasing physical activity (Fukuoka, Vittinghoff, Jong, & Haskell, 2010), maintaining regular communication with clients from groups at risk for dropping out of treatment (Bigelow, Carta, & Lefever, 2008), and playing media to extend the benefits of stress- and anxiety-reduction strategies such as relaxation and exposure (Gorini et al., 2010). Boschen and Casey (2008) provided an overview of potential applications of cell phones to cognitive-behavioral psychotherapy, explaining that the use of cell phones can be used to make treatment more efficient, or to increase the "dose" of treatment that clients receive.

Like the cell phone, the smartphone is an unobtrusive device that can be used without stigma. People who own a smartphone or cell phone tend to have the device with them at all times (Boschen & Casey, 2008). Smartphones offer many features—beyond the voice and text capability of the cell phone—in one streamlined package, eliminating the need for separate devices. For these reasons (among others), use of the smartphone has accelerated in the last few years, especially among health care providers (Dolan, 2010). It is thought that the centralization of many applications on one device may lead to increased client homework compliance (Clough & Casey, 2011b). Additionally, giving clients the ability to complete homework assignments on smartphones whenever they choose may make assignments like diaries, self-ratings, and logs more ecologically valid. Finally, clients' personal relationship with their smartphones may lead to greater engagement in psychotherapy and assessment assignments (Clough & Casey, 2011a).

Some initial uses of ubiquitous technologies such as smartphones, digital cameras, personal data assistants (PDA), and tablets have been reported by the medical community: assessing patients remotely via videophone (Josephson & Salman, 2010), monitoring activity level of patients with chronic diseases via accelerometer and global positioning technology (Zheng et al., 2010), compensating for memory loss in patients with anterograde amnesia via task and appointment reminders and photo display (Svoboda & Richards, 2009), and improving self-management of bipolar disorder and schizophrenia via PDAs, text messages, and telephone calls (Depp et al., 2010). Unsurprisingly, the area in which psychologists have most fully embraced cell phone and

smartphone technology is behavioral medicine (e.g., McClellan et al., 2009), with its close ties to the medical profession. For example, interventions for smoking cessation are among the most likely to incorporate phones as an adjunct to treatment.

Although mental health psychotherapists could conceivably adapt these smartphone technologies for similar purposes, the literature on use of these devices in psychotherapy is sparse. An older survey (Rosen & Weil, 1996) found that only one in four psychologists was using technology specifically designed for the psychology field and that over half of respondents self-reported some degree of "technophobia." Clinicians were more likely to be accepting of newer technologies if they had conducted assessments, if they were younger, or if higher percentages of their client base consisted of managed care clients (Rosen & Weil, 1996). A more recent survey (McMinn, Barse, Heyne, Smithberger, & Erb, 2011) of professional psychologists found a relatively low rate of newer technology use and relatively high uncertainty regarding the ethics of using various new technologies in practice. McMinn et al. (2001) suggested that further clarification and training would help alleviate some of this uncertainty, particularly as it pertains to technologies with which mental health professionals are less familiar.

Castelnuovo, Gaggioli, Mantovani, and Riva (2003) suggest that psychology has not been as quick as medicine to integrate technology due to the prized nature of the traditional one-on-one psychotherapist–client interaction. Further, different psychological orientations vary in their openness to incorporating new technology into practice, making consensus difficult when it comes to revising ethical codes (Clough & Casey, 2011b). Finally, there has been a lack of rigor in research studies of new technology in psychology (Boschen, 2009b; Clough & Casey, 2011a). Given the traditional value the field of psychology has placed on methodological rigor, the lack of rigorous research studies may be delaying the incorporation of these new technologies into training and practice (Clough & Casey, 2011b).

