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A Comparison Between Telehealth and Face-to-Face Brief Alcohol Interventions for College Students

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A COMPARISON BETWEEN TELEHEALTH AND FACE-TO-FACE BRIEF ALCOHOL

INTERVENTIONS FOR COLLEGE STUDENTS

by

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Problematic alcohol use is a common occurrence among college students. While empirically supported interventions exist, their access is typically limited to those who attend large universities. In the health care field there has been an expansion of services provided via telehealth to increase client access to treatment. However, the evidence is mixed regarding the effectiveness of face-to-face versus telehealth interventions and there is a gap in the literature regarding the use of telehealth interventions for brief alcohol interventions in college students. As such, the purpose of this study was to test the effectiveness of a well-validated brief alcohol screening and intervention for college students (BASICS) when conducted face-to-face or through a videoconferencing system. The researcher also sought to determine how treatment modality may impact therapy process variables (working alliance and client satisfaction), how realistic the interaction felt to the participants (as measured via telepresence), and how these factors influenced treatment outcome.

Participants included 51 college students who engaged in binge drinking over the last two weeks and consented to participation in research. They were randomly assigned to receive the face-to-face or telehealth intervention and completed a variety of questionnaires before the intervention and after each session. Follow up data on the participants alcohol use and alcohol-related problems was collected at 1, 2, and 3 months post treatment. Data were

analyzed in SAS utilizing multilevel modeling which included the modeling of treatment outcome trajectories and the influence of predictors on the trajectory of change for each outcome.

Results indicated that the intervention significantly reduced alcohol consumption and alcohol problems regardless of condition. Both conditions saw an increase in client satisfaction and working alliance between the two sessions. The level of working alliance did significantly impact one outcome trajectory, but there was no interaction between condition and either of the process variables. Telepresence was measured to be high in the telehealth condition. In sum, the results of this study suggest that the BASICS intervention can be effectively delivered via telehealth for college students.

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Chapter 1: Introduction to the Study

Background

Alcohol abuse is a common problem among college students, with at least 45% of

college students admitting to biweekly binge drinking (American College Health

Association, 2006; Cahill & Byrne, 2010; O'Malley & Johnston, 2002b) and the average

student reporting around 3 episodes of binge drinking per month (Lorant, Nicaise, Soto, &

d'Hoore, 2013). The consequences of alcohol abuse are extensive and vary from a number of

health risks (e.g., Arif & Rohrer, 2005; Baliunas et al., 2009; Hatton et al., 2009) to increased

rate of accidental injury and death (Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002).

Moreover, young adults are more likely than any other population to engage in drunk driving

and have the highest rate of alcohol-related automobile injury or death (Office of Community

Health Development, 2007). Binge drinking rates among young adults age 19-25 are on the

rise, increasing from 43.8% to 47.3% in the last two years, with 28.2% of binge drinkers

report driving after binge drinking (Nebraska Office of Highway Safety, 2012). With so

much harm associated with binge drinking, programs to reduce problematic alcohol use in

college students are increasing.

The Alcohol Skills Training Program (ASTP) is designed specifically for use with

college students and is highly effective at reducing problematic alcohol use (Kivlahan,

Marlatt, Fromme, Coppel, & Williams, 1990). This program is delivered in a variety of

different modalities, including individual (Dimeff, Baer, Kivlahan, & Marlatt, 1999), group (Fromme, Marlatt, Baer, & Kivlahan, 1994; E. T. Miller, Kilmer, Kim, Weingardt, & Marlatt, 2001), and online only (Carey, Scott-Sheldon, Elliott, Bolles, & Carey, 2009) interventions, with the individual intervention having a greater effect (Carey, Henson, Carey, & Maisto, 2009). The Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff et al., 1999) is an individual brief motivational intervention which aims to significantly reduce rates of problematic drinking and associated risk in college students. A meta-analysis conducted by Fachini, Aliane, Martinez, and Furtado (2012) indicated that the BASICS program is demonstrated to be highly effective with college students who report binge drinking. This intervention includes a motivational aspect to increase motivation to change drinking behavior, an alcohol and normative education component, and promotes the development of drinking rules (e.g., making travel plans before drinking, setting and observing limits; Dimeff et al., 1999).

Though the BASICS program is demonstrated to be effective, many individuals do not have access to this alcohol intervention. Specifically, many rural areas lack adequate screening and interventions, and the available providers are poorly trained (Gordon, Ettaro, Rodriguez, Mocik, & Clark, 2010). This is particularly concerning as individuals in rural areas are at higher risk of alcohol-related harm, with crash rates attributed to alcohol being up to 11.6 times higher in rural areas (U.S. Census Bureau, 2011). Additionally, young adults who live in rural areas are at the highest risk of driving after binge drinking, with 20% of rural past month binge drinkers driving after drinking compared to only 12.9% in urban areas (Nebraska Office of Highway Safety, 2012). This young adult population is also more likely than all other age groups to drive under the influence, to be arrested for DUI, and incur

alcohol-related automobile injury or death (Office of Community Health Development, 2007) and higher rates of binge drinking significantly increases rates of drunk driving (Nebraska Office of Highway Safety, 2012). There is an important need to increase the implementation and accessibility of interventions, which reduce alcohol consumption and associated consequences.

Since empirically supported interventions are more accessible in urban areas and less accessible to rural high-risk populations, treatment providers are beginning to utilize telehealth technology to provide alcohol treatment services to those located in rural areas (Baca, Alverson, Manuel, & Blackwell, 2007; SAMHSA, 2007; Tucker & Simpson, 2011). Despite these efforts, this emerging form of treatment delivery has yet to be applied to brief prevention efforts for college binge drinking. At best, on-line alcohol assessment is regularly conducted among college students (e.g., Walters, Miller, & Chiauzzi, 2005). However, research indicates that in-person interventions (e.g., BASICS) may be more influential for some, such as women (Carey, Carey, Henson, Maisto, & DeMartini, 2010; Carey, Henson et al., 2009) and those who engage in more high-risk drinking (e.g., greek members; O'Brien et al., 2013). Moreover, BASICS is demonstrated to be more effective across multiple problematic alcohol use outcomes and maintains change for a longer period of time than online only interventions (Amaro et al., 2009; Carey et al., 2010; Carey, Henson et al., 2009). As such, telehealth approaches may afford an opportunity to develop an effective BASICS delivery system for rural college populations.

The present study aimed to test the feasibility of the degree to which BASICS is impactful using telehealth delivery methods. The primary aim was to determine how effective BASICS is at reducing binge drinking and associated alcohol problems when

delivered through telehealth compared to face-to-face. An argument for this evaluation was made by discussing existing literature on alcohol abuse and consequences on college campuses. Next, alcohol treatment literature as it applies to brief interventions is reviewed, followed by the examination of a videoconferencing telehealth system for delivery of a brief alcohol intervention. These sections and subsections within are then followed by the study aims, method, results, and discussion.

Alcohol Abuse and Consequences

O'Malley and Johnston (2002a) indicate that between eighty and eighty-five percent of college and university students in the United States report drinking alcohol and more than thirty percent meet DSM-IV diagnostic criteria for alcohol abuse (Knight et al., 2002). Nationally, approximately 1700 college-aged individuals die each year from alcohol-related injuries, the majority of which are vehicular-related (NIAAA, 2007). The negative effects have an enormous cost to society, with over 184 billion dollars spent annually to manage problems associated with alcohol abuse (Centers for Disease Control and Prevention, 2004), and 52 billion of these going towards underage drinking (Pacific Institute for Research and Evaluation, 1999). With all the costs associated with underage binge drinking, it has been identified as a major national health problem (U.S. Department of Health and Human Services, 2000).

Alcohol Health Risks

Long-term effects of alcohol abuse include the development of chronic diseases such as liver disease (Hatton et al., 2009; Parry, Patra, & Rehm, 2011; Polednak, 2012; J. Rehm, Samokhvalov, & Shield, 2013), type 2 diabetes (Baliunas et al., 2009; Hodge, English,

O'Dea, & Giles, 2006), and a variety of different heart problems (Nicoll & Henein, 2011; Parry et al., 2011; Shaper, 1990). Moreover, excessive alcohol consumption may contribute to high blood pressure (Kornitzer, Dramaix, & de Backer, 1999; Zhang et al., 2001), obesity (Arif & Rohrer, 2005; Duncan, Grant, Bucholz, Madden, & Heath, 2009), and even certain types of cancer (Foster & Marriott, 2006; Parry et al., 2011). Alcohol also leads to a loss of productivity (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011) as well as shortened life expectancy (Foster & Marriott, 2006; Nashold & Naor, 1981; J. r. Rehm & Monteiro, 2005). In the short term, alcohol impairs the ability of the body to process nutrients and may lead to vitamin deficiencies, such as thiamine deficiency in Wernicke-Korsakoff syndrome (Pitel et al., 2011), as well as lead to poor absorption of vitamins Folate (Halsted, Villanueva, Devlin, & Chandler, 2002) and B12 (Laufer et al., 2004). Binge drinking in particular may result in poor nutrient absorption due to patterns of fasting prior to drinking to reach intoxication more rapidly as well as diarrhea and vomiting that may occur after excessive alcohol consumption (Foster & Marriott, 2006).

High Risk Behaviors in College Students

In addition to health risks, there are a number of other high-risk drinking behaviors associated with college drinking patterns. For instance, a recent high-risk drinking trend among college students is the consumption of alcoholic energy drinks, which are non-alcoholic beverages with added caffeine, vitamins, or other substances with stimulant properties (Brache & Stockwell, 2011). Rates of alcohol and energy drink consumption are very high, with between 51 and 75 percent of college students report mixing alcohol and energy drinks (Berger, Fendrich, & Fuhrmann, 2013; Malinauskas, Aeby, Overton, Carpenter-Aeby, & Barber-Heidal, 2007). The consumption of alcoholic energy drinks

increases risk for unprotected sex (Berger et al., 2013; Snipes & Benotsch, 2013) sexual perpetration or victimization (O'Brien, McCoy, Rhodes, Wagoner, & Wolfson, 2008) and impaired driving, as students are more likely to underestimate their level of intoxication (Arria & O'Brien, 2011; Brache & Stockwell, 2011; Thombs et al., 2010). Moreover, individuals who consume alcoholic energy drinks report more frequent alcohol consumption and higher rates of binge drinking (Marczinski, Fillmore, Bardgett, & Howard, 2011; O'Brien et al., 2008).

Another high risk behavior is pre-gaming, in which college students drink before attending another social function, an activity which frequently results in increased alcohol consumption (Paves, Pedersen, Hummer, & LaBrie, 2012). Additionally, while college students are able to generally articulate guidelines to safer drinking, their interpretation of these guidelines (e.g., designated drivers should be able to drink some or they will not have fun) often remain indicative of problematic drinking (Barry & Goodson, 2011).

Binge Drinking

One of the highest risk behaviors that college students can engage in is binge drinking. Binge drinking differs from alcohol abuse in that it refers specifically to a single drinking event in which five or more drinks are consumed for men or four or more drinks are consumed for women (H. Wechsler, Dowdall, Davenport, & Rimm, 1995). Forty-five percent of college students admit to at least biweekly binge drinking (American College Health Association, 2006; Cahill & Byrne, 2010; O'Malley & Johnston, 2002b), with 3 binge drinking episodes per month reported by the average student (Lorant et al., 2013). Moreover, in the state of Nebraska, binge drinking rates among young adults age 19-25 are on the rise, increasing from 43.8% to 47.3% in the last two years, with 28.2% of binge drinkers report

victims reporting intoxication at the time of rape (Mohler-Kuo, Dowdall, Koss, & Wechsler, 2004). Conversely, men who consume alcohol excessively are more likely to be perpetrators of sexual assault (Abbey, McAuslan, & Ross, 1998; Carr & VanDeusen, 2004; Rapoza & Drake, 2009).

A variety of legal risks are present with binge drinking. Wechsler and colleagues (2000) determined that up to 12.7 percent of college student binge drinkers report having legal trouble associated with their drinking behavior. The majority of legal infractions related to drinking are Minor In Possessions (MIP; 70%) or Driving Under the Influence (DUI; 17%) charges, with the majority of charges being to students that are not of legal age (Thompson, 2007). For students of legal drinking age, there is a consistent risk of procuring to minors, a frequent occurrence among college campuses (Brown, Matousek, & Radue, 2009). Moreover, students who receive more than one legal charge are thirty one percent more likely to drop out of school (Thompson, 2007). With the elevated risk of harm associated with binge drinking, college programs across the country are developing interventions to reduce problematic alcohol use and/or harm associated with such use. The next sections will thoroughly discuss these interventions and make a case for BASICS as the intervention best suited for high-risk rural drinkers and videoconferencing as the preferred delivery method.

Brief Interventions for Alcohol Abuse

Dimeff, Baer, Kivlahan, and Marlatt (1999) define brief interventions as "minimal interaction with a medical or mental health professional focusing on the health risks associated with drinking, and ranging from several minutes in length up to several sessions"

(p. 23). Brief interventions are most efficacious for individuals who have experienced

negative drinking-related consequences, but who do not meet criteria for alcohol dependence

(Institute of Medicine, 1990; World Health Organization (WHO) Brief Intervention Study

Group, 1996). The programs are a mix of motivational interviewing (W. R. Miller &

Rollnick, 2002), relapse prevention cognitive-behavioral techniques (Marlatt & Gordon,

1985), harm reduction (Riley, 1994), and personalized feedback (Dimeff et al., 1999; Walters

& Bennett, 2000). As such, each element of brief interventions is discussed before

presenting the evidence for these interventions.

Motivational Interviewing

Motivational Interviewing (MI) is based on the concept that individuals are often

resistant to change and focuses on building motivation to change in a non-confrontational

manner (W. R. Miller & Rollnick, 2002). The approach taken is based on Prochaska's

transtheoretical model which focuses on stages of change that are necessary to reduce high-

risk behaviors (Prochaska, DiClemente, & Norcross, 1992). Prochaska and colleagues

(1992) identify five stages that individuals move through in order to successfully change a

high-risk behavior: pre-contemplation, contemplation, preparation, action, and maintenance.

MI works towards moving an individual through these stages of change with MI consistent

skills, including open ended questions, reflective listening, affirmations, summarization and

eliciting change talk from the client (W. R. Miller & Rollnick, 2002). MI aims to minimize

defensiveness through a non-confrontational approach which guides the client through

consideration of his/her difficulties and encourages the client to reach his/her own

conclusions regarding behavior change (W. R. Miller & Rollnick, 2002). MI also includes

stimulus control techniques that focus on avoiding triggers to use and learning more positive,

non-using responses to encountered triggers (Blume, Resor, Villanueva, & Braddy, 2009).

Moreover, MI encourages the development of non-using coping skills such as cognitive

restructuring, improving drink refusal skills, and examining alternative methods to cope with

stress and negative emotions (Kadden, 1999).

One area of particular emphasis in MI is that of the relationship between the client

and the therapist. Miller and Rollnick (2002) stress the importance of alliance factors

including genuineness, empathy, acceptance, and a non-judgmental stance from the therapist

in the interactions with the client. MI consistent therapist-client interaction is said to be

equivalent to the development of a strong working alliance in the therapeutic relationship

(Moyers, Miller, & Hendrickson, 2005). The therapeutic alliance has also been found to be a

significant predictor of treatment outcome among outpatient clients being treated with MI for

alcohol problems (Connors, Carroll, DiClemente, Longabaugh, & Donovan, 1997). As will

be discussed within the context of brief interventions, researchers debate about the degree to

which the therapeutic alliance is important in brief interventions for college students.

Relapse Prevention

College student interventions also have components of relapse prevention. Relapse

prevention is an amalgamation of social learning theory and cognitive behavioral therapy

(Marlatt & George, 1984). It focuses on assisting the client in becoming more aware of the

process involved in relapse and associated familial, emotional, and cognitive risk factors

(Marlatt & Witkiewitz, 2005). Relapse Prevention includes components of cognitive

restructuring to alter cognitions about drinking, mindfulness to achieve increased awareness

and acceptance, and focuses on learning new, non-drinking coping mechanisms (Blume et

al., 2009). Brief interventions focus primarily on the relapse prevention components of the

identification of risky events and utilize cognitive restructuring to assist the client in changing their thinking related to drinking. Specifically, brief interventions encourage monitoring of drinking behavior, provide education about blood alcohol levels, assist the client in setting drinking limits, and planning to refuse drinks or drink in moderation (Kivlahan et al., 1990). Additionally, brief interventions are consistent with the viewpoint taken in relapse prevention in that subsequent alcohol use is expected and seen as an opportunity to provide informative feedback to the treatment process, rather than constituting a treatment failure (Marlatt & Witkiewitz, 2005).

Harm Reduction

Harm Reduction is another theory that is an integral part of brief interventions. Harm reduction approaches acknowledge that problematic behaviors (e.g., alcohol abuse) occur on a continuum from more harmful to less harmful and encourage movement towards less harmful behaviors (Dimeff et al., 1999). Harm reduction approaches are geared towards individuals with problematic drinking, but not alcohol dependence. These approaches utilize behavioral modification strategies to reduce harm related to drinking (Marlatt, 1998). They are utilized in a variety of settings (e.g., colleges, places of employment) and have widely demonstrated efficacy and effectiveness across many populations (Logan & Marlatt, 2010). Blume and colleagues (2009) describe some harm reduction strategies including, but not limited to increasing time allocated for other activities which reduces drinking time, decreasing the amount of alcohol consumed per drink by measuring the amount of hard alcohol in each drink, reducing pace at which drinks are consumed, and conducting trial alcohol reduction or abstinence periods. Unlike most substance use approaches that advocate abstinence, harm reduction allows for a more flexible drinking goal, targeting the increase of

clients' treatment engagement (Larimer & Marlatt, 1990). While this approach is oftentimes referred to as ideal for college students who do not meet alcohol dependence criteria, college students who are pregnant, have health problems, or serious legal problems may be better served by an abstinence-based approach (Dimeff et al., 1999).

Personalized Feedback

Personalized feedback approaches include the gathering of data about the client, the delivery of client-specific information, and suggestions about ways to utilize the newly acquired knowledge (Baer & Marlatt, 1992). The personalized feedback provided typically contains information about the client's drinking pattern, actual versus perceived peer normative consumption, consequences of alcohol use, some education, and methods to reduce harm associated with drinking (Walters & Neighbors, 2005). Approaches consisting only of personalized feedback and advice have demonstrated equivalent effectiveness to a six-week alcohol education class and self-help manual (Baer & Marlatt, 1992).. Moreover, many studies have determined that personalized feedback only interventions do significantly reduce problematic drinking among college students (Bryant, Henslee, & Correia, 2013; Carey, Carey, Maisto, & Henson, 2006; Larimer & Cronce, 2007; Walters & Neighbors, 2005).