This article addresses the gap in the psychological literature on technology in psychotherapy by using case studies to describe in-session psychotherapeutic and assessment applications of some common technological devices, such as digital cameras and smartphones to enhance and facilitate treatment progress. Indeed, some of the more common functions of the smartphone (e.g., its ability to function as a camera or a camcorder) have not yet been fully appreciated in the psychotherapy literature, and this article describes how these functions can be used effectively in treatment to aid progress. While digital still and video cameras have been relatively inexpensive and available for many years, it is only with the advent of the smartphone that many practicing psychotherapists (and many of their clients) carry these capabilities with them every day. It is this availability that led to the case studies described here.

Case Studies

The case studies that follow draw from the work of three psychotherapists who incorporated relatively new, yet ubiquitous, technology into their psychotherapy sessions to improve and personalize client treatment. In the first case, pictures taken with a digital camera were used to track treatment progress and provide motivational feedback for a client suffering from compulsive

hoarding. In the next case, the psychotherapist used modern recording technology to personalize a relaxation script and e-mail it to a client suffering from upsetting, anxiety-related physiological symptoms. In the third case, the psychotherapist used her smartphone to capture and e-mail pictures of the in-session whiteboard to a client with generalized anxiety disorder and trichotillomania as a personalized reminder of the cognitive restructuring skills taught in-session. These case studies were not specifically designed to assess whether or not the use of technology produced a superior outcome to what would have been achieved without the incorporation of technology; rather, they provide an initial description of novel uses of technology in a community mental health clinic. In all three cases, the psychotherapists used the technology that they (and their clients) had at their disposal in conjunction with traditional cognitive-behavioral psychotherapy techniques to enhance client care. All three cases are drawn from a clinic in the mid-Atlantic region that specializes in treating children, adolescents, and adults who suffer from anxiety-related disorders, with an emphasis on the use of evidence-based treatments.

Case 1: Using Digital Photos To Track Psychotherapeutic Progress

A 60-year-old female client sought services to address issues related to compulsive hoarding. At intake, the client was living with her cats in a first-floor apartment. Her apartment was filled to the point where the entire floor was covered with assorted items. Clothing, books, magazines, cardboard boxes, papers, art supplies, and natural objects (rocks, bird's nests, etc.) were stacked throughout the apartment, in some places to the ceiling. The client reported that her last remaining functional space was her bed. The client's hoarding was severe enough that it interfered with her life and everyday functioning in a number of ways. For example, the clutter and lack of space in the client's apartment made it difficult for her to perform routine tasks, such as taking medications to manage her chronic illness, preparing food, and engaging in enjoyable hobbies. She described frequent "avalanches," where piles of items would topple over. She also expressed hesitancy to invite people to her apartment due to embarrassment, and as a result, she experienced significant social isolation. The client and psychotherapist met weekly in the client's apartment and agreed on three treatment goals: 1) increase the client's discarding of items; 2) decrease the client's acquisition of items; and 3) decrease the clutter in the client's living space.

The client's symptoms of depression were monitored using the Patient Health Questionnaire—9 (PHQ-9; Spitzer, Kroenke, & Williams, 1999), and the Saving Inventory—Revised (SI-R; Frost, Steketee, & Grisham, 2004) was used to track her compulsive hoarding symptoms. In addition, the Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Goodman et al., 1989) was used to track the presence of intrusive thoughts and behaviors since compulsive hoarding is sometimes conceptualized as being a form of obsessive-compulsive disorder (Frost & Steketee, 2010). These paper and pencil assessments of subjective symptoms were supplemented by digital photographs of the client's living space in order to create an objective record of the client's progress toward her goal of decreasing the clutter. Given the frequently changing "landscape" resulting from avalanches and the client's tendency to shuffle her belongings, digital photographs allowed the psycho-

therapist to assess treatment gains over time without having to rely on subjective measures such as memory, psychotherapist observation, or client report.

The entryway, living area, kitchen, bedroom, and studio were targets of intervention that were mutually agreed upon since these areas were most important for the client's health, safety, and quality-of-life. The psychotherapist photographed these areas regularly, from the same angle each time, and the photographs were grouped together by area of the room and arranged in chronological order. The client was never photographed by the psychotherapist. The photographs were taken with a digital camera, which was transported directly to the clinic after each session. At the clinic, the digital photographs were uploaded to a secure server, where they were stored in a password-protected file. On the secure server, the psychotherapist grouped the photographs by specific areas of the apartment to create a chronological slideshow using PowerPoint. Prior to visiting the client each week, the psychotherapist uploaded the updated PowerPoint presentation to a secure clinic laptop so that the client could view the slideshow. This process facilitated assessment of progress over the course of treatment and served as a salient feedback tool for the client.

At the time of the intake session, the client reported becoming fatigued very easily and finding it difficult to clean her space without becoming overwhelmed. She reported that it was usually easier for her to stay in bed and sleep than to get up to eat, take medication, clean her space, and complete other tasks of daily living. Over the course of treatment, the client would, at times, express frustration that she had not made much progress, or that she had not noticed major changes over time. However, visual evidence of the reduced clutter (e.g., slideshows made from the digital photographs taken over the course of treatment) helped the client to remember her progress and facilitated effective communication about specific treatment goals and milestones. Thus, in addition to serving as an assessment tool, the pictures served as a motivational reminder of treatment gains to the client.

Incorporating digital pictures into treatment required minimal time and effort on the part of the psychotherapist. However, the effect that these pictures had on the client and her progress was considerable. Though treatment is ongoing, the client no longer reaches clinical levels for depression on the PHQ-9, and her scores have decreased on the SI-R and Y-BOCS, as well.

Case 2: Using Digital Technology To Personalize Relaxation Exercises

A 21-year-old female client sought treatment because of panic attacks, generalized worry, and health care-seeking behaviors due to health-related worries. The client consistently misinterpreted her physiological cues to mean that there was something wrong with her body (e.g., cancer). She experienced frequent panic attacks as a result of these worries and went to the doctor frequently to assess new symptoms, despite having been given clean bills of health in the past by other doctors. She avoided leaving her home or going anywhere without her medication due to her health-related fears. In addition, the client experienced significant worry about a range of topics, and described her mind as a "demon roaring." She was afraid to stop worrying because that is when the "demon roared the loudest" (i.e., when she confronted her anxiety).

The client was treated primarily via clinic sessions, using a combination of cognitive and behavioral techniques. The client's panic attacks and physiological symptoms were treated using interoceptive and *in vivo* exposures. However, exposures were initially ineffective, as the client appeared to use worry as a mode of distraction during exposure; she focused on worrying about her health and other topics to avoid "hearing the demon roar" and she did not habituate to her anxiety. Thus, relaxation and cognitive coping techniques were the other important facets of the client's treatment.

Initial relaxation techniques (e.g., diaphragmatic breathing) were difficult for the client, as she stated that they only made her more aware of the things that could be going wrong in her body. The psychotherapist used a recording program on her smartphone to tailor a progressive muscle relaxation (PMR) recording for the client in session. This personalized recording used a relaxation script from an evidence-based treatment program (Craske & Barlow, 2006) as a basis and incorporated guided imagery relevant to a situation that the client found relaxing. It also incorporated coping thoughts related to the client's specific worries about her physiological cues and her fears of hearing the "demon roaring." The client reported that this recording, made during a session and then e-mailed to her for use at home as an MP3 file, made the relaxation exercises more accessible. After practicing her relaxation script at home using an MP3 player, the client reported that she had reduced her avoidance of her own anxiety symptoms. Integrating coping thoughts related to health also helped her to avoid worrying about her health while noticing subtle changes to her body during relaxation. As she became more practiced at using these coping thoughts in relaxation, she began using them more at other times, as well. Exposures became more effective, allowing the client to habituate to her anxiety.

Outcomes for Case 2 were tracked during treatment using both empirically validated psychometrically sound measures and idiographic assessment instruments (e.g., percentage of the day spent worrying). The Beck Anxiety Inventory (Beck, 1993), Beck Depression Inventory—II (Beck, 1996), Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990), and Anxiety Sensitivity Index—Revised (Deacon, Abramowitz, Woods, & Tolin, 2003) were all administered prior to treatment and throughout treatment. The client's scores on all these measures decreased over the course of treatment, and she reported a decrease in percentage of the day spent worrying.