Brief Motivational Interventions (BMIs)

As mentioned earlier, brief interventions have been designed for college students and these interventions combine components of motivational interviewing, relapse prevention, cognitive behavioral techniques, harm reduction, and personalized feedback. These approaches are termed Brief Motivational Interventions (BMIs) and have been demonstrated to be highly effective for college students engaging in problematic alcohol use, with the

treatment effects lasting as long as four years post intervention (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Carey et al., 2006; Larimer & Cronce, 2007). Kivlahan and colleagues (1990) created the first Alcohol Skills Training Program (ASTP), an eight-week intervention including alcohol education, drinking monitoring, setting drinking limits, and relapse prevention strategies. Since then, many additional ASTP programs have been created which all follow the general approach of cognitive-behavioral relapse prevention strategies, motivational interviewing techniques, and harm reduction elements (Dimeff et al., 1999). ASTP adds the additional component of providing alcohol consumption norms for the clients peer group to his or her current alcohol consumption and estimated level of peer consumption (Agostinelli, Brown, & Miller, 1995), as prior research indicates that college students typically over-estimate their peers level of alcohol consumption (Borsari & Carey, 2003).

The ASTP program is conducted in a variety of empirically supported modalities. ASTP may be conducted through a six-unit training manual (Baer et al., 1991), a six to eight week classroom training course (Dimeff et al., 1999), a two session group intervention (Fromme et al., 1994; E. T. Miller et al., 2001), a two session individual intervention (Dimeff et al., 1999), and a growing number of interventions are conducted solely online (Carey, Scott-Sheldon et al., 2009). Many studies have been conducted on ASTP modalities, suggesting that these are effective interventions to reduce college student binge drinking and associated harms (e.g., Baer, 1993; Baer et al., 2001; Baer et al., 1992; Borsari & Carey, 2005; Carey et al., 2006; Kivlahan et al., 1990; Marlatt et al., 1998).

One individualized form of ASTP is the Brief Alcohol Screening and Intervention for College Students (BASICS), which also combines motivational interviewing, harm reduction, relapse prevention, and personalized feedback (Blume et al., 2009). When

analyzed separately from other ASTP interventions, BASICS is determined to be highly effective at reducing alcohol consumption and alcohol problems (Fachini et al., 2012) and has a greater effect than online only interventions (Amaro et al., 2009; Carey et al., 2010; Carey, Henson et al., 2009). The BASICS intervention consists of 45 minutes for the client to fill out assessment measures and two 50 minute sessions with a therapist, who utilizes motivational interviewing specific to the client's readiness to change and specified drinking goals (Dimeff et al., 1999).

Session one is focused primarily on rapport building, assessment of drinking patterns, risk factors, perceived drinking norms, and alcohol consequences through a clinical interview, discussion of expectancies, and readiness to change the problematic drinking behavior (Dimeff et al., 1999). A feedback packet is prepared between the first and second session by the therapist or an assistant utilizing information acquired during the first session and the written assessment measures (Dimeff et al., 1999). The second session is a custom-tailored feedback session in which the therapist provides some personalized education, discusses the feedback with the client, and assists him or her in recognizing risk, setting drinking goals, and making changes to his or her drinking habits (Dimeff et al., 1999).

Online Brief Motivational Interventions

Online interventions are becoming increasingly popular due to their ability to reach large audiences yet be individualized (Copeland & Martin, 2004), lack travel requirements (Khadjesari, Murray, Hewitt, Hartley, & Godfrey, 2010), and have a low cost to implement, particularly when compared to face-to-face interventions (Linke, Murray, Butler, & Wallace, 2007). Additionally, consumers of these interventions have increased anonymity which is posited to improve honesty and disclosure (Turner et al., 1998). Many studies have

determined that online only alcohol interventions are effective at reducing problematic

alcohol use and associated consequences (e.g., Bersamin, Paschall, Fearnow-Kenney, &

Wyrick, 2007; Doumas & Andersen, 2009; Kypri et al., 2004; Neighbors, Larimer, & Lewis,

2004). Cunningham (2011) groups online interventions into those based on brief

motivational interventions and feedback (e.g., ASTP) and those that are a more pure

educational approach, suggesting greater effectiveness for the online BMI interventions.

Moreover, when compared to no intervention, researchers suggest that online interventions

are more effective at reducing short-term (5 weeks or less) alcohol consumption per occasion

while in the long term (greater than five weeks) they are more effective at reducing alcohol

problems and drinking frequency (Carey, Scott-Sheldon et al., 2009).

Considerations Regarding Alcohol Interventions for College Students

With so many different alcohol interventions for college students, it is important for

providers to be knowledgeable of their differential effectiveness, depending on population

and approach. Among college students, alcohol interventions that are delivered in person, to

individuals rather than groups, and have the components included in BASICS are determined

to be superior (Carey, Scott-Sheldon, Carey, & DeMartini, 2007). As will be discussed in a

later section, this evidence is consistent with telehealth research suggesting that interventions

including direct therapist-client contact are more effective than those without such contact

(Spek et al., 2007). Additionally, it is important to note that those with comorbid mental

health diagnoses do reduce their alcohol consumption with brief interventions, but may

require longer interventions to address comorbidity and improve overall functioning (Baker,

Hiles, Thornton, Hides, & Lubman, 2012). Moreover, while the development of the

therapeutic alliance is important in MI interventions, brief interventions by nature must be

focused which may leave little time to build rapport. Because of this emerging evidence, the present study aims to test an intervention (i.e., BASICS) that has the greatest impact on a high-risk population, such as rural college students. This intervention is particularly well suited for this study due to the overlapping evidence in the following sections that access to such interventions is challenging for rural colleges and telehealth communication methods may serve as an answer to the lack of resources.

The Rural Population, Alcohol Problems, and Access to Services

As delineated earlier, there is strong evidence to support that brief motivational interventions (e.g., BASICS) are highly effective at reducing problematic drinking (Carey et al., 2007). Moreover, a review of the literature on alcohol skills training programs elucidates that only large research universities are providing these in-person interventions, as no studies appear to be conducted at small colleges or with rural populations. This is not surprising, as over half of the counties in the United States do not have any mental health professional, including a psychologist, psychiatrist, or social worker (American Psychological Association, 2001). Rural access to in-person alcohol interventions is also very limited (Baca et al., 2007) thus making it highly unlikely for individuals who attend rural colleges to have access to alcohol interventions.

This is particularly concerning because there is evidence that those in rural areas are at the highest risk for negative effects of alcohol, with higher rates of alcohol abuse in rural versus urban populations (Substance Abuse and Mental Health Services Administration, 2012) and more accidents related to drunk driving (U.S. Census Bureau, 2011). Additionally, those in rural areas are more likely to begin drinking at an earlier age and have a higher level of binge drinking (Office of Applied Studies, 2003). Moreover, those in rural

areas are far more likely to become involved in the criminal justice system (Substance Abuse and Mental Health Services Administration, 2012), possibly due to the lack of behavioral interventions available for referral.

The term rural accounts for several different classifications of populations. Completely rural areas are defined as areas with a total population at or less than 2,500, while less urbanized areas account for areas with a total population at or less than 20,000 (Office of Management and Budget, 2003) and urban clusters include an area with a population between 2,500 and 50,000 individuals (U.S. Census Bureau, 2010). It is estimated that around 30% of the population of the United States live in an area with fewer than 50,000 people (U.S. Census Bureau, 2010). These areas are also unlikely to have large research universities with resources for brief interventions.

Those who live in rural areas in general have less access to many resources (Clark, Leukefeld, & Godlaski, 1999). Additionally, when travel barriers are present, they reduce treatment engagement and lead to poor follow-through with treatment (Fortney, Booth, Blow, Bunn, & Loveland Cook, 1995). This may result in individuals receiving interventions by less qualified individuals or receiving no interventions at all. The reduction of health disparities between rural and urban populations is a federal priority (Agency for Healthcare Research and Quality, 2011). Given the immense cost and extensive harm of associated with underage drinking (e.g., Centers for Disease Control and Prevention, 2004; Knight et al., 2002; NIAAA, 2007; O'Malley & Johnston, 2002a; Pacific Institute for Research and Evaluation, 1999) and the presence of effective interventions (e.g., Carey et al., 2007) it is necessary to seek out methods to increase the access to these services in rural populations.

Telecommunications Interventions

One method of expanding access to treatment is through utilizing technology to bridge the gap between the client and treatment provider. Telehealth is the provision of any health care service over a telecommunications system such as a television, telephone, or computer (Perednia & Allen, 1995) which may include videoconferencing, email, chat rooms, or virtual environments (DeLucia, Harold, & Tang, 2013). Telehealth is also defined as "the use of advanced telecommunications to provide access to assessment, diagnosis, intervention, consultation, supervision, education, and information to underserved populations and isolated practitioners" (pp 144, Nickelson, 1996). Thus, telehealth may be viewed as a method to either provide direct services or to facilitate the provision of better service.

Telehealth provides clinicians with the ability to provide services to rural areas, unsafe areas (e.g., prisons, war zones, disaster areas), increase access for those who are disabled or will not travel due to an anxiety disorder, and improves treatment outcomes (Backhaus et al., 2012; Campos, 2009; Harwood et al., 2011). It also provides rural clinicians with access to consultation and training opportunities with more knowledgeable providers (Puskin, 1995; Webber-Serifini, 1996). Clinicians are able to reduce travel time and serve more clients through telehealth than traditional face-to-face interventions (Schopp, Demiris, & Glueckauf, 2006). Additionally, telehealth interventions oftentimes save the clients time and may be less cost prohibitive than other forms of therapy (Harwood et al., 2011). Moreover, clients are able to receive the therapy by qualified health professionals while remaining in their familiar supportive environment (Healy, Sharman, & Lokuge, 2006). Telehealth may be utilized in addition to face-to-face therapy, such as through

telephone or internet client check-ins, or may be utilized as the primary form of treatment (Emmelkamp, 2006; Harwood et al., 2011).

History of Telehealth

Empirically supported telehealth interventions utilizing the telephone began in the 1960s and were conducted by the Veterans Administration (VA), which is currently one of the top providers of telehealth services (Godleski, Nieves, Darkins, & Lehmann, 2008). Around this time, the VA also pioneered the use of computer systems to facilitate the transmission of health information from a primary care physician to a specialist (Schopp et al., 2006). The University of Nebraska School of Medicine was also a pioneer of telehealth technology; in 1964, they began utilizing a closed circuit television system to provide services to the rural Norfolk Regional Center (Benshoter, 1967). Many similar programs were conducted in the late 1960s into the 1970's; however, these programs were discontinued in the late 1970s due to high costs and limited integration into practice (Nickelson, 1996).

The increased accessibility of the internet and rising health care costs sparked a resurgence of interest in telehealth in the early 1990s (Nickelson, 1996) with over 100 million dollars being allotted for government telehealth expenditures in the 1994-1995 fiscal year (Puskin, 1996). Around this time, telehealth-assisted treatment became commonplace in many treatment locations including prisons and hospitals (Nickelson, 1996), and in providing mental health services, such as medication management and crisis intervention (Office of Rural Mental Health Research, 1995).

Videoconferencing Modality of Telehealth

While there are many modalities associated with telehealth, the primary modality of focus for the current discussion is that of videoconferencing. Videoconferencing describes

an intervention in which both the client and therapist are not in the same room, but can see and hear each other in real time through a video screen, speaker, and microphone (DeLucia et al., 2013). Examples of computer software applications that may facilitate such an interaction are Skype, Polycom, LifeView, Jabber Video, e-Getgoing, and Vidyo. When used in practice, videoconferencing systems are typically set up in mental health clinics of the provider and consumer, with paper copies of treatment materials (e.g., handouts, assessments, questionnaires) being faxed from one location to another (Gros et al., 2013). An alternative method is to provide home-based care in which the provider is at a hospital or mental health clinic and the client is at his or her place of residence with a wired internet connection (Sorocco, Bratkovich, Wingo, Qureshi, & Mason, 2013).

Comparisons of videoconferencing to face-to-face interventions have been examined for anxiety disorders, eating disorders, mood disorders, and addictions, with evidence of mixed findings. Outcome measures for videoconferencing studies tend to include pre and post treatment symptoms, therapeutic alliance, and overall client satisfaction with the telehealth intervention (e.g., Cowain, 2001; Himle et al., 2006; Pelletier, 2003). More specifically, many studies, but not all, demonstrate equivalence of effectiveness between face-to-face and videoconferencing modalities (Frueh et al., 2007; Gros et al., 2013; Himle et al., 2012; Morland et al., 2010; Morland, Pierce, & Wong, 2004). Among the ones that do not show equivalence, a few studies document evidence of greater symptom reduction from the telehealth condition as compared with in-person conditions (Bouchard et al., 2004; Nelson, Duncan, & Lillis, 2003). In addition, some evidence shows that attrition rates are higher in the in-person than telehealth conditions (Frueh, Henderson, & Myrick, 2005;

Morland et al., 2004), suggesting that telehealth may be a way to keep more individuals in the full course of therapy.

One concern of the mix findings in the telehealth interventions is that many of the prior studies have small sample sizes ($N < 40$). The sample size issue is of particular concern given evidence that in-person treatment was more effective than the telehealth treatment in studies with larger sample sizes (Gros, Yoder, Tuerk, Lozano, & Acierno, 2011; Mitchell et al., 2008). While Gros and colleagues (2011) suggest other reasons for their results, such as lack of random assignment or stronger than average in-person treatment effect, future work should aim to enroll larger samples to ensure adequate power to detect differences. Consistent with this recommendation, the researcher sought to recruit a sample with sufficient power.

Videoconferencing Telehealth for Addictions

While the majority of the telehealth research has been conducted on anxiety disorders (Gros et al., 2013) several studies have examined the effectiveness of these interventions for addictions. Frueh and colleagues (2005) conducted a study examining the effectiveness of an eight session relapse prevention group for alcohol delivered via videoconferencing versus the traditional in-person modality. Their results indicated that the telehealth intervention was equally effective, with high satisfaction ratings, high treatment credibility ratings, good attendance, and maintained abstinence in all but one client (Frueh et al., 2005). King and colleagues (2009) conducted a similar study comparing group home-based videoconferencing treatment and found similar results for a group telehealth intervention for illicit drug users. Additionally, participants reported higher satisfaction with the telehealth intervention, describing it as convenient as well as a novel and fun experience (King et al.,

2009). Another videoconferencing intervention for alcohol abusers is currently in the works, but no outcome data have been reported at this time (Staton-Tindall et al., 2012). Videoconferencing telehealth has also demonstrated effectiveness for smoking cessation as well as feasibility in reaching rural populations (Carlson et al., 2012).

Telehealth and College Student Alcohol Interventions

Even though telehealth modalities were used early on in many other mental health venues, applying these modalities to alcohol abuse and college students was far behind. It was not until the late 1990s that researchers began examining web-based data collection and intervention in college student alcohol use and associated risk factors (McCabe, Boyd, Couper, Crawford, & D'Arcy, 2002; Skinner, Maley, Smith, Chirrey, & Morrison, 2001). In 2002, McCabe and colleagues (2002) determined that college students were more likely to respond to web-based assessment than mailed pen and paper assessments and that web-based assessment led to a more representative sample. As reviewed in the brief intervention section, over a period of ten years, web-based assessment and intervention became the norm for college alcohol use (e.g., Cunningham, 2011).

Despite the popularity of online only interventions, there are inconsistencies regarding how effective online interventions are when compared to face-to-face interventions. Some researchers indicate that computer-based alcohol interventions may be as effective as face-to-face interventions in college students (Kypri et al., 2004) while others have determined that face-to-face BMIs are more effective for multiple outcomes and have longer lasting results (Amaro et al., 2009; Carey et al., 2010; Carey, Henson et al., 2009). Additionally, gender differences are present in the effectiveness of face-to-face versus online interventions in that male students perform equally well in short-term follow-ups in either

condition, whereas females respond better to face-to-face interventions (Carey et al., 2010; Carey, Henson et al., 2009). Thus, there is significant evidence to support the need for telehealth interventions that are more similar to face-to-face interactions.

Legal and Ethical Concerns of Videoconferencing Therapy

Despite many of the benefits of telehealth interventions, these interventions raise several ethical and legal considerations. One area of concern is maintaining client privacy and confidentiality (David, Karen, & Hon, 2009), which can be achieved through utilizing telehealth software with high encryption settings (Gros et al., 2013). Some researchers argue that telehealth interventions, particularly for alcohol abuse, actually improve confidentiality and reduce stigma (Baca et al., 2007). This is consistent with reports from illicit drug users preferring videoconferencing to in-person for the ease of use as well as confidentiality (King et al., 2009).

An additional consideration is that clients should be well-informed of the risks and benefits associated with the teleconferencing modality and be made privy to other types of available treatment (Barnett & Scheetz, 2003). This can be achieved through a thorough informed consent procedure which also addresses legal limits of confidentiality and information about the handling of emergencies or crisis situations (Barnett & Scheetz, 2003). Whenever possible, informed consent forms should be completed in-person to maintain adherence to policies set by IRBs and similar research communities (Gros et al., 2013). Additionally, practitioners need to pay close attention to jurisdiction, as licensure is required in the state that the client is receiving treatment (Barnett & Scheetz, 2003; Harwood et al., 2011).

Teleconferencing Therapy Process Concerns

Several researchers have raised concerns regarding whether or not the therapy process conducted in telehealth interventions is equivalent to that achieved during face-to-face contact (Barnett & Scheetz, 2003; Day & Schneider, 2002; DeLucia et al., 2013; Harwood et al., 2011). Some of these concerns include difficulty viewing non-verbal signals such as gestures, body language, and less eye contact. These viewing challenges may negatively impact the interaction (Fussell & Benimoff, 1995; Gros et al., 2013; Harwood et al., 2011). Moreover, Suwita and colleagues (1997) reported a finding that videoconferencing interactions appear less open, more reserved, and the client or therapist is viewed as being distant. Several recommendations to minimize problems related to the videoconferencing modality include talking more slowly, taking turns speaking, and asking more direct questions to make up for gesture recognition (Gros et al., 2013).

Therapeutic Alliance

The therapeutic alliance is believed by many to be one of the best predictors of treatment outcome (Orlinsky, Ronnestad, & Willutzki, 2003). While the concept of therapeutic alliance originated in the psychoanalytic orientation, Bordin (1979) responded to a proliferation of different types of therapy by indicating that the therapeutic alliance is the most important determinant of treatment success. He proposed a model of the therapeutic alliance that is consistent with many therapeutic orientations. Specifically, Bordin (1979) describes the therapeutic alliance as consisting of the level of agreement on the goals of therapy, agreement on the tasks conducted to attain therapy goals, and a general bond of trust and attachment. He also notes that the strength of the therapeutic alliance may be an

indicator of the goodness of fit for the provision of a specific theoretical orientation by that therapist for that particular client. In this section, the author reviews the effect of therapeutic alliance on treatment outcome, particularly in brief interventions with college students. The impact of telehealth interventions on the therapeutic alliance is also explored.

Therapeutic Alliance and Treatment Outcome

In the years since Bordin's proposed model of therapeutic alliance, numerous studies have been conducted on the influence of the therapeutic alliance on the outcome of therapy. A meta-analysis comparing the effect of the therapeutic alliance across a wide range of treatment types determined that the therapeutic alliance has a moderate effect ($r = .22$) on treatment outcome (Martin, Garske, & Davis, 2000). In regards to alcohol abuse populations, the therapeutic alliance has been determined to be an inconsistent predictor of treatment outcome, with many other factors having more consistent and stronger predictive power (Meier, Barrowclough, & Donmall, 2005). Nevertheless, a variety of studies have determined that the strength of the therapeutic alliance positively impacts alcohol treatment outcome (Crits-Christoph et al., 2011; Dundon, Pettinati, & Lynch, 2008; Ilgen, Tiet, Finney, & Moos, 2006). More specifically, the therapeutic alliance demonstrated significance as an outcome predictor among those receiving typical outpatient treatments, but not those in aftercare treatments (Connors et al., 1997). Overall, it appears that the therapeutic alliance may have some influence in alcohol interventions, but other factors generally have more influence on the therapy outcome.

Mixed research also exists regarding the effect of the therapeutic alliance in college students. Some research has determined that the therapeutic alliance has a positive influence on outcomes in college students (Eyler, Gaskins, & Chalk, 2009). Other alcohol-specific

research in college students failed to find any predictive utility of therapeutic alliance in a Motivational Interviewing intervention (Feldstein & Forcehimes, 2007). The amount that treatment alliance plays into brief motivational interventions is less known. Some researchers determined that the therapeutic alliance is a predictor of some outcomes following a brief, four session alcohol treatment, but other predictors had stronger effects (Richardson, Adamson, & Deering, 2012). Bordin (1979) posits that the bond created in therapy may be less important if the relationship is only going to last a few months or less. The results of one brief motivational intervention with college students determined that the participant could meet with a different therapist at time one and time two, with no detriment to treatment outcome (Short, Fernandez, Borsari, Hustad, & Wood, 2011). However, in another study examining a two session MI intervention with college students, the intervention was demonstrated to increase therapeutic alliance compared to an assessment and information only condition (Bolger et al., 2010). Thus, the effect of therapeutic alliance for brief alcohol interventions in college students remains relatively unknown.

Therapeutic Alliance and Videoconferencing Telehealth

The development of the therapeutic alliance may be hindered in videoconferencing interventions due to a negative impact on communication (Manning, Goetz, & Street, 2000) such as being unable to view gestures, non-verbal signals, or eye contact (Gros et al., 2013). Many psychologists report a belief that the therapeutic alliance will be negatively impacted by a videoconferencing intervention (Rees & Stone, 2005). Specifically, the therapeutic alliance may be negatively influenced by the perception of distance (Bradner & Mark, 2002). The term presence is utilized in telehealth to identify how much the interaction feels like the client is actually there in the same location as the therapist (DeLucia et al., 2013). Presence

is impacted by the ease of system use, viewing modality, and client age, with younger individuals experiencing more presence (DeLucia et al., 2013). Greater presence predicts outcomes such as effectiveness, user acceptance, and better overall experience (Stanney & Cohn, 2006). While therapists and clients alike view teleconferencing as a potential hindrance to the development of the therapeutic alliance and subsequently the outcome of therapy (Swinton, Robinson, & Bischoff, 2009), the previous review of the telehealth literature determined that equivalent effectiveness and satisfaction was the norm. Studies that have explicitly evaluated the effect of videoconferencing on the therapeutic alliance have determined no significant differences between the videoconferencing and face-to-face conditions (Bouchard et al., 2004; Germain, Marchand, Bouchard, Guay, & Drouin, 2010; Ghosh, McLaren, & Watson, 1997; Manchanda & McLaren, 1998). Thus, more research must be conducted to determine whether the therapeutic alliance does indeed influence the treatment outcome in a brief alcohol intervention conducted via telehealth.

Description of Current Study

The purpose of the current study was to examine an empirically supported brief intervention for college students when delivered through a teleconferencing system versus the typical face-to-face intervention. Several specific aims are addressed within the study.

Aim 1: Test the hypothesis that the teleconferencing intervention is equivalent in effectiveness to the face-to-face intervention. Aim 1 is focused on replicating the finding present in other empirically supported treatments for substance abuse problems in that the teleconferencing intervention is equivalent in effectiveness to the face-to-face intervention (Frueh et al., 2005; King et al., 2009). This was assessed by taking a measurement of alcohol

use and problems prior to the intervention and at three post-intervention time points. Changes in alcohol consumption and problematic drinking were examined at one, two, and three months post-intervention. These time points are important to examine as prior research has determined that online brief alcohol interventions may predict different outcomes at short-term (5 weeks or less) follow up than long-term (greater than five weeks) follow ups (Carey, Scott-Sheldon et al., 2009). The trajectories of change following the intervention were examined and no differences were anticipated between the two conditions. Participants from the telehealth and face-to-face intervention were expected to report a significant decrease in problematic drinking from the pre-intervention baseline time point to the one month follow up point. They were also expected to maintain that change at two and three months post-intervention time points.

Aim 2a) Determine whether the hypothesis that therapeutic alliance changes significantly between session one and session two is correct. Prior research has determined that the therapeutic alliance did change significantly between two sessions of a brief intervention in college students (Bolger et al., 2010). Thus, the research expected a replication of the growth of therapeutic alliance between the two sessions.

Aim 2b) Replicate the findings in prior literature which find no difference in therapeutic alliance between face-to-face and videoconferencing conditions. A multitude of researchers expressed concern regarding the factors which may affect the therapeutic alliance in the telehealth condition, but these concerns are not supported by research (e.g., Gros et al., 2013). A review of prior literature demonstrates no significant differences in therapeutic alliance in videoconferencing versus face to face conditions (Germain et al., 2010) thus no difference was expected.

Aim 2c) Test the hypothesis that the strength of the therapeutic alliance will have a small influence on the treatment outcome. The findings are mixed regarding whether or not the therapeutic alliance has an impact on alcohol interventions in college students, with some positing a small positive effect on treatment outcome (Eyler et al., 2009; Richardson et al., 2012) and others indicating no impact (Feldstein & Forcehimes, 2007). Based on this information, the strength of the alliance was expected to have a small effect on treatment outcome.

Aim 2d) Test the hypothesis that the predictive power of therapeutic alliance on treatment outcome will not differ by condition. Given the results of prior research discussed above, no interaction was expected between therapeutic alliance and group, thus the influence of therapeutic alliance on outcome was expected to be equivalent across conditions.

Aim 3a) Determine if the hypothesis that satisfaction will be equivalent across groups is correct. The third aim was to assess the participant experience in the telehealth condition compared to the face-to-face intervention. As prior research supports equivalent satisfaction ratings in the face-to-face and videoconferencing conditions in substance use interventions (Frueh et al., 2005; King et al., 2009), it was expected that there would be no significant differences in satisfaction ratings.

Aim 3b) Test the hypothesis that satisfaction ratings will positively predict treatment outcome. Additionally, satisfaction with treatment was anticipated to impact treatment outcome. Specifically, regardless of condition, those who report higher satisfaction scores were expected to exhibit the greatest decline in problematic drinking from pre-treatment to 1 month post treatment and maintain treatment gains.

Aim 4): Determine whether the hypothesis that participants in the telehealth condition will have high presence ratings holds true. The experience of the participants in the telehealth condition was rated with an additional measure specifically related to the telehealth experience. As the participant population is composed of college students and younger individuals are more amenable to experiencing presence (DeLucia et al., 2013), it was expected that the participants will be comfortable with technology and would report feeling like the interaction is very similar to a face-to-face conversation.

Aim 4b): Identify if the hypothesis that telepresence ratings do not impact treatment outcome is supported. With this aim, the researcher sought to determine whether or not the participants rating of overall presence in the telehealth condition impacted treatment outcome. Despite prior researchers indicating that interactions that most closely resemble face-to-face interaction are ideal, prior research does not support any differences in outcome based upon telehealth or face-to-face modalities (Gros et al., 2013). Thus, telepresence was not hypothesized to have an effect on the outcome of this study.

Chapter 2: Method

Participants

The participants consisted of 51 ($M = 19$ years; 39.2% Male) undergraduates from a large Mid-Western University. Participants were recruited through Sona, a participant recruitment program that provides credit for participation in research. Participants were presented with a short description of the research and self-selected to participate in the study. To be eligible for participation, participants must have attended the Mid-Western University and indicated that they had engaged in binge drinking within the last two weeks (prior to

study registration). Consistent with recommendations by Wechsler and colleagues (2000), binge drinking was defined on the study description as five or more drinks in a row for men or four or more drinks in a row for women in the two weeks preceding self-selection for participation in the study.

Undergraduates who did not meet binge drinking criteria or have previously participated in in-person BASICS were excluded from participation in the study. All participants were age 18 or over and were able to consent to the study independently per the institution's IRB. Individuals who completed the on-campus Alcohol Skills Training Program online assessment and intervention were allowed to participate in the study; however, no participants met these criteria.

Measures

Several types of measures were included in the study, which assessed a variety of characteristics about the participant including general demographic characteristics, emotional health, and problematic alcohol use. Process variables were also examined including participants rating of the therapeutic alliance, satisfaction with the intervention, and general satisfaction with the therapeutic experience.

Demographics Questionnaire. General participant information was collected through a questionnaire asking basic questions regarding age, gender, race, and ethnicity. Additionally, family related variables, such as type of family, family income, and family history of emotional, legal, and drug problems was included. Variables related to the college experience including residence, Greek status, GPA, and major were also assessed. Moreover, general questions about any past mental health diagnoses, current medications,

and legal problems (e.g., DUI, MIP, possession) were also included in the demographics section.

   Internet Usage Questionnaire (IUQ). The IUQ is an unpublished measure under development by Bautista, Roma, and Hope (in prep) to measure an individual's level of comfort with the internet and what the individual uses the internet for. The IUQ assesses areas such as the frequency of use, amount of time on it, and the type of activities engaged in while using it. For the purposes of this study, descriptive statistics were calculated to determine how often the participant utilizes the internet, how much time the participant generally spends online, and how often the participant engages in activities similar to the telehealth condition (i.e., videochatting).

Substance Use Related Measures – For Present Study

   Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). The AUDIT was utilized as a time-varying outcome measure in the current study. The AUDIT is a 10-item brief assessment to screen for problematic and excessive drinking. An individual responds using a 5-point Likert scale format to each of the ten AUDIT items. The questions measure frequency of behaviors with 0 = "Never" 1 = "Less than Monthly" 2 = "Monthly" 3 = "Weekly" and 4 = "Daily or Almost Daily," as well as quantity of drinks in which 0 = "1-2" 1 = "3-4" 2 = "5-6" 3 = "7-9" and 4 = "10+" or questions regarding whether something has occurred with a response format of 0 = "No" 2 = "Yes, but not in the last year" and 4 = "Yes, during the last year." These responses are then added up to obtain an overall AUDIT score (range 0-40). The AUDIT has been shown to outperform several other measures in identifying problematic drinkers (Kelley et al., 2002). The scale is demonstrated to have

acceptable to good internal consistency, with αs ranging from .72 to .81 in college student populations (Fleming et al., 1991; Kokotailo et al., 2004; Shields et al., 2004). In this sample, α for AUDIT was .734. The Intra-Class Correlation (ICC) coefficient of .84 to .92 shows good test-retest reliability for the AUDIT (Reinert & Allen, 2002; Selin, 2003). Additionally, the AUDIT is suggested to have a two factor structure, with questions loading on either alcohol consumption or associated consequences (Maisto et al., 2000; Shields et al., 2004).

Developers indicate a cutoff score of 8 to identify individuals who are likely to have significant problems with alcohol use (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). However, more recent research indicates that a cutoff score of 8 lacks sensitivity and has high specificity in some populations, most notably women (Cherpitel, 1998; Reinert & Allen, 2002) and some even suggest that an AUDIT score above zero is indicative of problematic drinking for women (Welcome & Pereverzev, 2011). Low sensitivity has also been observed in male college student populations (Kokotailo et al., 2004) and several studies recommend lowering the cutoff score for men somewhere between a five and seven (Dybek et al., 2006; Gache et al., 2005; Gual et al. 2002) to arrive at preferred sensitivity (.97 to .86) and specificity (.84 to .74) values. Recommendations for cut-off values for identifying high-risk drinking in college students also suggest five (Adewuya, 2005) with sensitivity at .94 and specificity of .92 or six (Kokotailo et al., 2004) with sensitivity .91 and specificity of .60. Taking into account the recommendations from prior studies, the problematic drinking cutoff of six was utilized in this study for both male and female participants.

Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989). The RAPI was utilized as another time-varying outcome measure for the present study. It is a 23-item

assessment which evaluates the frequency that problems associated with the consumption of alcohol occur over a specified time period. The RAPI is identified as having good test-retest reliability (α = .92-.93 and .89-.92; White & Labouvie, 1989; Miller et al., 2002) and has been extensively used in college students as a measure of treatment outcome (e.g., Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Borsari & Carey, 2000; Herschl, McChargue, MacKillop, Stoltenberg, & Highland, 2012; Meyers et al., 2013; Murphy et al., 2004; Neighbors, Larimer, & Lewis, 2004). In the present study, the alpha reliability for the RAPI measure was .873. Neal, Corbin, and Fromme (2006) describe the RAPI as having validity for use in college students and indicate that a score of eight or greater suggests the presence of significant problems related to alcohol for which intervention is recommended. Thus, for the purposes of this study, a RAPI cutoff score of eight was utilized.

Substance Use Related Measures – Included for BASICS Intervention

Modified Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). The DDQ was added to the study to provide an additional measure of alcohol use. The DDQ serves to collect basic information regarding the participants drinking pattern over a typical week as well as the most the participant has drank over the last month. This questionnaire is demonstrated to have high reliability (r = .90) and good convergence with similar items (Turrisi, 1999). Additional questions were added to this measure including questions about family risk, drunk driving, and perceived drinking norms.

Comprehensive Effects of Alcohol (CEA; Fromme, Stroot, & Kaplan, 1993). The CEA is a questionnaire that measures the participants expectations of what will happen when he/she is under the influence of alcohol and whether or not this effect is good or bad. For each of thirty eight questions, the participant rates whether they agree or disagree that an

effect will happen utilizing a four point Likert scale in which 1 = "Disagree" and 4 = "Agree." The participant also rates how they view this effect, from 1 = "Bad" to 5 = "Good." For the purposes of this study, the CEA was not scored, rather, the information was utilized as feedback to the participant.

Readiness to Change Questionnaire (RCQ; Rollnick, Heather, Gold, & Hall, 1992). The RCQ is a 12-item brief assessment to determine what stage of change an individual is in, corresponding with Prochaska and DicLemente's (1986) stage of change model. These questions are aimed at whether or not the participant views his/her alcohol use as a problem and whether he/she is ready to consider change at this time. The participant responds using a 5-point Likert scale format answering questions regarding level of agreement with statements, with -2 = "Strongly Disagree" -1 = "Disagree" 0 = "Unsure" 1 = "Agree" and 2 = "Strongly Agree." Rollnick and colleagues (1992) determined that the scale has good internal consistency (α = .73 - .85) and reliability (.78 - .86). The RCQ can be utilized either to place individuals into a readiness to change category (pre-contemplation, contemplation or action) as well as be summed after reverse coding the pre-contemplation items in order to obtain a total readiness to change score, with higher scores being more ready to change (Miller, 1999). Moreover, this measure is frequently utilized in college student populations and is utilized as a standard to compare other measures to (Harris, Walters, & Leahy, 2008). The RCQ was not directly utilized in the analyses for the study. It was utilized in the creation of feedback packets for participants to provide them with information on where they stood in regards to stage of change as well as to provide therapists with the participant's readiness to change.

Importance and Confidence Ruler (ICR; Williams, Horton, Samet, & Saitz, 2007). The ICR is generally regarded as one instrument; however, it has two different components measuring importance to change and confidence in ability to change. The importance to change ruler states "On a scale of 1 to 10, how important is it for you right now to make a change in your drinking?" The confidence in changing ruler states "On a scale of 1 to 10, how confident are you that you could make this change?" In both of these rulers, 1 is the least important or confident while 10 is the most important or confident. The importance and confidence rulers are moderately correlated with stage of change, AUDIT scores, RAPI scores, and other risk variables (Harris, Walters, & Leahy, 2008).

Substance Use Questionnaire (SUQ) The Substance Abuse Questionnaire is a non-specific measure designed to collect basic information regarding the participant's use of a variety of substances. This questionnaire asks about the frequency of substance use other than alcohol, including nicotine, marijuana, prescription stimulants (e.g., Adderall), K2, and other street drugs.

Feedback Quiz (FQ). The Feedback quiz is a non-standardized measure developed to ensure that the participant thoroughly reviews the feedback packet. This measure consists of twelve questions that can be answered by looking through the feedback packet. For a participant's data to be utilized in the study, they must have answered at least 70% of the questions correctly.

Therapy Process Measures

Motivational Interviewing Treatment Integrity Code (MITI; T. Moyers, Martin, Manual, & Miller, 2003). The MITI is a brief instrument designed to assess the consistency of the therapist's adherence to the motivational interviewing treatment. The MITI is

demonstrated to have good discriminant validity in determining MI-consistent versus inconsistent behaviors and has high reliability (Moyers, Martin, Manual, & Miller, 2003). This measure is utilized by taking a random twenty minute segment of a therapy session and rating on a scale from 1 to 5 the quality of MI consistent behaviors including evocation, collaboration, autonomy/support, direction, and empathy (Moyers, Martin, Manual, & Miller, 2003). An additional section of the MITI tracks the frequency and quality of different MI adherent and non-adherent behaviors (Moyers, Martin, Manual, & Miller, 2003). The purpose of using this measure in this study was to ensure that the therapists were providing the intervention in an MI-consistent manner.