In this second case, the psychotherapist used technology to improve the fit of the commonly used technique of a relaxation exercise for the client. The technology required to accomplish this was simple: The psychotherapist used a recording program on a smartphone to record an MP3 file and e-mailed the file to her client from her smartphone. Alternatively, if the client had not had access to an MP3 player, the psychotherapist could have copied the MP3 file to a CD for the client.

Case 3: Using a Smartphone To Facilitate the Generalization of Skills

A 19-year-old female college student sought services to address overwhelming worry and eyelash pulling. She reported excessive worry about several situations; however, the worries she found most distressing centered on her own health and safety and the safety of her boyfriend. In addition to her worry, she had been

pulling out her eyelashes while studying for exams; she reported that this behavior occurred largely outside of her awareness. She had been unsuccessful in her attempts to stop this behavior and was embarrassed by the resultant visible alopecia. Despite the considerable embarrassment caused by her hair pulling, she identified her uncontrollable worry as her most troubling problem and the primary focus of psychotherapy. Her very high and clinically significant score on the PSWQ, an empirically validated measure of worry, was consistent with her report of distress.

The client and psychotherapist agreed on three treatment goals: (a) reduce the number, frequency, and intensity of her worries; (b) reduce worry-related sleep disturbance; and (c) increase confidence in her ability to cope with anxiety. Early treatment focused on psychoeducation about anxiety; monitoring anxious thoughts, feelings, and behaviors; and learning ways to reduce physical tension. Although the client was able to identify anxious thoughts (i.e., "I cannot reach my boyfriend on his cell phone because he has been killed in a car accident on the way home from class") and associated physiological and emotional symptoms, she continued to have difficulty with overestimating the probability of a rare event (i.e., a fatal car accident). Despite the intensive focus of several sessions and at-home guided worksheets, she had difficulty generating more probable explanations for the event (i.e., "I cannot reach him because his phone is turned off" or "His phone is in his gym locker, and he cannot hear it.").

Further, she had difficulty generating alternate explanations for situations covered previously in session when they reoccurred. For example, the client experienced frequent worries about nighttime home invasions despite never having been the victim of such a crime. With the help of the psychotherapist in the treatment room, she was able to generate alternative explanations (i.e., "That sound was an acorn on the roof") using previous experience as evidence and generate pie charts on the wall-mounted white-board. However, despite the psychotherapist's provision of small cognitive coping cue cards, the client had difficulty recalling these probabilities and cognitive coping skills *in situ*.

After problem-solving with the client about the difficulty of generalizing cognitive coping skills outside of session and discussing the inconvenience of using index cards to cue coping in the middle of the night, the psychotherapist used her smartphone to photograph the white-board and to send the photo of a completed pie chart to the client's cell phone and e-mail. The client was then able to save the photo on her own cell phone, which she used as an alarm clock and kept with her at all times. She found the image of the probability pie chart in her own handwriting particularly helpful in cueing the cognitive coping skills because (a) the photo was a highly salient reminder of situationally specific coping skills and (b) the photo was easily accessible on her own mobile device. Use of such photos helped her to manage her worry in those situations and then to generalize those skills beyond domains covered by the original photos.

Outcomes for this case were tracked during treatment using empirically validated and idiographic assessment instruments, including the PSWQ. Throughout psychotherapy, the client's PSWQ scores followed a slow but steady downward trajectory, consistent with her report of decrease in worry symptoms on idiographic measures.