Working Alliance Inventory- Short Revised (WAI-SR; Hatcher & Gillaspy, 2006). The WAI-SR is a 12-item self-report measure that provides a measure of the strength of the therapeutic alliance. It is based upon the original 36-item measure by Horvath and Greenberg (1986) and maintains three subscale measures of alliance including the affective bond and agreement on the tasks and goals of therapy. Each of the twelve items is assessed on a five point Likert scale from 1 = "never" to 5 = "always." The WAI-SR scale and subscales have αs ranging from .80 to .90 as well as a good CFA model fit (Munder, Wilmers, Leonhart, Linster, & Barth, 2010). The WAI-SR reliability for this study was consistent with that found in prior studies, with αs of .934 (face-to-face) and .935 (telehealth). Additionally, the WAI has been utilized to compare the working alliance built in face-to-face versus telehealth interventions in prior studies (e.g., Germain et al., 2010). The WAI-SR was utilized as a measure of the therapeutic alliance in both treatment conditions. While there is both a client and therapist version, for the purposes of this study

only the client version was utilized. The data for the WAI were centered at the mean to facilitate ease of interpretation in the model.

Client Satisfaction Questionnaire (CSQ-8; Attkisson et al., 1989; Larsen, Attkisson, Hargreaves, & Nguyen, 1979) The CSQ is a brief, eight item instrument which provides a measure of overall satisfaction with the provided treatment. Questions are answered on a four point Likert scale in which 1 is most negative and 4 is most positive, with scores ranging from 8 to 32 in which higher scores indicate greater satisfaction. The CSQ is reported to have αs ranging from .85 to .93, a consistent factor structure (Larsen et al., 1979), and good concurrent validity (Sabourin et al., 1989). The CSQ-8 reliability for this study was consistent with that found in prior studies, with αs of .822 (face-to-face) and .872 (telehealth). For the purposes of this study, the CSQ-8 was administered to both groups to determine whether differences in satisfaction are present. Additionally, the CSQ-8 was centered at the mean to facilitate interpretation.

Temple Presence Inventory (TPI; Lombard, Ditton, and Weinstein, 2009). The TPI is a 42-item measure of telepresence which measures how similar to face-to-face interaction the telehealth interaction feels to the participant. The items are ranked on a Likert scale from 0 to 7 with 0 standing for Not at all, Never, Not Well, or a low presence environment (e.g., movie screen), while 7 indicated Very Much, Always, Very Well, or a high presence environment (e.g., like a window). The scale is composed of eight subscales which assess spatial presence, social presence- actor within medium, social presence – passive interpersonal, social presence – active interpersonal, engagement (mental immersion), social richness, and social realism. The authors identify alpha reliabilities ranging from .75 to .93 within the subscales. In the present study, alpha reliability for TPI was .948 for the overall

scale. While the literature identifies the mean level of presence among viewing situations expected to be "low presence" versus "high presence," no specific cutoffs have been determined to differentiate high versus low presence in novel conditions. The TPI was utilized to determine how similar to a face-to-face interaction the participants felt their experience was. The TPI was centered at the mean for use as a predictor of treatment outcome.

Procedures

The research study received approval from the university IRB. Study recruitment was conducted through the Sona experimental system, which awarded course credit for participation in research. The description indicated that binge drinking within the last two weeks was a requirement for participation in research. The participants were informed that a portion of the research would include online assessment and another portion would include in-person participation. Participants read a brief description of the study and electronically signed a consent form to participate in the research (see appendix). Upon signing up for the study, the participants were matched to condition by gender to reduce potential confounds (DiFulvio, Linowski, Mazziotti, & Puleo, 2012).

Assessment Procedures

All study-related assessment was conducted on-line. On-line administration of alcohol-related survey materials has been demonstrated to be an effective method of obtaining this information from college students (Kypri, Gallagher, Cashell-Smith, 2004; Thomas & McCambridge, 2008). The assessments were conducted utilizing Qualtrics which was configured to send the responses directly to a database. Qualtrics uses Transport Layer

Security encryption, maintains encryption for collected data, and all servers are protected by a firewall. The data were downloaded to a secured ftp file on an on-going basis.

Participants completed assessment measures at pre-intervention, following sessions one and two, and at one, two, and three months post-intervention. Prior to beginning a treatment condition, participants completed a series of questionnaires online, which took between 30 and 40 minutes on average. Refer to Table 2.1 for a list of the assessments that occurred at each time point. A detailed description of the questionnaires can be found in the measures section.

Videoconferencing Equipment

The videoconferencing took place utilizing two computers with a wired internet connection in separate rooms. While videoconferencing interventions have utilized screens as small as 8 inches (Staton-Tindall et al., 2012), the computers utilized in this study had screens of at least a 19" diagonal in order to provide the most realistic view and allow for more subtle non-verbal communication recognition (Gros et al., 2013). The intervention was conducted utilizing the Polycom software that provides a secure, encrypted, high quality connection. Bandwidth is also an important consideration, with slow modem speeds (128kbit/s) causing visual and audio disruptions (Gros et al., 2013). Prior studies have utilized a bandwidth of 384 kbit/s (Frueh et al., 2005) which led to high patient satisfaction ratings and treatment credibility, thus the treatment was conducted at a bandwidth at least equal to 384 kbit/s. Participants who were randomized to the telehealth condition received basic training by a research assistant in regards to operation of the telehealth program including starting up, shutting down, and basic troubleshooting. Consistent with

recommendations from prior research, the research assistant remained outside of the room during the session to be available in case of any equipment problems (Gros et al., 2013).

Face-to-Face and Videoconferencing Procedures

Participants were randomly assigned to either the face-to-face or telehealth condition and matched by gender following the participants' registration for a particular date and time. Two lab spaces were reserved for the study, each equipped with a computer connected to the internet. Each room was private, quiet, minimally furnished and free of visual distractions, consistent with recommendations (Gros et al., 2013). Both face-to-face and telehealth condition participants attended in the same location; however, only the face-to-face participants had in-person interaction with the therapist at any time. To maintain consistency, a research assistant greeted the participant in both conditions and provided instructions on signing an online informed consent as well as gave them a paper printout. The participant attended two 50-60 minute sessions that occurred approximately one week apart. Following each session, the participant completed several measures regarding their in-session experience including the WAI-SR, CSQ-8, and the TPI in the telehealth condition.

Therapists

The therapists were doctoral students who completed a graduate level course in motivational interviewing techniques. Additionally, the therapists had experience providing the BASICS intervention under live supervision to at least one prior client. Each session was audio recorded in order to facilitate coding of treatment consistency with the MITI. Two research assistants utilized the MITI to evaluate twenty percent of each therapist's sessions for treatment adherence and MI consistency.

BASICS Intervention

The intervention was the Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff et al., 1999). This intervention includes both motivational enhancement and alcohol education components and was conducted in accordance with the treatment manual. The therapist ensured that all participants were provided with the opportunity to discuss each of the main topics in a motivational interviewing consistent manner; however, given individual differences the amount of time spent on each topic varied.

Session one included a brief discussion of alcohol consumption including drinking patterns, typical drinking setting, frequency of drinking, and amount typically consumed in one setting. Some education was provided on alcohol, including defining one standard drink, setting limits, and tracking drinks. Additionally, family variables such as familial risk factors, acceptance of drinking, and status of relationships were discussed. Moreover, expectations related to drinking were identified and pros and cons of drinking were weighed. Towards the end of the session, the participant was instructed to complete a monitoring sheet over the next week. Additionally, the participant was challenged to cut drinking in half between now and the next visit. Methods of tracking drinks were reviewed and the therapist ensured that the participant selected a strategy.

Session two of the BASICS intervention is predominately a feedback and planning session. The participant received a paper version of the feedback packet from the RA. As telehealth treatments often employ use of a fax machine, receiving the feedback packet in this manner was a realistic expectation and maintained consistency between both conditions. The feedback packet was a compilation of information from the on-line assessment the

participant completed at the beginning of treatment as well as information gathered verbally from the first session.

The second session began with a discussion of the drinking challenge and whether or not the participant was able to reduce drinks in the manner they reported at the prior session. Reasons for success or failure were identified in a MI consistent manner. Next, the feedback packet was reviewed. Topics included the participant's substance use and perceived versus actual norms for other students at their university, family risk factors, expectations related to alcohol, effects at different blood alcohol levels, other risk factors, and their readiness to change state. The therapist provided the participants with a personalized blood alcohol chart and ensured that they were able to utilize the chart and recognize factors that influence their blood alcohol levels. Methods of risk reduction were discussed and the therapist assisted the individual in identifying which ones to implement in his or her life, if any.

At the end of the second session, the RA directed the participant to complete a feedback quiz on-line. The feedback quiz was a brief twelve-question document, which asked questions covered in the session and on the feedback packet to ensure that the participant thoroughly reviewed the information. Those in the telehealth condition completed these measures on the same computer after disconnecting with the therapist. Those in the face-to-face intervention completed these measures on the computer once the therapist exits the room.

Follow-Up Procedures

Upon completion of the second session, the participants were reminded of follow-up assessment and were notified that they would receive e-mail reminders in their mailbox that link to the web-based assessment. Consistent with prior research (Bentley & Thacker, 2004),

to minimize attrition a five dollar monetary incentive was provided to those who completed the entire study including the initial assessment, both sessions, both sets of questionnaires following the sessions, and each of the follow-up time points. Attrition rates were expected to be between 10 % and 20 %, thus it was anticipated that 40 (20/20) individuals would have complete follow-up data.

Follow-up assessments were conducted at one-, two-, and three-month post intervention.   This time period is consistent with prior research that suggests that change occurs within one month of the intervention (Carey et al., 2007). Follow-ups included approximately 15 minutes of questionnaires. See Table 2.1 for a list of which measures were completed at each time point. Participants who completed all three follow up time points were notified of their status and, consistent with the procedures utilized by the university, were mailed their monetary incentives.

Table 2.1

Methodological Process and Measures at Each Time Point

	Timeline					
Recruited	Pre-Int Baseline	Post S1	Post S2	1 Month Follow-Up	2 Month Follow-Up	3 Month Follow-Up
Face-to-Face (n = 24)	IC, Demo, IUQ, AUDIT, DDQ, RAPI, RCQ, ICR, SUQ, CEA	WAI-SR, CSQ-8, RCQ, ICR, Monitor	WAI-SR, CSQ-8, RCQ, ICR	Demof/u, AUDIT, DDQf/u, RAPI, SUQ	Demof/u, AUDIT, DDQf/u, RAPI, SUQ	Demof/u, AUDIT, DDQf/u, RAPI, SUQ
Total (N = 51)						
Tele-health (n = 27)	IC, Demo, IUQ, AUDIT, DDQ, RAPI, RCQ, ICR, SUQ, CEA	WAI-SR, CSQ-8, TPI, RCQ, ICR, Monitor	WAI-SR, CSQ-8, TPI, RCQ, ICR	Demof/u, AUDIT, DDQf/u, RAPI, SUQ	Demof/u, AUDIT, DDQf/u, RAPI, SUQ	Demof/u, AUDIT, DDQf/u, RAPI, SUQ

IC = Informed Consent, Demo = Demographics, IUQ = Internet Usage Questionnaire, AUDIT = Alcohol Use Disorders Identification Test, DDQ = Daily Drinking Questionnaire, RAPI = Rutgers Alcohol Problem Index, RCQ = Readiness to Change Questionnaire, ICR = Importance and Confidence Ruler, SUQ = Substance Use Questionnaire, WAI-SR = Working Alliance Inventory-Short Form Revised, CSQ-8 = Client Satisfaction Questionnaire, TPI = Temple Presence Inventory

Data Analysis

The majority of the data were collected via Qualtrics. As Qualtrics stores raw data entered by participants, data were checked for errors, such as repeated entries and nonsensical responses. Additionally, any remaining identifying information was removed. Data were transferred into a SAS format for analysis and all hypotheses were explored utilizing appropriate models in SAS. Figure 2.1 provides a graphical representation of the models that address study aims.

Figure 2.1

Picture Depicting Overall Model
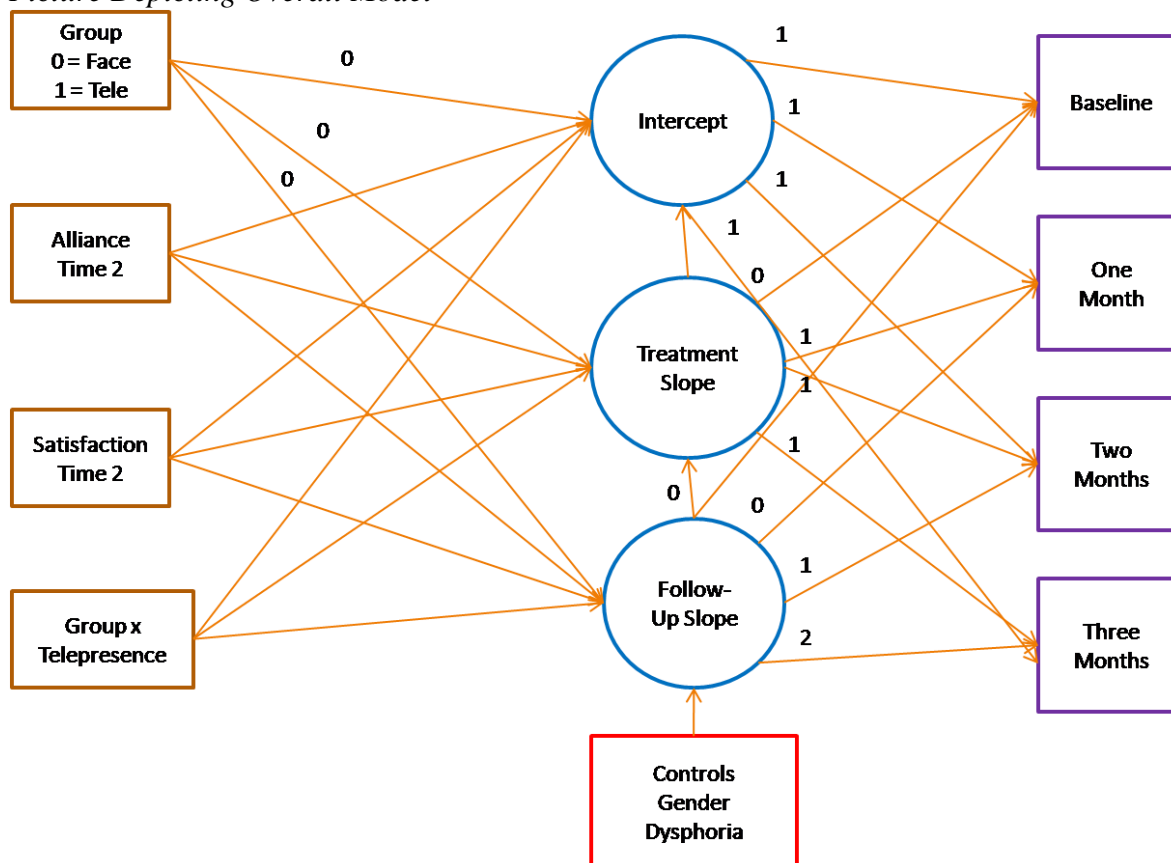
Aim 1: Is the teleconferencing intervention equivalent in effectiveness to the face-to-face intervention?

Two different outcome variables were examined: AUDIT and RAPI. Treatment was determined to be effective if the average AUDIT score decreased below the cutoff of six at any of the follow-up time points. Treatment effectiveness was also evaluated by determining whether or not the average RAPI score decreased below the suggested cutoff of eight. Moreover, any decrease in AUDIT or RAPI score was expected to maintain at the subsequent follow up points.

First, the individual trajectories were mapped for both the AUDIT and the RAPI at baseline, one, two, and three months post-treatment. It was expected that the mean AUDIT and RAPI score at the pre-intervention baseline would be indicative of problematic alcohol. Additionally, a significant decrease was hypothesized from pre-intervention to one month post-intervention, with no significant increase for the remainder of the follow-up time points. Thus, a two slope piecewise model was anticipated, with a significant negative slope from baseline to the one-month follow up and a zero slope thereafter. The model included an intercept, which identifies the mean outcome score at the time that the intercept is set at. For the purposes of this treatment study, the intercept was set at 1 month post-intervention. The model also included a treatment slope, which provided information regarding the short-term rate of change process that occurs between the baseline time point (0) and 1-month post treatment. Next, the model had a follow-up slope, which determined the rate of change between 1 month and 3 months post-treatment. However, if the AUDIT and RAPI scores appeared to follow a different trajectory, other piecewise or polynomial models would have been explored. See Figure 2.2 for an example of the anticipated trajectory for AUDIT and RAPI.

Figure 2.2

Expected Means for AUDIT and RAPI Scores
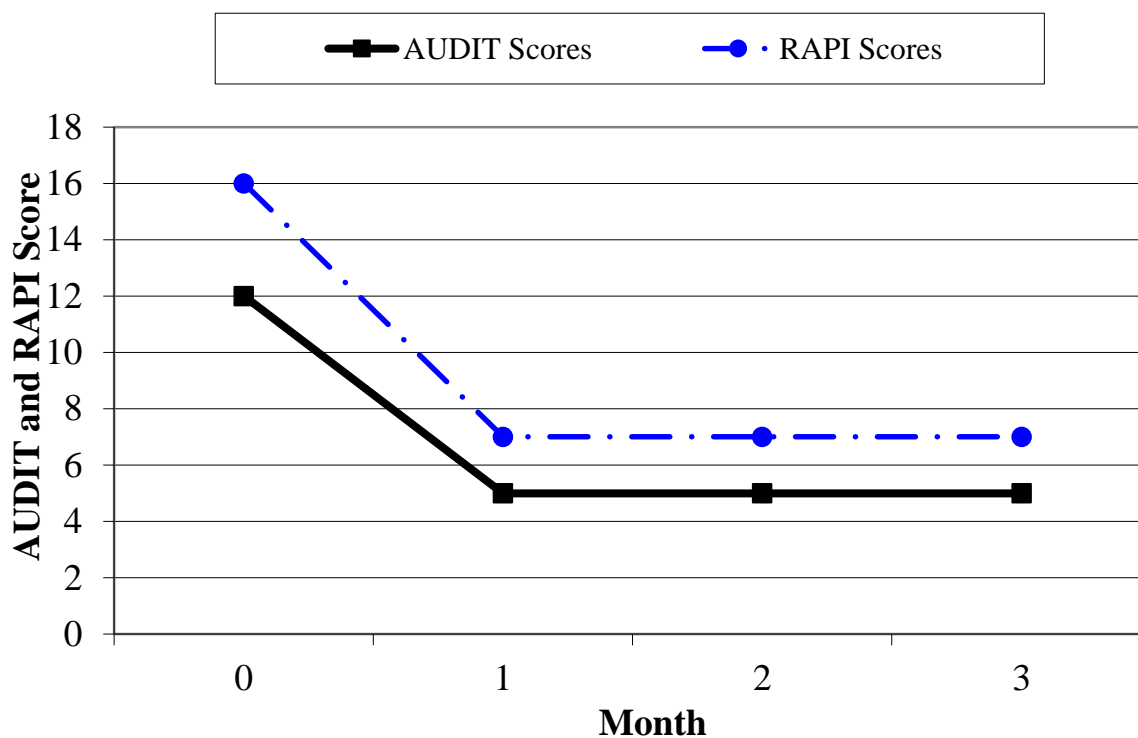
Within person change on each outcome variable over time was examined utilizing an

unconditional random effects model, centering time at the one month follow-up point to

determine whether or not significant differences are present at the first time point post

intervention. Next, fixed effects of time were examined to determine the average change in

AUDIT and RAPI score. Random effects of time were also added to determine whether

individual slopes needed to be allowed by the model. Since four time points were planned, it

was possible for both slopes to have random effects if this resulted in the best fitting model.

Model fit for nested models was examined utilizing the -2LL, AIC, and BIC criteria in which

smaller numbers are indicative of a better fitting model.

In order to determine whether or not the telehealth treatment was equivalently effective to the face-to-face intervention, treatment type (i.e., group) was added to the conditional model as a predictor. The face-to-face intervention was coded as zero and the telehealth intervention was coded as one to facilitate ease of interpretation. Fixed effects of condition were examined for the intercept, treatment slope, and follow-up slope. If any of these effects were to be significant, then there was a possibility that the treatments are statistically non-equivalent in effectiveness. However, this is independent of clinical effectiveness in that any maintained score below the predetermined cutoff would be considered a treatment success. Additionally, there was a possibility that one intervention may have longer lasting effectiveness than the other, thus all significant fixed effects were interpreted.

Aim 2a) Does the therapeutic alliance change significantly between session one and session two?

The Working Alliance Inventory – Short Form Revised (WAI-SR) was utilized as the measure of therapeutic alliance. A 2x2 Mixed Anova was utilized to determine whether the amount of change between session one and session two assessment was significant. A significant effect would mean that there is a greater amount of therapeutic alliance present at session two.

Aim 2b) Does the change in therapeutic alliance between session one and session two differ by condition?

Group was added to the model as a predictor of this change in the same mixed model where the main effect of time indexed the difference score which allowed for a direct

examination of group differences in the model. If group was a significant predictor, then there was a difference in the rate of change between the telehealth and face-to-face condition.

Aim 2c) Does the strength of the alliance at the end of treatment predict outcome?

To answer this question, treatment alliance score was added as a predictor of the piecewise model intercept, treatment slope, and follow-up slope. If alliance significantly impacted the intercept, this meant that the alliance score influenced the mean difference present between baseline and the first follow-up time point. If alliance has a significant influence on the treatment slope, this would indicate that alliance score affects the rate of change in alcohol outcome from baseline to one month post treatment. Similarly, an effect on the follow-up slope would determine that the alliance score impacted the rate of change from one to three months post treatment in alcohol outcome.

Aim 2d) Does the predictive power of therapeutic alliance differ by condition?

An interaction between group and therapeutic alliance was calculated for use to answer this question. The interaction term was utilized as a predictor of the intercept, treatment slope, and follow-up slope. Similar to the above, a significant effect on the intercept would be indicative of mean differences based on the interaction, while significant effects on the treatment or follow up slope would convey an effect of the rate of change. If an effect was found, estimate statements were then utilized to obtain predicted outcomes and simple effects for specific individuals, such as those who are in the face-to-face group with high levels of therapeutic alliance, those in the face-to-face group with low levels of therapeutic alliance, those in the telehealth group with high levels of therapeutic alliance, and those in the telehealth group with low levels of therapeutic alliance. Additionally,

differences would be presented in graphical form utilizing excel to facilitate ease of explanation.

Aim 3a) Does condition impact the participant's satisfaction ratings?

The Client Satisfaction Questionnaire (CSQ-8) was utilized as an indicator of treatment satisfaction. Adding group as a predictor of client satisfaction assessed this question. If it was significant, then there would be group differences in satisfaction and estimate statements and a graph would be utilized to clarify the relationship between group and satisfaction.

Aim 3b) Does satisfaction rating predict treatment outcome?

Satisfaction rating was added to the model as a predictor of the intercept, treatment slope, and follow-up slope for the alcohol outcomes. If satisfaction significantly impacted the intercept, this means that the satisfaction score influenced the mean difference present between baseline and the first follow-up time point. If satisfaction had a significant influence on the treatment slope, this would indicate that satisfaction score affected the rate of change in alcohol outcome from baseline to one month post treatment. Similarly, an effect on the follow-up slope would determine that the satisfaction score impacted the rate of change from one to three months post treatment in alcohol outcome.

Aim 4a): How do the participants in the telehealth condition rate their experience in comparison to a face-to-face interaction?

The Telepresence in Videoconferencing Scale (TVS) was examined as a measure of comparison to face-to-face interaction, giving a measure of presence. To answer this question, the overall score as well as the subscales were analyzed to determine whether the participants report a high level of each of these factors.

Aim 4b): Does telepresence impact treatment outcome?

To test this hypothesis, telepresence score was added as a predictor of the piecewise model intercept, treatment slope, and follow-up slope. This was a nested effect for the telehealth group only, as those not in the telehealth condition did not complete this measure. If presence significantly impacted the intercept, this meant that the presence score influences the mean difference present between baseline and the first follow-up time point. If presence had a significant influence on the treatment slope, this would indicate that presence score affects the rate of change in alcohol outcome from baseline to one month post treatment. Similarly, an effect on the follow-up slope would determine that the presence score impacted the rate of change from one to three months post treatment in alcohol outcome.

Chapter 3: Results

Treatment Fidelity

The fidelity of the brief motivational intervention was assessed by utilizing the Motivational Interviewing Treatment Integrity Code (MITI) 3.1.1 and the recommended fidelity rating procedures in prior studies (Barnett, Murphy, Colby, & Monti, 2007; Carey, Henson, Carey, & Maisto, 2009). Specifically, two independent coders reviewed twenty percent of each therapist's sessions from each condition and session number combination (e.g., Telehealth, Session 1, for Therapist 1). The sessions to be reviewed were randomly selected by utilizing a random number generator. Sessions were rated across five global ratings that are indicators of MI competence: evocation, collaboration, autonomy/support, direction, and empathy. Additionally, behavior counts of questions, reflections, and MI adherent as well as non-adherent behaviors were recorded. Several meetings were held to

identify and discuss discrepancies on ratings between coders. For the vast majority of sessions, coders were within the acceptable 1-point reliability range on the global rating scales (Range = 0 to 5). Consistent with MITI recommendations and procedures used in similar studies (e.g., Carey, Scott-Sheldon, Carey, & DeMartini, 2007), when raters differed by two or more points, coders discussed the rationale for their ratings until coder ratings were within the acceptable 1-point range. Inter-rater reliability was calculated using Two-Way Mixed Intraclass Coefficients and ICC's ranged from (r = .548 to .683) for each rating of MI competency. This is within the range identified in a meta-analysis of similar interventions (Carey, Scott-Sheldon, Carey, & DeMartini, 2007).

The MITI 3.1.1 authors indicate that an average global rating of 3.5 is beginning proficiency, with 4.0 as a marker for full competency in the MI technique. Across all therapists, conditions, and sessions, the mean global rating was 3.9385, and the Median was 4.0000. To determine whether therapists varied significantly on the mean global rating score, a 3 way between group Analysis of Variance (ANOVA) and post hoc test was conducted. There were significant mean differences in the mean global rating scales across therapists, $F(2,49) = 10.740$, Mse = .239, $p < .001$. Pairwise comparisons utilizing LSD revealed that therapist 0 (M = 4.133, Std = .463) and therapist 1 (M = 4.075, Std = .443) had significantly higher mean global rating scores than therapist 2 (M = 3.367, Std .590), with no significant differences between the mean global rating scores of therapist 0 and 1. Significant differences were also present in the amount of reflections utilized across therapists, $F(2,49) = 37.405$, Mse = 37.124, $p < .001$. Pairwise comparisons utilizing LSD revealed that therapist 0 (M = 23.958, Std = 1.244) had a significantly higher amount of reflections on average than therapist 1 (M = 17.313, Std = 1.523) or therapist 2 (M = 5.333, Std = 1.759), with therapist 1

also having a significantly higher number of reflections than therapist 2. No differences were identified in the ratio between MI adherent and non-adherent behaviors, as only one instance of non-adherence was identified across all recorded sessions. Due to the presence of significant differences in MI competency, therapist (0 = Full Competency, 1 = Beginning Competency) was added as a control variable to the models.

Randomization and Preliminary Analyses

Experimental variables and key demographic variables were assessed for significant differences at baseline utilizing between groups ANOVAs as seen in Table 3.1. Mean differences were examined between the face-to-face and telehealth groups in regards to age, year in school, Greek status, self-identified race, presence of a mental health diagnosis, gender, and initial AUDIT and RAPI score to determine whether or not the matching and randomization process was successful. Participants in both conditions reported mean pre-intervention levels of drinking in the problematic range (AUDIT > 6). No significant differences in problematic drinking at baseline (as measured by AUDIT and RAPI) were found between treatment groups (p > .05). Groups were also equivalent in relation to gender, Greek status, year in college, and history of mental health diagnosis. No respondents indicated that they had previously completed the ASTP or BASICS program, thus all participant data was utilized in the final analyses. All but one respondent indicated that they use the internet on a daily basis and the average amount of time spent on the internet per day was 3-5 hours (53.6%). The majority of participants reported minimal experience with video chatting, with only 7.1% of participants (*n* = 4) reporting that they used video chat "very

frequently." Given the high amount of familiarity with the internet in general, comfort with

the internet was not utilized as a control variable in the models.

Table 3.1

Descriptive Statistics across Treatment Condition

Variable	Face-to-Face (n = 24)	Telehealth (n = 27)	ANOVA Statistics
Gender	58.3 % Female	63.0% Female	F = .110, df = 1,49
			Mse = .248, p = .742
Age	19.54 (Std = 1.35)	19.48 (Std = 1.48)	F = .023, df = 1,49
			Mse = 2.014, p = .880
Year in college	Freshmen 50%	Freshmen 63%	F = .096, df = 1,49
	Sophomore 25%	Sophomore 11.1%	
	Junior 12.5%	Junior 11.1%	Mse = 1.251, p = .758
	Senior+ 12.5%	Senior+ 14.8%	
Greek	45.8% Greek	25.9% Greek	F = 2.214, df = 1,49
			Mse = .227, p = .143
Race	91.7% White	92.6% White	F = .015, df = 1,49
			Mse = 3.075, p = .903
Mental Health Dx	20.8% Yes	22.2% Yes	F = .014, df = 1,49
			Mse = .176, p = .907
AUDIT Baseline	10.08 (Std = 3.80)	9.26 (Std = 4.16)	F = .540, df = 1,49
			Mse = 15.980, p = .466
RAPI Baseline	8.17 (Std = 5.71)	8.18 (Std = 7.97)	F = .000, df = 1,49
			Mse = 49.008, p = .993

Descriptive statistics for the outcome variables were calculated at baseline, session

one, session two, and at the three post-intervention follow-up time points to determine

attrition across the study. Additionally, the pattern of the means for both AUDIT and RAPI

were identified in order to estimate which model type may result in the best fitting model.

See Figure 3.1 for a summary of attrition and means across time.

Figure 3.1

Attrition and Pattern of Means across Time by Group
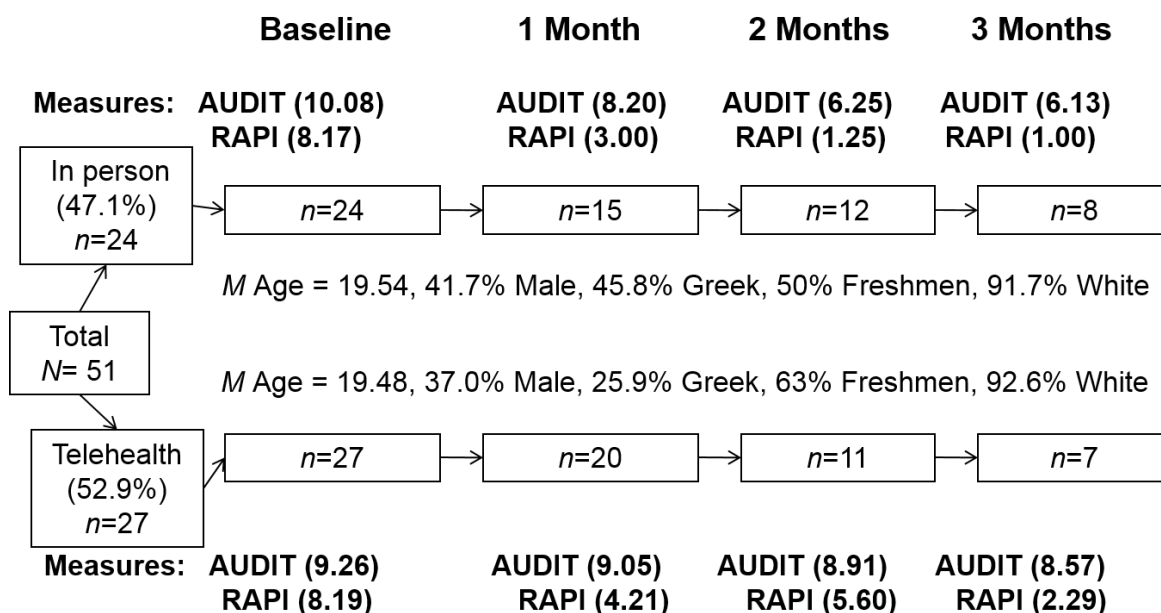
Aim 1: Is the teleconferencing intervention equivalent in effectiveness to the face-to-face intervention?

Unconditional Growth Models – AUDIT Outcome

A Saturated Means, Unstructured Variances Model, was examined for both AUDIT and RAPI to provide a basis for comparison and allow for an examination of the pattern of variances and covariances across occasions as well as the pattern of the means. The fit of the model for AUDIT was −2LL(15) = 644.7, AIC = 664.7, BIC = 684.0. The variances for AUDIT at each time point increased slightly from baseline (15.83) to 1 month (18.99) and were similar for months 2 (24.78) and 3 (24.26). The covariances along the first diagonal

steadily increased from baseline to one month (13.65), one to two months (16.04), and two to three months (18.55). Along the second diagonal, the covariance between baseline and 2 months (13.28) is greater than that between month 1 and 3 (9.59), with the last diagonal having the least covariance (baseline to 3 months, 9.03). Thus, variance increases across time, and covariance tends to be greater among adjacent time points, with covariance higher across the later time points. In regards to the pattern of means over time, they decrease steadily from 0 to 3 months. Given that this was a treatment study, the greatest rate of change was expected to occur immediately after treatment. While the data did not match these specifications exactly, a piecewise model with a treatment slope from baseline to 1 month, and a follow up slope from 1 month to three months post treatment, was utilized for theoretical reasons.   See Figure 3.1 for a graphical representation of the observed and predicted pattern of means across time.

Unconditional models were examined to describe the overall pattern of and individual differences in change in a problematic alcohol use outcome measured over four occasions including baseline (pre-treatment), one month, two month, and three months post treatment. The time observations were balanced across persons and time was centered such that the intercept indicated the effects at 1 month, the first occasion post-treatment. The significance of the added effects was examined utilizing Wald test p-values for fixed effects and $-2\Delta LL$ for random effects. The 95% confidence interval (CI) for the random variation around each fixed effect was calculated as +/- 1.96 standard deviations of its accompanying random variance term.

Piecewise models of change were examined due to theoretical reasons (i.e., treatment study) as well as being a good match for the overall pattern of the means. Two separate

linear slopes (0-1, 1-3) illustrated change before and after 1-month follow-up. The fit of a two fixed slope piecewise model was -2LL(5) = 658.2, AIC = 662.3, BIC = 666.0. The addition of a random slope variance for baseline to month 1 did not significantly improve model fit, $-2\Delta LL(\sim 2) = 2.4$, p = .3012 (with a smaller AIC and larger BIC), -2LL(7) = 655.8, AIC = 661.8, BIC = 667.6. However, a fixed first and addition of a random second slope did significantly improve model fit, $-2\Delta LL(\sim 2) = 6.2$, p = .0450 (with a smaller AIC and similar but slightly larger BIC), -2LL(7) = 652.0, AIC = 660.0, BIC = 667.7. The addition of a random slope variance for month 0 to month 1 along with the random second slope did not significantly improve fit, $-2\Delta LL(\sim 3) = 1.6$, p = .6594 (with a smaller AIC and larger BIC), -2LL(10) = 650.4, AIC = 664.4, BIC = 67.9. As such, the best-fitting piecewise model included a fixed treatment slope and a random follow-up slope. See Table 3.2 for the unconditional effects from the final AUDIT model.

The first slope, slope 0-1 was significant (p = .05), such that between baseline (month 0) and month 1, the AUDIT score decreased by 0.9129 points. The second slope, slope 1-3 was also significant, in that the AUDIT score decreased on average 1.1596 points per month from month 1 to month 3. Additionally, an ESTIMATE statement was utilized to determine whether or not the slopes were significantly different. The ESTIMATE statement indicated that the follow-up slope was non-significantly more negative by 0.2467 (p > .05). See Figure 3.2 for a graphical representation of the observed versus predicted means by the best-fitting piecewise model with a fixed treatment slope and a random follow-up slope.