Implications for Practice

Several themes emerge from the case studies detailed in this paper. First, newer technologies can facilitate individualization of treatment. The psychotherapists treating these cases confronted complex presentations involving comorbid disorders, making treatment difficult. The cases demonstrate that cognitive-behavioral psychotherapy is robust to adaptation necessitated by the complex range of difficulties encountered in a clinical setting. Time constraints can make adapting treatment difficult. However, the use of smartphones and other types of technology can help to make adaptations more efficient and easily integrated into client care. In the second case study involving the PMR recording, the psychotherapist did not need to take any additional time to make a recording tailored to the specific client, and that recording was quickly disseminated to the client via e-mail. Similarly, the photo and e-mail capabilities of the smartphone in the third case study allowed the client to draw on her own personalized cognitive strategies whenever she wanted to review them or apply them to personally relevant anxiety-provoking situations.

Another theme to emerge is that these new technologies can help extend psychotherapy gains outside of sessions. In the second case study, the psychotherapist's smartphone recording and the client's MP3 player helped facilitate the client's use of PMR practice at home. Similarly, the third case study client benefited from looking at photos of the in-session white-board when she was trying to use cognitive strategies on her own to challenge her anxious thoughts. It is easy to imagine other beneficial applications of smartphones in psychotherapy (see Table 1). Smartphones often have audio playing capabilities, allowing clients to easily transport relaxation or guided imagery recordings. Another potential use of smartphones in conducting in vivo exposures is tracking ratings of fear using phone-adapted spreadsheet programs, such as QuickOffice. The spreadsheet file is created using the client's ratings during exposures, and after a series of exposure trials, a psychotherapist could quickly access this information via his or her computer to generate a graph of the client's fear ratings upon returning to the office.

A third emergent theme is that technology can help to assess treatment progress. In the first case study, the client who struggled with compulsive hoarding was treated in her home, and the psy-

chotherapist was able to make direct observations of the client's living space. This technology use might be especially valuable for psychotherapists who are unable to provide in-home treatment. Clients could use their personal smartphone, or digital still or video camera, to document progress for their psychotherapist, providing invaluable direct evidence of improvement to supplement monitoring of treatment effectiveness by verbal self-report and psychometric instruments. Smartphones and other mobile devices are now commonly used in social sciences research to collect similar data (Raento, Oulasvirta, & Eagle, 2009). In addition to hoarding, pictorial documentation of treatment progress could be useful in treating other disorders, such as trichotillomania or skin-picking, for which there is concrete visual evidence of progress. Pictures can provide evidence of treatment progress to the client in a much more concrete and relevant way than a questionnaire score, and, as in the first case study, serve to motivate efforts toward additional treatment gains.

Ethical Considerations

The use of smartphones may have unintended consequences, and psychotherapists should carefully assess whether they are a useful adjunct to treatment on a client-by-client basis. For example, one early study involving mobile phone technology to assist with driving exposures found that the phone came to serve as a safety signal for the driver (Flynn, Taylor, & Pollard, 1992). Boschen (2009a) points out that clients, particularly those with anxiety, may become overreliant on devices such as smartphones and feel at a loss when they are in anxiety-provoking situations and their smartphone is not accessible. To minimize this risk, mental health providers should have clients practice coping and exposure techniques with and without a smartphone (Boschen, 2009a). Finally, mental health providers should closely monitor client use of smartphones to ensure that it does not result in multitasking that creates additional anxiety (Boschen, 2009a), puts the client in danger (e.g., by texting while driving), or serves as an anxiety-reducing distraction during exposure treatment.

The use of new technology as described in the case studies raises a number of ethical considerations, most of which pertain to Standard 4 (Privacy and Confidentiality) of the American Psychological Association's (APA) Ethical Principles of Psychologists