Table 3.2

Unconditional Effects from Two Piecewise Model for AUDIT Outcome

Parameter	Estimate	Standard Error	p Value
Fixed Effects			
Intercept	8.7342	0.6316	< .0001
Month 0-1 Slope	-0.9129	0.4632	0.0547
Month 1-3 Slope	-1.1596	0.5216	0.0382
Slope Difference 0-1 and 1-3	-0.2467	0.8020	0.7593
Variance Model			
Random Intercept Variance (1,1)	13.4957	3.2284	< .0001
Random Linear Month 1-3 Variance (2,2)	3.4756	2.1977	0.0569
Random Intercept-Linear Month 1-3 Covariance (2,1)	-.5627	2.2344	0.8012

Figure 3.2

Observed vs Predicted Means from AUDIT Model
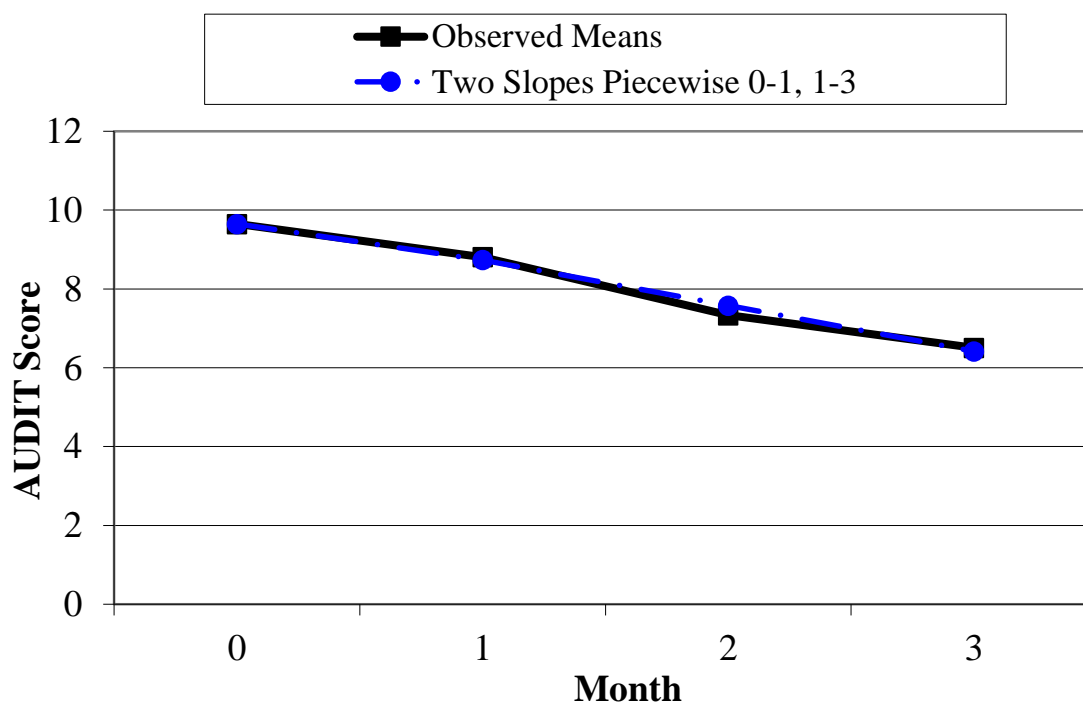
Conditional Model (Predictors Added) for AUDIT

Next, predictors and control variables were added to the best fitting unconditional model for AUDIT (Fixed Slope 1, Random Slope 2). All predictors were time invariant. These included condition (face-to-face vs online), gender, therapist, working alliance (following session two), client satisfaction (following session two), and whether or not the participant had a diagnosed mental health disorder (dichotomized into yes no inclusive of anxiety, depression, bipolar, posttraumatic stress disorder, or schizophrenia). These effects were applied to the intercept and both of the slopes. Additionally, interactions between group and CSQ as well as group and WAI were added to be able to address most hypotheses from the one model. The addition of these predictors resulted in a final model fit of -2LL(34) = 472.7, AIC = 480.7, BIC = 487.2. The predictive power of telepresence on the outcome trajectory was examined by utilizing a nested effect only for those in the telehealth condition.

The intercept indicated an AUDIT score of 9.6879 at 1-month post treatment for those at the mean of the analyzed variables. No differences on the intercept (score at 1 month) were found between gender, condition, therapist, mental health diagnosis, level of working alliance, client satisfaction, or telepresence. This means that all levels of each of these predictors had a statistically equivalent AUDIT score at 1-month post treatment. There was no significant effect of the treatment or follow up slope, meaning that the AUDIT score (from baseline to 1 month) decreased non-significantly by 1.0138 and the AUDIT score decreased non-significantly by 2.2607 each month from months 1 to 3. This resulted in a final AUDIT score of 5.1665, which is indicative of non-problematic drinking.

Additionally, there was no effect of gender, group, therapist, client satisfaction, or telepresence on the treatment or follow-up slope, meaning that the rate of change was the

same regardless of these variables.   The only predictor with a significant effect was WAI,

which is discussed with hypothesis 2c. See Table 3.3 for a summary of these fixed effects.

Table 3.3

Summary of Effects for the AUDIT Outcome Model

Parameter	Estimate	Standard Error	p Value
Fixed Effects			
Intercept	9.6879	1.5780	<.0001
Slope Baseline to 1 Month (0-1)	-1.0138	1.3415	0.4554
Slope 1 to 3 months (1-3)	-2.2607	1.6345	0.1832
Gender (0 = Male) on Intercept	-0.3375	1.6507	0.8389
Condition (0 = Face to Face) on Intercept	1.1611	1.5351	0.4535
Therapist on Intercept	-4.5241	2.4602	0.0715
Mean of Working Alliance on Intercept	-0.5027	0.1950	0.0128
Mean of Client Satisfaction on Intercept	0.8333	0.4734	0.0843
Mental Health Diagnosis (0 = No) on Intercept	2.8212	2.4298	0.2511
Nested Effect of Telepresence on Intercept	0.09712	0.05910	0.1064
Gender on Slope 0-1	0.8412	1.3864	0.5485
Condition on Slope 0-1	0.8423	1.2642	0.5104
Therapist on Slope 0-1	-2.7467	2.1500	0.2105
Mean of Working Alliance on Slope 0-1	-0.2430	0.1680	0.1579
Mean of Client Satisfaction on Slope 0-1	0.1522	0.4073	0.7111
Mental Health Diagnosis on Slope 0-1	-0.09296	2.0739	0.9645
Nested Effect of Telepresence on Slope 0-1	0.01589	0.05108	0.7578
Gender on Slope 1-3	-0.2919	1.7489	0.8694

Condition on Slope 1-3	1.8227	1.5843	0.2655
Therapist on Slope 1-3	2.0715	2.7413	0.4635
Mean of Working Alliance on Slope 1-3	0.1515	0.1792	0.4101
Mean of Client Satisfaction on Slope 1-3	-0.6032	0.4037	0.1559
Mental Health Diagnosis on Slope 1-3	-0.3396	2.2215	0.8809
Nested Effect of Telepresence on Slope 1-3	0.06042	0.08613	0.4980
Condition x Mean of Working Alliance on Intercept	0.02376	0.3583	0.9474
Condition x Client Satisfaction on Intercept	0.2708	0.8016	0.7371
Condition x Mean of Working Alliance on Slope 0-1	0.1251	0.2925	0.6719
Condition x Client Satisfaction on Slope 0-1	0.3114	0.6666	0.6437
Condition x Mean of Working Alliance on Slope 1-3	-0.1218	0.4164	0.7747
Condition x Client Satisfaction on Slope 1-3	0.07631	0.9704	0.9388
Variance Model			
Random Intercept Variance (1,1)	11.5919	4.0519	0.0021
Random Linear Month 1-3 Variance (2,2)	5.6973	4.4551	0.1005
Random Intercept-Linear Month 1-3 Covariance (2,1)	-2.6867	3.5247	0.4459

Unconditional Growth Models – RAPI Outcome

A Saturated Means, Unstructured Variances Model, was also examined for RAPI to provide a basis for comparison and allow for an examination of the pattern of variances and covariances across occasions as well as the pattern of the means. The fit of the model for RAPI was $-2LL(15) = 681.8$, AIC = 701.8, BIC = 721.1. The variances decreased from baseline (48.0282) to 1 month (25.3345), decreased at 2 months (13.4055) and again at 3 months (10.4403). The covariances along the first diagonal decreased from 16.9586 from baseline to one month to 12.4982 for one to two months, and again decreased for two to three

months (10.6390). Along the second diagonal, the covariance between baseline and 2

months (11.8187) is similar to that between month 1 and 3 (12.0483), with the last diagonal

having similar covariance (baseline to 3 months, 11.0614). Thus, RAPI variance decreased

across time. Additionally, covariance tended to be greater among adjacent time points, with

covariance higher for baseline to 1 month, and for 2 to 3 months. In regards to the pattern of

means over time, they decrease steadily from 0 to 3 months. Given that this was a treatment

study, the greatest rate of change was expected to occur immediately after treatment. The

RAPI outcome matched this expected pattern, thus a piecewise model with a treatment slope

from baseline to 1 month, and a follow up slope from 1 month to three months post

treatment, was utilized for both data and theoretical reasons.

Unconditional models were examined to describe the overall pattern of and individual

differences in change in RAPI measured over four occasions including baseline (pre-

treatment), one month, two month, and three months post treatment. The time observations

were balanced across persons and time was centered such that the intercept indicated the

effects at 1 month, the first occasion post-treatment. The significance of the added effects

was examined utilizing Wald test p-values for fixed effects and $-2\Delta LL$ for random effects.

The 95% confidence interval (CI) for the random variation around each fixed effect was

calculated as +/- 1.96 standard deviations of its accompanying random variance term.

Piecewise models of change were examined due to theoretical reasons (i.e., treatment

study) as well as being a good match for the overall pattern of the means. Two separate

linear slopes (0-1, 1-3) illustrated change before and after month 1. The fit of a two fixed

slope piecewise model for RAPI was $-2LL(5) = 728.7$, AIC = 732.7, BIC = 736.6. The

addition of a random first slope variance with a fixed second slope variance did significantly

improve model fit, $-2\Delta LL(\sim 2) = 31.3$, $p < .001$ (with a smaller AIC and BIC), $-2LL(7) =$ 697.4, AIC = 705.4, BIC = 713.1. The addition of a random slope variance for the second slope (1 to 3 months) but a fixed slope variance for the first also significantly improved model fit when compared to the two fixed slopes model, $-2\Delta LL(\sim 2) = 9.3$, $p = .009$ (with a smaller AIC and BIC), $-2LL(7) = 719.4$, AIC = 725.4, BIC = 731.1. However, this model improved fit less than the random first slope fixed second slope model. Moreover, the addition of a random slope variance for both slopes did not significantly improve fit over the random first slope, fixed second slope model, $-2\Delta LL(\sim 3) = 4.3$, $p = .2308$ (with a smaller AIC and larger BIC), $-2LL(10) = 693.1$, AIC = 705.1, BIC = 716.7. As such, the best-fitting piecewise model included a random treatment slope and a fixed follow-up slope. Refer to Table 3.4 for a summary of model effects.

The intercept indicated that the RAPI score at 1 month post-intervention was 3.6878. The first slope, slope 0-1 was significant ($p < .0001$), such that between baseline (month 0) and month 1, the RAPI score decreased by 4.4886 points. The second slope, slope 1-3 was also significant ($p = .0178$), in that the RAPI score decreased on average 0.8015 points per month from month 1 to month 3. Additionally, an ESTIMATE statement was utilized to determine whether or not the slopes were significantly different. The ESTIMATE statement indicated that the treatment slope was significantly more negative by 3.6872 ($p = .0013$). See Figure 3.3 for a graphical representation of the observed and predicted pattern of means across time.

Table 3.4

Unconditional Effects from Two Piecewise Model for RAPI Outcome

Parameter	Estimate	Standard Error	p Value
Fixed Effects			
Intercept	3.6878	0.7614	< .0001
Month 0-1 Slope	-4.4886	0.9880	< .0001
Month 1-3 Slope	-0.8015	0.3217	0.0178
Slope Difference 0-1 and 1-3	3.6872	1.0982	0.0013
Variance Model			
Random Intercept Variance (1,1)	17.9873	4.9487	< .0001
Random Linear Month 0-1 Variance (2,2)	34.6391	9.0134	< .0001
Random Intercept-Linear Month 0-1 Covariance (2,1)	4.0828	5.0658	0.4203

Figure 3.3

Observed vs Predicted Means from Unstructured and Piecewise RAPI Models
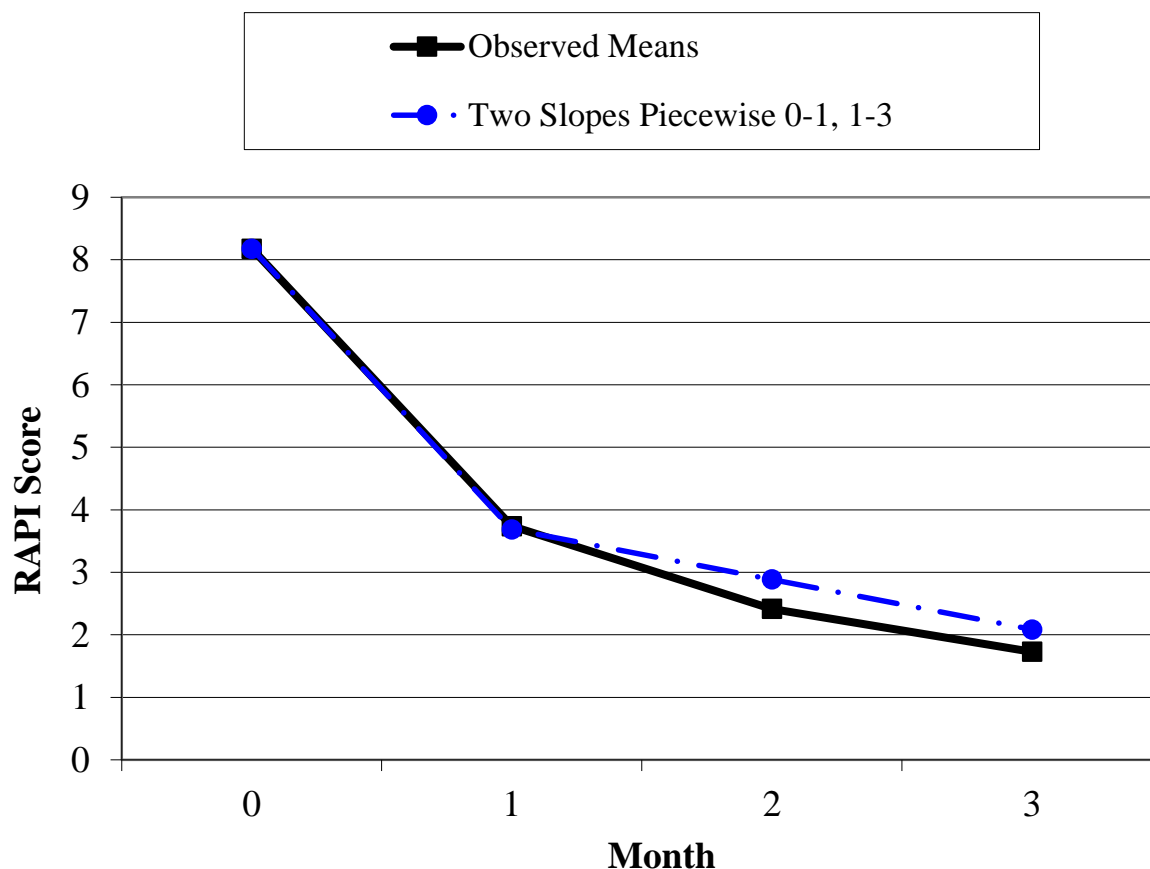
Conditional Model (Predictors Added) for RAPI

Next, predictors and control variables were added to the best fitting unconditional

model. All predictors were time invariant. These included condition (face-to-face vs online),

gender, therapist, working alliance (following session two), client satisfaction (following

session two), telepresence, and whether or not (dichotomized into yes or no) the participant

had a diagnosed mental health disorder, which included anxiety, depression, bipolar,

posttraumatic stress disorder, or schizophrenia. These effects were applied to the intercept

and both of the slopes. Additionally, interactions between group and CSQ as well as group

and WAI were added to be able to address most hypotheses from the one model. However,

the addition of both CSQ and WAI to the same model as well as telepresence and WAI

resulted in nonsensical patterns, likely due to the small sample size and no individuals in the

model meeting the combination of conditions predicted. As such, a separate model was

utilized to test the effects of both WAI and CSQ with the same predictors and interactions

included in both models, and the effect of telepresence was tested in the CSQ model. The

model fit for the conditional model with WAI was -2LL(25) = 585.2, AIC = 593.2, BIC =

600.3 and the fit for the model with CSQ was -2LL(28) = 509.7, AIC = 517.7, BIC = 524.2.

See Tables 3.5 and 3.6 for a list of the fixed effects from each model.

Table 3.5

RAPI Conditional Model with WAI

Parameter	Estimate	Standard Error	p Value
Fixed Effects			
Intercept	4.9467	1.8983	0.0141
Slope Baseline to 1 Month (0-1)	-2.6745	2.3230	0.2570
Slope 1 to 3 months (1-3)	0.2279	0.7551	0.7652
Gender (0 = Male) on Intercept	-1.4308	2.1161	0.5044
Condition (0 = Face to Face) on Intercept	0.7016	1.8720	0.7107
Therapist on Intercept	-0.3179	2.5504	0.9017
Mean of Working Alliance on Intercept	-0.3053	0.1789	0.0990
Mental Health Diagnosis (0 = No) on Intercept	-1.2974	2.5194	0.6108
Gender on Slope 0-1	-2.0562	2.5742	0.4296
Condition on Slope 0-1	0.5728	2.3060	0.8053
Therapist on Slope 0-1	2.1051	3.0861	0.4996
Mean of Working Alliance on Slope 0-1	-0.2260	0.2186	0.3081
Mental Health Diagnosis on Slope 0-1	-6.8352	3.0551	0.0318

Gender on Slope 1-3	-1.3754	0.8870	0.1331
Condition on Slope 1-3	-0.8537	0.7046	0.2363
Therapist on Slope 1-3	1.0161	1.2195	0.4123
Mean of Working Alliance on Slope 1-3	0.04951	0.08378	0.5593
Mental Health Diagnosis on Slope 1-3	0.1258	0.8833	0.8879
Condition x Mean of Working Alliance on Intercept	0.2649	0.2311	0.2616
Condition x Mean of Working Alliance on Slope 0-1	0.1064	0.2854	0.7115
Condition x Mean of Working Alliance on Slope 1-3	0.05644	0.1070	0.6022
Variance Model			
Random Intercept Variance (1,1)	23.2637	7.4120	0.0008
Random Linear Month 1-3 Variance (2,2)	39.0916	11.8434	0.0005
Random Intercept-Linear Month 1-3 Covariance (2,1)	5.9866	7.1708	0.4038

Table 3.6

RAPI Conditional Model with CSQ

Parameter	Estimate	Standard Error	p Value
Fixed Effects			
Intercept	4.2031	2.2337	0.0709
Slope Baseline to 1 Month (0-1)	-2.2364	2.5594	0.3890
Slope 1 to 3 months (1-3)	0.4405	1.1193	0.6974
Gender (0 = Male) on Intercept	-1.3530	2.4225	0.5817
Condition (0 = Face to Face) on Intercept	0.8813	2.3094	0.7063
Therapist on Intercept	1.1496	3.3589	0.7354
Mean of Client Satisfaction on Intercept	-0.2232	0.4711	0.6401
Mental Health Diagnosis (0 = No) on Intercept	-0.4886	3.6678	0.8952

Nested Effect of Telepresence on Intercept	-0.07646	0.08462	0.3761
Gender on Slope 0-1	-2.2916	2.7721	0.4153
Condition on Slope 0-1	-1.2140	2.6608	0.6518
Therapist on Slope 0-1	2.7111	3.7814	0.4795
Mean of Client Satisfaction on Slope 0-1	-0.3432	0.5436	0.5330
Mental Health Diagnosis on Slope 0-1	-9.2819	4.1391	0.0331
Nested Effect of Telepresence on Slope 0-1	-0.1297	0.09249	0.1723
Gender on Slope 1-3	-1.4350	1.0415	0.1815
Condition on Slope 1-3	-1.7752	1.3832	0.2126
Therapist on Slope 1-3	0.2262	1.8123	0.9018
Mean of Client Satisfaction on Slope 1-3	0.1255	0.1974	0.5318
Mental Health Diagnosis on Slope 1-3	0.2339	1.3633	0.8653
Nested Effect of Telepresence on Slope 1-3	-0.09523	0.1094	0.3930
Condition x Mean of Client Satisfaction on Intercept	0.7871	0.8037	0.3379
Condition x Mean of Client Satisfaction on Slope 0-1	1.1363	0.9042	0.2194
Condition x Mean of Client Satisfaction on Slope 1-3	0.2963	0.4583	0.5247
Variance Model			
Random Intercept Variance (1,1)	29.2001	10.3028	0.0023
Random Linear Month 1-3 Variance (2,2)	40.2476	14.1312	0.0022
Random Intercept-Linear Month 1-3 Covariance (2,1)	7.9695	9.3529	0.3942

It is important to note that the inclusion of all predictors and interaction terms simultaneously result in model interpretation specific to individuals who have the average or zero score of each predictor. As both models had the same significant effects, for the purposes of interpretation for the RAPI outcome, the WAI model was used. The intercept

indicated a RAPI score of 4.9467 (for WAI model) at 1 month post treatment for those at the mean of the analyzed variables. No differences on the intercept (score at 1 month) were found between gender, condition, therapist, mental health diagnosis, level of working alliance, client satisfaction, or telepresence. This means that all levels of each of these predictors had a statistically equivalent RAPI score at 1-month post treatment.   There was no significant effect of the treatment or follow up slope, meaning that the RAPI score (from baseline to 1 month) decreased non-significantly by 2.6745 and the RAPI score increased non-significantly by .2279 each month from months 1 to 3. Additionally, there was no effect of gender, group, therapist, working alliance, client satisfaction, or telepresence on the treatment slope, meaning that the rate of change was the same regardless of these variables. However, the presence of a mental health diagnosis (coded 0 = No, 1 = Yes) did have a significant effect, in that those with a mental health diagnosis experienced a significantly greater rate of change by 6.8352 between baseline and 1-month post treatment. Please see Figure 3.4 for a graphical representation of the effect of mental health diagnosis.

In relation to the follow-up slope, there was no effect of group, gender, therapist, working alliance, mental health diagnosis, client satisfaction, or telepresence. In regards to the interaction terms, there was no interaction between group and working alliance or group and client satisfaction on the intercept (RAPI score at 1 month post-treatment) or on either slope.

Figure 3.4

Effect of Mental Health Diagnosis on RAPI Outcome
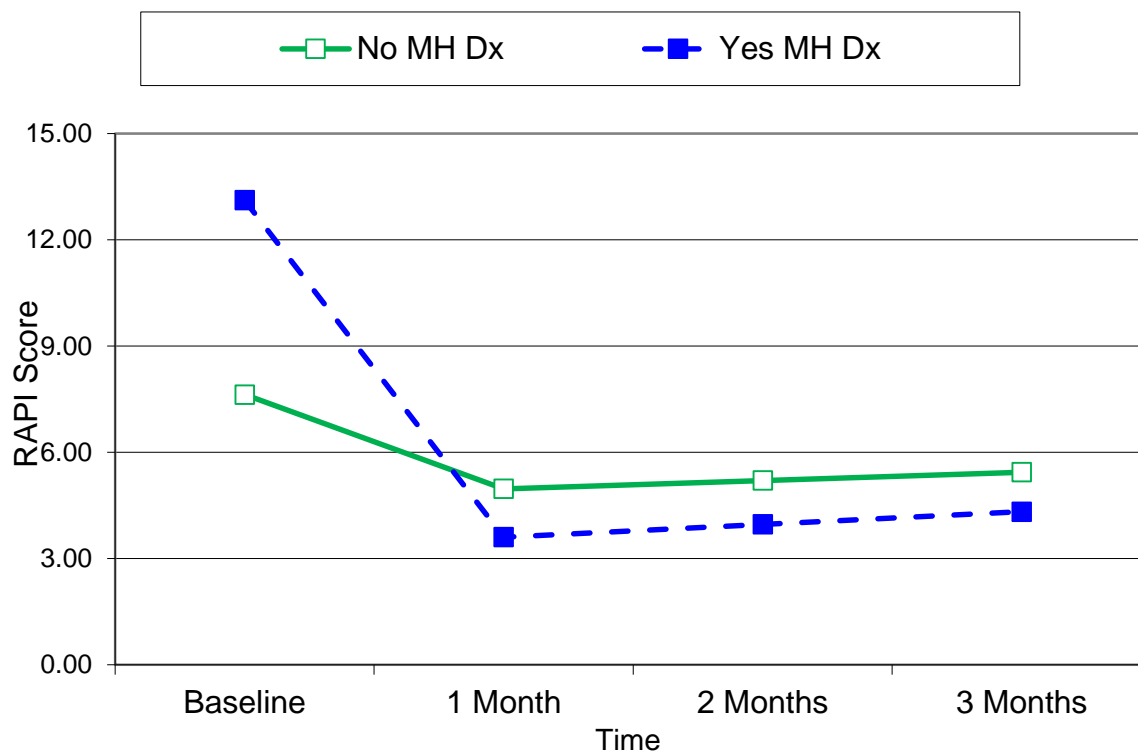
Aim 2a) Does the therapeutic alliance change significantly between session one and session two?

A 2x2 mixed ANOVA was utilized to determine whether there was a significant change in therapeutic alliance from session 1 to session 2 and if the condition had an effect on this change or the means at each occasion. Averaged across conditions, results indicated that the WAI increased significantly between session 1 (M = 44.479, SE = 1.366) and session 2 (49.744, SE = 1.337), F(1,38) = 30.517, Mse = 18.126, p < .001.

Aim 2b) Does the change in therapeutic alliance between session one and session two differ by condition?

Utilizing the same 2x2 mixed ANOVA mentioned for hypothesis 2a, no significant difference was found between groups for the WAI score at session 1 $F(1,42) = .044$, Mse = 3.287, $p = .836$, or session 2 $F(1,43) = 1.221$, Mse = 87.364, $p = .275$. Additionally, the rate of change was the same for both conditions $F(1,38) = .334$, Mse = 63.828, $p = .567$.

Aim 2c) Does the strength of the alliance at the end of treatment predict outcome?

The strength of the therapeutic alliance following session 2 was added as a predictor of the piecewise model intercept, treatment slope, and follow-up slope for both outcome variables. There was no significant difference on any of these pieces for RAPI (See Tables 3.5 and 3.6), but there was an effect on the AUDIT score. Specifically, when at the mean or zero condition of the other predictors, each additional point of WAI above the mean lowered the AUDIT score by .5027 at the first follow up time point (see Figure 3.5). As such, the strength of the therapeutic alliance was predictive for outcome as measured by AUDIT but not by RAPI.

Figure 3.5

The Effect of High versus Low Therapeutic Alliance (WAI) on AUDIT Score
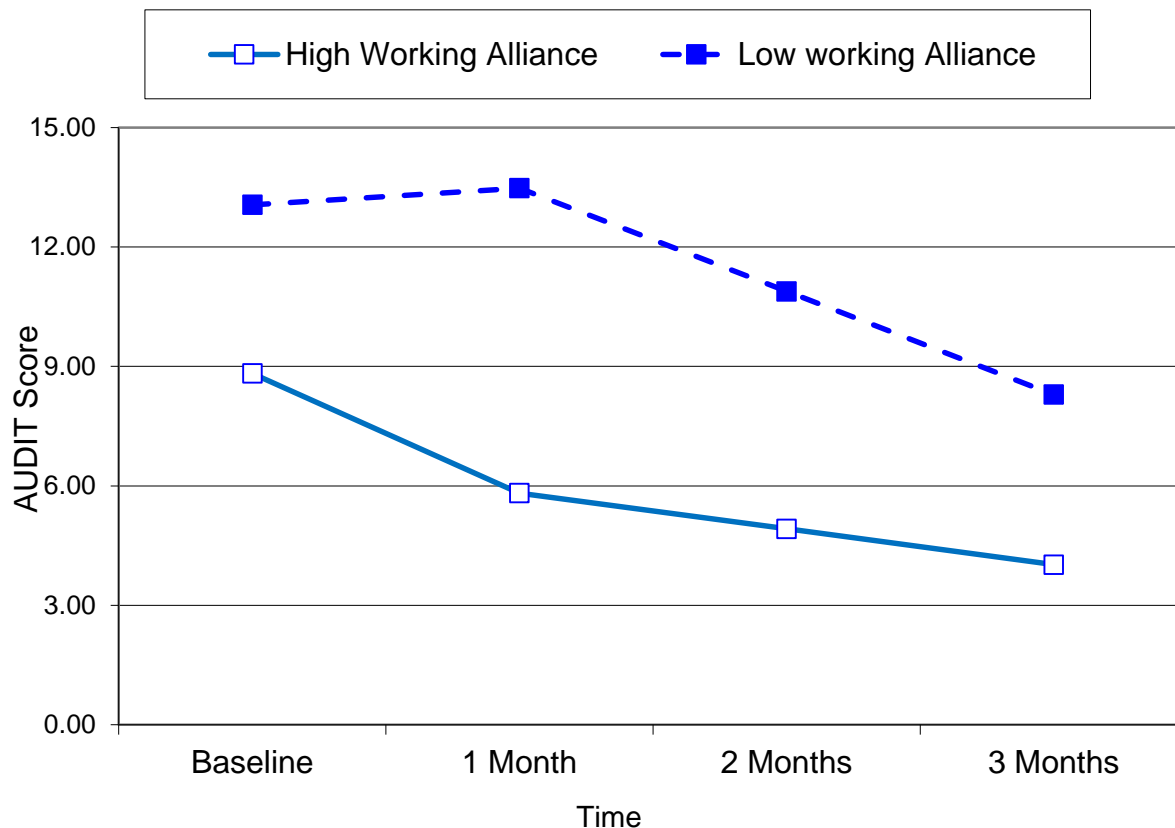
Aim 2d) Does the predictive power of therapeutic alliance differ by condition?

An interaction between group and therapeutic alliance was calculated and utilized as a predictor of the intercept, treatment slope, and follow-up slope for both outcomes. No interaction was found for the AUDIT or RAPI outcome, meaning that there was no significant difference in score at 1-month post treatment for the interaction, and the interaction did not significantly impact either slope.

Aim 3a) Does condition impact the participant's satisfaction ratings?

A 2x2 mixed ANOVA was utilized to determine whether there was a significant change in client satisfaction from session 1 to session 2 and if the condition had an effect on

this change or the means at each occasion. Averaged across conditions, results indicated that the CSQ increased significantly between session 1 (M = 27.408, SE = .531) and session 2 (28.220, SE = .556), F(1,39) = 6.493, Mse = 2.072, p = .015. No significant difference was found between groups for the CSQ score at session 1 F(1,42) = .086, Mse = 11.241, p = .086, or session 2 F(1,45) = 11.989, Mse = 11.989, p = .206. Additionally, the rate of change was the same for both conditions F(1,39) = 2.321, Mse = 22.001, p = .136.

Aim 3b) Does satisfaction rating predict treatment outcome?

Satisfaction rating following session 2 was added to the model as a predictor of the intercept, treatment slope, and follow-up slope for the alcohol outcomes. There was no effect of client satisfaction on the AUDIT or RAPI outcome, meaning that it did not significantly impact change in score from baseline to one month or from one to three months. Additionally, satisfaction rating did not impact the score at 1 month post intervention.

Aim 4a): How do the participants in the telehealth condition rate their experience in comparison to a face-to-face interaction?

The Temple Presence Inventory (TPI) was examined as a measure of comparison to face-to-face interaction, giving a measure of presence. At this time, the TPI is a relatively new instrument and subsequently the researcher was unable to locate cutoff scores indicative of high or low presence. As such, the subscale scores were examined and compared to the scores gathered in the original TPI study for two conditions: a condition expected to be high presence and a condition expected to be low presence. See Table 3.7 to view the comparison of scores in the telehealth condition with the high and low presence condition. It appears for most subscales, those in the telehealth condition rated their experience of presence at or above that of the "high presence" condition in the original study.

Table 3.7

TPI Subscale Scores in the Telehealth Condition Compared to TPI Study

Subscale	Telehealth Condition	Measurement Development Study (Lombard, Ditton, & Weinstein, 2009)	
	Level of Presence	High Presence Condition	Low Presence Condition
Spatial	3.65 (SD 1.39) n=21	5.05	2.12
Social-actor	4.50 (SD 1.20) n=20	3.34	2.00
Passive social	4.72 (SD 1.23) n=22	5.33	5.42
Active social	4.92 (SD 1.18) n=20	3.16	3.46
Engagement	4.64 (SD 1.08) n=19	5.19	3.53
Social richness	4.94 (SD .95) n=20	4.87	3.22
Social realism	4.79 (SD 1.45) n=21	3.41	3.10
Perceptual realism	4.14 (SD 1.23) n=21	3.79	2.41

Aim 4b): Does telepresence impact treatment outcome?

A total of 16 participants responded to all questions on the Temple Presence Inventory, with a Mean score of 192.8125, Minimum 126, and Maximum 254 (Std 31.16). The original study provides no measure of comparison for the overall mean score; as such overall telepresence was utilized as a predictor in that higher scores equal greater telepresence. Telepresence score (centered at the mean) was added as a predictor of the piecewise model intercept, treatment slope, and follow-up slope to both the AUDIT and RAPI model. No effect of TPI was found, thus telepresence did not significantly influence the mean difference at time 1, the rate of change for the treatment slope, or the rate of change for the follow up slope.

Chapter 4: Discussion

The current study examined the effectiveness of and user experience related to a brief telehealth intervention when compared to face-to-face delivery of the same intervention. Specifically, the researcher sought to determine whether the BASICS intervention, which has well-supported effectiveness when delivered face-to-face, was also effective when delivered via telehealth. Several other aims were explored that gathered information about the therapeutic process, how it impacted treatment outcome, and whether it differed between conditions. A measure of telepresence, which assessed how closely the telehealth interaction approximated a face-to-face scenario, was also analyzed. Results were indicative of an effective intervention regardless of the condition. As a whole, therapeutic process variables minimally influenced treatment outcome and did not differ by condition. Additionally, the telepresence measure was indicative of high telepresence, which suggests that those in the telehealth condition perceived the interaction as similar to a face-to-face interaction. The specific results from each aim are discussed below in greater detail.

The results from Aim 1 supported the hypothesis and indicated that the BASICS intervention was effective in reducing problematic alcohol use regardless of treatment modality or outcome. Results determined that the amount of change from pre-session to the 1-month follow up and the rate of change for both the treatment and follow-up slope is statistically equivalent for both modalities. These results are consistent with the findings of most prior studies which have also found telehealth to be equivalently effective to the face-to-face intervention for alcohol and other mental health disorders (Frueh et al., 2007; Gros et al., 2013; King et al., 2009; Himle et al., 2012; Morland et al., 2010; Morland, Pierce, & Wong, 2004). Additionally, these results provide additional information about the specific

pattern of change that occurs after treatment for both modalities as well as treatment outcomes. This suggests that the BASICS intervention not only decreases problematic alcohol use (measured by AUDIT) but that it also reduces the occurrence of problems related to alcohol (measured by RAPI) regardless of modality.

The AUDIT and RAPI outcomes both displayed a similar pattern of change over time. Similarity was expected given the high correlation between alcohol problems and alcohol use (Drummond, 1990) as well as prior research showing significant long-term (24 months) reduction in both AUDIT and RAPI scores following the BASICS intervention (Simao et al., 2008). It is interesting to note that the overall reduction was greater for the RAPI outcome than the AUDIT outcome. This contrast is consistent with prior research which has determined that both alcohol consumption and alcohol dependence are statistically and conceptually different from alcohol problems (Drummond, 1990). This trend is also viewed in the greater population as a whole, given that dependence rates are higher for older adults while alcohol-related problems are most rampant in the early 20s (Cahalan & Cisin, 1977; Makela & Simpura, 1985; Hilton, 1987). This research on differences between these constructs supports the finding that an overall greater reduction was identified for the RAPI outcome than the AUDIT outcome.

This difference may also be due to the intervention reducing the problems related to alcohol more than it reduces alcohol consumption. Prior literature indicates that self-reported measurement of alcohol problems is inherently dependent on the participant's awareness and likelihood of admittance that these problems are related to alcohol use (Drummond, 1990). As discussed previously, part of the BASICS intervention aims to help the participant recognize the positive and negative short and long-term effects of alcohol use. Given this

greater awareness and intensive focus on making changes that will directly impact the amount and severity of alcohol-related problems, more change in the RAPI outcome could be expected.

Many studies examining the effectiveness of an intervention utilize the AUDIT as an identifier of problematic drinking and use RAPI, consumption quantity, or another questionnaire as an outcome measure (e.g., Carey et al., 2007; Samson & Tanner-Smith, 2015; Terlecki, Larimer, & Copeland, 2010; Walters, Vader, & Harris, 2007). Additionally, some researchers examine the measures with a clinical cutoff score (e.g., AUDIT = 8) and dichotomize the outcome to convey clinical significance, with effectiveness for both AUDIT and RAPI outcomes (e.g., Patrick, Evans-Polce, & Maggs, 2014). Given the wide variety of options to measure treatment outcome, little attention has been paid to how the results as measured by these two outcomes might differ when used together in treatment studies.

It is also possible that the difference may be a function of the greater number of items that RAPI has and therefore the potential for greater variability in the outcome. It is recommended that future studies attempt to replicate this effect in a larger population, as it would then be possible to examine potential differences in the AUDIT and RAPI constructs and determine whether there is a true distinction between the reduction of use versus problems or if it is better explained by other factors.

The presence of a mental health diagnosis was also found to have a significant impact on the RAPI outcome. Specifically, those with a mental health diagnosis on average started out with a higher RAPI score at baseline and had a more significant decline in their RAPI score between assessment and 1 month post-intervention than those without a mental health diagnosis. These results are particularly promising given that those with comorbid mental

health disorders are often at a higher risk for alcohol consequences (Ham, Zamboanga, Olthuis, Casner, & Bui, 2010; Norberg, Norton, Olivier, & Zvolensky, 2010; Tran, Haaga, & Chambless, 1997). These findings are consistent with prior research which indicates that a significant decline is observed; however, the treatment gains may not be retained in shorter interventions (Baker, Hiles, Thornton, Hides, & Lubman, 2012). As such, it will be important for future studies to determine whether this effect holds over time.