Table 1
Potential Psychotherapeutic Uses of Smartphones

Smartphone features	Potential psychotherapeutic uses
Camera	<ul style="list-style-type: none"> Recording and sharing images of dry-erase board or other work done in session Documenting visual evidence of treatment progress (e.g. alopecia for trichotillomania, skin presentation for skin picking, or accumulation for compulsive hoarding) Showing pictures to client to provide feedback, show treatment progress, or provide motivation
E-mail	<ul style="list-style-type: none"> E-mail picture, audio, and video files to client E-mail homework sheets or homework suggestions to client E-mail measures, questionnaires, or other time-consuming paperwork to client to fill out in advance of session
Voice recorder, MP3 music capabilities	<ul style="list-style-type: none"> Psychotherapist can record a personalized progressive muscle relaxation or guided imagery script for the client in session, then e-mail the audio file to the client for his or her personal use Clients using smartphones can take their recordings with them when in different situations, making the technique transportable
Document viewing or editing	<ul style="list-style-type: none"> Accessing worksheets (.pdf or .doc) in session and e-mailing to client Using spreadsheet function to track fear ratings during exposures

and Code of Conduct (APA, 2010; Welfel, 2006). It is, of course, always important for psychotherapists to guard client confidentiality carefully, and this new technology brings new challenges to maintaining confidentiality, especially if the devices are used for both professional and personal purposes and are carried outside the clinic. Psychotherapists need to be familiar with security settings and understand how their devices save and send information. For example, psychotherapists should password-protect files in which client phone numbers and e-mails on their phones are saved, and these files should not be accessible to others. Also, many modern smartphones automatically save pictures and videos to larger caches. After e-mailing video or picture files to clients, psychotherapists should take care to delete from their phones any files containing personal information or immediately download these files to a secure server for safekeeping before permanently deleting the files from their smartphones. A safer option to consider is to designate a smartphone that is strictly for professional use and keep it within the clinic at all times.

Psychotherapists and clients should be aware of the inherent security risks that e-mail poses. When an e-mail is sent, it moves from the sender's computer to the server of the sender's Internet service provider (ISP). Increasingly, this process is done wirelessly. When a website connects to a secure server, most Internet browsers will automatically encrypt any data being sent, preventing interception by third parties. Once the sent data reaches its destination, it is decrypted, and the recipient can read the message. Within this process, there are several opportunities for breaches of confidentiality. Psychotherapists should make sure that the device from which they are sending messages is secure so that other people in the sender's office or home cannot access the sender's e-mail. Senders should not leave browser windows open or share e-mail passwords with others. The computer, the e-mail account, and all files should be password-protected. Unprotected files should not be saved to a home computer, laptop, or smartphone in the event these devices are lost or stolen.

Psychotherapists and patients should take care not to exchange any sensitive or confidential information over an insecure connection. To tell if the connection is secure, examine the address bar. Insecure sites begin with "http" while secure sites begin with "https." Even when a site begins with "https," the connection is not always completely secure. Some Web pages have both secure and insecure information on the same webpage, setting up a loophole that some hackers can exploit. E-mail users are urged to check the digital signature to authenticate the source of an e-mail message. Different browsers and e-mail accounts use different types of encryption for data. Even when data are encrypted, there is still a chance that data can be digitally intercepted. Psychotherapists and clients should familiarize themselves with other security risks and with the range of security settings and safety options currently available on their phone, browser, and e-mail programs and together determine how e-mail communication can take place most securely.

Security breaches can also occur on the recipient's end. Before e-mailing any files to a client, the psychotherapist should be sure that the correct client e-mail address is being used and that the client does not share e-mail access with anyone he or she would not want viewing the files. Psychotherapists may choose to keep the e-mail message brief and should take care that there is nothing in the message that would indicate that the e-mail was related to

mental health treatment. For example, when e-mailing the relaxation MP3 file to the second case study client, the psychotherapist stated briefly in the e-mail, "Here is a helpful tool." The psychotherapist provided specific instructions to the client in session regarding how to use this recording for homework.

A psychotherapist's decision to share personal contact information (i.e., an e-mail address) with a client should always be accompanied by a discussion about appropriate use of the contact information. For example, psychotherapists should clearly communicate to clients whether the e-mail address used to share video, audio, text, or picture files can also be used for emergency contact. If the psychotherapist, clinic, or practice does not have a 24-hr emergency contact, then the client should be aware that a private e-mail is not an acceptable alternative, and the psychotherapist should ensure that the client is aware of whom to contact in case of an emergency.

Standard 3.10 (Informed Consent) of the APA Ethics Code (APA, 2010) is also relevant when clients will have novel technology incorporated into their psychotherapy. If psychotherapists intend to use a smartphone or e-mail as a psychotherapeutic tool, there should be informed consent about the risks and benefits associated with this type of technology. According to Section 10.01 of the Ethics Code (APA, 2010), psychotherapists should try to obtain informed consent as soon as possible in the psychotherapeutic process (Fisher & Oransky, 2008). In all three of the case studies in this paper, novel technologies had not been originally intended to be adjuncts to treatment; rather, the use of technology arose organically. Fisher and Oransky (2008) write that informed consent should be considered an ongoing process. If the practice of using a smartphone in psychotherapy becomes standard for a practitioner, this information should be added into the intake paperwork apprising the clients of the aforementioned risks to facilitate accurate and complete informed consent.

Finally, numerous authors (Clough & Casey, 2011b; Fisher & Oransky, 2008; McMinn et al., 2011; Rosen & Weil, 1996) have commented on the relative lack of clear ethical guidelines pertaining to technology use in the field of psychology. McMinn et al. (2011) went so far as to write, "It appears that independent practitioners are not a technologically adventurous group" (p. 181). In order for professional psychology to better embrace new technology in research and practice, McMinn et al. (2011) recommend training that is specific to new technologies. Given the fact that younger psychotherapists tend to feel more comfortable with technology than older psychotherapists, relationships between these two groups should be encouraged, with the younger demographic taking the lead in training the older group in the use of novel technologies, perhaps in the form of continuing education classes, while more established professional and academic psychologists should ensure that less experienced psychotherapists receive basic training in field-relevant technology (McMinn et al., 2011). The authors also suggest that, when it comes time to set ethical standards pertaining to technology, mental health professionals who have both clinical experience and experience with cutting-edge technology should be sought out. Finally, the authors posit the idea that APA divisions could make a list of "best practices" related to technological advancements rather than relying on committees to compile such a list.

Conclusion

The use of technology in mental health treatment has the potential to lead to better and more accessible client care. The three case examples presented here highlight the use of new but widely available technology to increase the individualized nature of patient care, tailoring assessment and treatment strategies to individual clients' needs and presentations. Future research may focus on studying the benefits of integrating these types of technology into practice, compared to treatment as usual. Whereas research has provided psychotherapists with empirically supported interventions and normative assessment techniques, it is crucial to remain flexible and creative as psychotherapists in order to ensure that our interventions and assessments are best suited to the clients we treat, and that we are not using a "one size fits all" approach to client care. Technology is one way of individualizing treatment and increasing efficiency of the treatment approaches we use.

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Call for Papers: Empirical Studies on Psychotherapist Training and Development

Psychotherapy invites manuscripts for a special issue on *Empirical Studies on Psychotherapy Training and Development*. There is great interest in understanding how different training experiences impact professional development, psychotherapy process and outcomes. Although to date this research is limited and often demonstrates mixed results. We welcome papers empirically examining these issues across a range of different training experiences, from a macro (i.e. graduate degree program, post-doctoral certificates, etc), through intermediate (i.e. year of training or supervision, specific course, instruction in manualized treatments, etc) to a micro level (i.e. brief focused initiatives, workshop, etc). Studies using quantitative or qualitative methods, as well as those demonstrating null or negative results, are welcomed. In addition, meta-analyses on different training experiences that both synthesize the existing empirical literature as well as offer direction for future training, research and practice are encouraged.

While this call is for empirically based studies on the impact of the training, manuscripts submitted to this Journal must also have a very clear statement and accessible implications for those actively involved in the training and supervision of psychotherapists. Therefore, submitted studies should provide very clear and detailed descriptions of training initiatives to facilitate their evaluation, implementation and replication. This may be accomplished as part of the paper, in an appendix or in supplemental material.

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