Aim 2 provided information on the growth of therapeutic alliance, influence on the intervention outcome, and whether or not these differed between modalities. Results supported hypothesis 2a in that it was determined that therapeutic alliance significantly increased between session 1 and session 2. This is consistent with results from a prior study which supported the growth of therapeutic alliance in a brief alcohol intervention with college students (Bolger et al., 2010). This may be explained at least in part by conceptualizing the concept of MI spirit as a type of working alliance (Moyers, Miller, & Hendrickson, 2005) and that high levels of MI spirit may have contributed to the development of this alliance.

In addition, the results of this study confirmed hypothesis 2b and identified that the therapeutic alliance after session 1, after session 2, and the growth of therapeutic alliance did not differ by condition. Aim 2d tested the hypothesis that the predictive power of therapeutic alliance would not differ by condition, and the results supported this hypothesis as there was no interaction between condition and therapeutic alliance. These findings are both supported by prior research (Germain et al., 2010). The results of this study expand this area of literature by confirming that working alliance is not only increased between two sessions in a brief alcohol intervention, but that the growth and outcome prediction is unaffected by

treatment modality. It is important to note that despite the common concern among psychologists that telehealth modalities negatively impact working alliance (Rees & Stone, 2005), these results support prior empirical evidence (Bouchard et al., 2004; Germain, Marchand, Bouchard, Guay, & Drouin, 2010; Ghosh, McLaren, & Watson, 1997; Manchanda & McLaren, 1998) that working alliance is strengthened and maintained within telehealth modalities.

One possible reason for these satisfactory effects found for working alliance is the high degree of telepresence achieved in this intervention which would support minimal negative influence of the telehealth modality on communication, the identified concern presented in prior studies (Fussell & Benimoff, 1995; Gros et al., 2013; Harwood et al., 2011; Manning, Goetz, & Street, 2000). These findings suggest that having a high quality system may mitigate the potential negative influences of telehealth on therapeutic alliance.   Given the poor availability of qualified providers of alcohol interventions in rural areas (American Psychological Association, 2001; Baca et al., 2007) and the importance of telehealth in reaching underserved populations (Backhaus et al., 2012; Campos, 2009; Harwood et al., 2011), it is worth focusing efforts on educating clinicians to help ease these concerns about utilizing telehealth interventions for therapy.

Hypothesis 2c predicted that the strength of the therapeutic alliance would have a small influence on treatment outcome, due to mixed findings in prior research suggesting a small effect (Eyler et al., 2009; Richardson et al., 2012) or no effect (Feldstein & Forcehimes, 2007). Results confirmed this hypothesis to an extent in that findings indicated that therapeutic alliance had no significant impact on RAPI score but that it did have an effect on AUDIT score, in that higher therapeutic alliance was predictive of better outcomes.

As such, this study presented mixed findings related to therapeutic alliance outcome. Prior research has generally indicated that therapeutic alliance positively impacts alcohol treatment outcome (Crits-Christoph et al., 2011; Dundon, Pettinati, & Lynch, 2008; Ilgen, Tiet, Finney, & Moos, 2006), but other variables may have a stronger influence on outcome (Meier, Barrowclough, & Donmall, 2005; Richardson, Adamson, & Deering, 2012). In this study, working alliance was examined as a predictor along with a multitude of other variables. Despite the influence of other variables, therapeutic alliance was still predictive of AUDIT. Given conflicting prior research, the small sample, and short-term outcome, more research should be conducted to determine what effect therapeutic alliance has on the treatment outcome in a brief alcohol intervention.

The third Aim sought to clarify whether or not client satisfaction was impacted by treatment modality as well as whether satisfaction rating was predictive of treatment outcome. Results indicated that satisfaction increased in between sessions, but there was no significant difference in satisfaction at session 1, session 2, or in the rate of change between conditions. Additionally, satisfaction had no effect on treatment outcome. It is noteworthy that the participant's satisfaction rating increased significantly between the two sessions. This may be due to an increased level of satisfaction with change planning than with the initial information gathering and motivation to change session. These findings are consistent with prior research that also did not find a difference in satisfaction level between conditions (Frueh et al., 2005) and in some cases, found greater satisfaction in the telehealth condition (King et al., 2009). Combining the prior research with these findings suggests that participants appear adequately satisfied in the telehealth condition and, indeed, show some

preference to the privacy offered as a result of not physically going to a clinic for substance use treatment.

The final Aim examined a measure of telepresence to determine how those in the telehealth condition rated their experience compared to a face-to-face interaction. Specifically, presence refers to how closely the interaction feels like you are actually sitting in the same room as the other person (DeLucia et al., 2013). Results were consistent with the hypothesis and indicated that participants rated the telehealth experience similar to a face-to-face interaction. This was expected, as prior research voiced concerns about low levels of presence due to difficulty viewing non-verbal communication signals (Fussell & Benimoff, 1995; Gros et al., 2013; Harwood et al., 2011) and the recommendations given about system quality were followed. This finding may be a result of the high quality telehealth system and the consistent speed of the video with minimal delays.

The finding that presence ratings were high in the telehealth condition indicates that effective communication can occur between therapist and client in a verbal and non-verbal manner. This is particularly important in the development of a therapeutic alliance, as a perception of greater distance has been shown to negatively impact this construct (Bradner & Mark, 2002). Additionally, it is imperative that a therapist is able to gather information about a client and his/her symptoms through non-verbal communication due to its role in clinical judgment (Henry, Forman, & Fetters, 2011). When employing telehealth interventions, it may be worthwhile for clinicians to have both the client and themselves complete a measure of presence on a regular basis and take corrective action (e.g., improve equipment, adjust speech pace or volume) when needed.

Additionally, the results showing no effect of telepresence on treatment outcome supported the final hypothesis (4b). This is inconsistent with prior research which demonstrated that higher presence is predictive of better outcomes (Stanney & Cohn, 2006), but this discrepancy may be due to an overall high rating of telepresence for this study, which was expected given the young age of the participants (DeLucia et al., 2013). When considering the generalizability of these results to other therapy populations (e.g., older individuals with substance use disorders), the construct of presence may have more variability. It is also possible that a poorer quality system would have resulted in an impact on treatment outcome. To determine whether this may be the case, it is recommended that future studies vary the quality of the system to identify whether there is a particular threshold at which the interaction becomes less realistic and then determine if this has a negative influence on treatment outcome.

Implications

The results of this study have several important implications for treatment. As noted in the introduction, over half of the counties in the United States lack a mental health professional (American Psychological Association, 2001). The direction of findings as a whole in the mental health field is supportive of the efficacy of telehealth interventions. The results of this study serve to further strengthen the argument that telehealth is an effective way to increase the availability of empirically supported interventions for those with limited access to mental health services. Additionally, telehealth may provide an effective treatment option for those who are uneasy about being seen seeking mental health services. It is concerning that despite a large body of research supporting the effectiveness of telehealth

interventions (including the current study); these services seem to be rare in the community. This may be due to providers' lack of experience with the telehealth technology or misinformation about perceived negative impact on therapeutic alliance and treatment outcome.

Treatments like the BASICS intervention are commonplace at large research universities but are unavailable in rural areas without access to qualified professionals (American Psychological Association, 2001; Baca et al., 2007). In addition, those in rural areas have higher rates of alcohol abuse, are at higher risk for negative alcohol effects (e.g., drunk driving; Substance Abuse and Mental Health Services Administration, 2012; U.S. Census Bureau, 2011) begin drinking at an earlier age (Office of Applied Studies, 2003), and receive more legal charges (Substance Abuse and Mental Health Services Administration, 2012) than their urban counterparts. Given the growing body of literature that is consistent with the current findings, it is recommended that telehealth services be expanded and that treatments such as the BASICS intervention be offered through partnerships to smaller colleges throughout the country. The availability and effectiveness of telehealth provides a method for large research universities with trained professionals to provide therapy services to rural individuals. Specifically, future researchers should aim to partner with a college in a rural area and expand the generalizability of the study by providing the BASICS intervention from one campus to another.

Another important component of this study in the college student alcohol intervention literature was the multilevel modeling technique and the inclusion of both a treatment and a follow-up slope. Only a few studies reviewed in the literature utilized more advanced techniques (e.g., hierarchical linear modeling; Carey, Henson, Carey, & Maisto, 2009;

Logan, Kilmer, King, & Larimer, 2015). The conceptual trajectory of change discussed in this study most closely approximates that which is expected when providing a clinical intervention. Additionally, multilevel modeling allows for the utilization of all data points and provides a more sophisticated picture of the change process. Moreover, by examining most variables of interest in one model, the researcher was better able to approximate the strength of effects in the "real world" where a variety of factors interact. This knowledge may help to improve treatment for specific populations as well as inform future treatment modifications to promote better outcomes.

Study Limitations and Future Directions

While this research provided valuable insight into the effectiveness of the telehealth modality, several important limitations need to be considered. First, the use of telehealth in this study was aimed at testing the efficacy rather than the overall logistics of long distance therapy, as the therapist and participant were in different rooms of the same building. Although this set-up provides important information about the overall effectiveness of this modality, it will be important to also examine the user experience when telehealth equipment is utilized over a longer distance. Specifically, it is possible that video quality may be lower if the signal is being transmitted over great distances. As such, it is recommended that the next step of the study be to test out the effectiveness and logistics when the therapist and participant are in different physical locations.

This study sought to determine what the short-term effectiveness of telehealth was versus the face-to-face modality. As such, one limitation is that it is unknown whether the participants maintained low levels of alcohol use and alcohol problems. It will be important

in future research to assess over a 12 month time period to determine whether treatment gains are retained equally in each condition. This will be particularly important to determine whether the intervention is equally effective for those with comorbid mental health disorders in the long-term. Additionally, the participants in this study were volunteers who were not treatment seeking or mandated to the BASICS intervention. As such, it will be important to replicate these findings in those referred for treatment.

Another future direction of this research should be to test the differential effectiveness of other mental health and alcohol-related interventions when delivered face-to-face versus telehealth. A review of prior literature suggested that these results were consistent with prior findings; however, there remains a paucity of research pertaining to telehealth effectiveness for psychotherapy. It would be particularly useful to determine if longer-term interventions for more significant alcohol use (i.e., those with an alcohol use disorder) would also be effective via the telehealth modality.

In addition, the similar effectiveness of the face-to-face and telehealth modalities may have been at least partially due to the participants' substantial familiarity and comfort with technology. This is to be expected among a college student population where computers are an essential part of the learning process and many individuals have had at least some involvement with video chat programs (e.g., skype). It would be interesting to see if this modality equivalence is maintained in a more diverse age group or with individuals that use technology less frequently. While the BASICS intervention was created exclusively for use with college students, the generalizability of these results to other ages or levels of technology familiarity could be explored with other therapies for alcohol use.

Another consideration is the generalizability of these results to minority populations including ethnic or sexual orientation, as the present study lacked sufficient sample size to effectively address these diversity components. While multiple meta-analyses have been conducted on the effectiveness of the BASICS intervention (e.g., Carey, Scott-Sheldon, Carey, & DeMartini, 2007; Fachini, Alaine, Martinez, & Furtado, 2012; Larimer & Cronce, 2002), none have directly examined the effectiveness of the intervention in ethnic or sexual minorities. Results of one meta-analysis identified that White vs. non-White was not a significant moderator of treatment outcome when examined across a sample of 13,750 college students (Carey, Scott-Sheldon, Carey, & DeMartini, 2007). While these results are encouraging of generalizability for ethnicity, future studies should aim to directly analyze the effectiveness of the intervention among minority groups.

Another limitation of the study is related to the overall rate of attrition. The researcher aimed to recruit a sample size larger than that utilized in previous studies ($N < 40$; Frueh et al., 2007; Gros et al., 2013; Himle et al., 2012; Morland et al., 2010; Morland, Pierce, & Wong, 2004). An a priori power analysis based on Friedman (1982) & Cohen's (1988) recommendations was conducted to determine how many participants would need to be recruited in order to have .80 power and be able to detect a moderate effect (r = .40). Results of the power analysis indicated that a total of 44 participants would be required (22 per condition) to detect differences between the two groups. This goal was achieved, as the researcher successfully recruited 51 individuals who completed the intervention.

While a large enough sample size was obtained to be able to detect the presence of between-group differences, the attrition rate at the 3-month follow-up time point was 70%. The effect size for the intervention in this study was calculated for the RAPI outcome (r =

.6354) and AUDIT outcome (r = .3572). Given these effect sizes, a post-hoc power analysis revealed that sufficient power (.80) was achieved for the effect for RAPI, with a requirement of 13 participants for an effect size of that magnitude. Sufficient power was not obtained for AUDIT, in that a .35 effect size required 59 people for a power level of .80. It is worth noting that despite low power levels for AUDIT, a clinically significant effect (reduction of outcome below problematic alcohol use levels) was achieved for both the AUDIT and RAPI outcome which lends support to the stability of these findings. Nevertheless, a larger sample size in future studies will provide important information about the stability of these findings.

The attrition rate was higher than expected and may have contributed to difficulties with creating a stable model, particularly when multiple predictors and interactions were present. The retention rate may have been low due to the small monetary award provided for completing the study ($5). As such, it is recommended that future studies provide a greater reward to improve retention. Another possibility is that those individuals who were continuing to drink heavily were more likely to not complete the follow-ups than those participants who were doing well. To identify whether this was the case, the mean scores of AUDIT and RAPI were analyzed at each occasion by completion status. Results indicated that the pattern of means was statistically equivalent at all occasions between follow-up completers and non-completers (See Table 4.1). As such, these results can be considered representative of the intervention's effectiveness and not due to a follow-up completer response bias.

Table 4.1

Comparison of Mean AUDIT and RAPI Scores for Follow-up Status

Time	Outcome	Non-Completer	Completer	ANOVA Statistics
Baseline	AUDIT	9.82 (Std = 4.21)	9.15 (Std = 3.31)	F = .264, df = 1,49
		n = 38	n = 13	Mse = 4.244, p = .610
	RAPI	8.03 (Std = 6.52)	8.53 (Std = 8.06)	F = .055, df = 1,49
		n = 36	n = 15	Mse = 2.706, p = .815
1 Month	AUDIT	9.05 (Std = 4.65)	8.08 (Std = 4.27)	F = .375, df = 1,33
		n = 22	n = 13	Mse = 7.665, p = .544
	RAPI	4.78 (Std = 6.18)	2.60 (Std = 3.79)	F = 1.414, df = 1,31
		n = 18	n = 15	Mse = 38.804, p = .243
2 Months	AUDIT	6.70 (Std = 4.95)	8.15 (Std = 5.10)	F = .472, df = 1,21
		n = 10	n = 13	Mse = 11.947, p = .500
	RAPI	1.83 (Std = 1.72)	2.47 (Std = 4.42)	F = .113, df = 1,19
		n = 6	n = 15	Mse = 1.719, p = .740
3 Months	AUDIT	6.00 (Std = 4.24)	7.46 (Std = 4.88)	F = .159, df = 1,13
		n = 2	n = 13	Mse = 3.703, p = .697
	RAPI	1 (Std = N/A)	1.60 (Std = 3.76)	F = .024, df = 1,14
		n = 1	n = 15	Mse = .338, p = .879

This study also provided additional information on the utility of the TPI to measure telepresence. It was determined that telepresence was high in the telehealth condition; however, the measure is still in development and these results should be considered preliminary. To add to the body of literature on the effectiveness of the TPI for this purpose and in this population, a larger sample size (N = 200) is suggested. A latent trait analysis involving measurement and structural invariance may be helpful in identifying response

patterns and which items are most useful for the overall construct. Additionally, the TPI appears to have a wide range of video applicability and thus it may be beneficial to determine which specific subset of questions is most helpful for measuring presence in a telehealth intervention.

Conclusion

The widespread nature of alcohol abuse (American College Health Association, 2006; Cahill & Byrne, 2010; O'Malley & Johnston, 2002b) and the high cost to the individual and society (e.g., Arif & Rohrer, 2005; Baliunas et al., 2009; Hatton et al., 2009; Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002; Office of Community Health Development, 2007) necessitate the availability of effective interventions. This has been difficult to achieve with traditional face-to-face therapy due to 30% of the United States population residing in rural areas (U.S. Census Bureau, 2010) and the lack of qualified providers in rural areas (American Psychological Association, 2001; Baca et al., 2007). This is further complicated by higher rates of binge drinking (Office of Applied Studies, 2003) and greater risks of negative effects of alcohol for those who live in rural areas (Substance Abuse and Mental Health Services Administration, 2012; U.S. Census Bureau, 2011). Prior researchers have identified telehealth as an effective option for disseminating alcohol interventions to individuals residing in rural areas (e.g., Frueh et al., 2005) while others have suggested that telehealth hinders the therapeutic process and therefore will result in poorer outcomes (Swinton, Robinson, & Bischoff, 2009). The author of this study sought to clarify the effectiveness of a brief alcohol intervention for college students when delivered either face-

to-face or in a telehealth condition and how the telehealth modality impacted the therapeutic process.

The results of this study provide evidence to support that the provision of a BMI via telehealth results in similar treatment gains as interventions delivered in a face-to-face condition. In addition, results indicate that the treatment can be provided through the telehealth modality without loss of client satisfaction or therapeutic alliance. It was also determined that the telehealth intervention can closely approximate the feel of a face-to-face interaction if proper equipment is utilized. In sum, it is notable that problematic alcohol use and the subsequent consequences can be reduced regardless of the client or qualified provider's location. Telehealth interventions should be considered as an effective option for all those with barriers to in-person attendance and are comfortable with the use of technology. Future studies should continue to expand on the types of mental health difficulties that may effectively be treated via telehealth as well as identify factors that may render a telehealth treatment more or less effective.

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Appendix

Demographic Information   **Participant ID Number**
_____

Please read through the following questions and either type in the appropriate response or place an 'X' on the line corresponding to the appropriate response.

1. Date: _____

2. Age: _____

3. Gender: Male _____   Female _____

4. Marital Status:

_____ Single; Never married   _____ Separated   _____ Divorced
        _____ Widowed

5. Year in College:

_____ Freshmen   _____ Sophomore   _____ Junior   _____ Senior

_____ Fifth year Senior   _____ Graduate student

6. Race:

_____ White   _____ African American   _____ Middle Eastern
_____ Asian American   _____ Pacific Islander   _____ Latino/a
_____ Native American/ Alaskan Native   _____ Other

7. Ethnicity:

_____ Hispanic   _____ Non-Hispanic   _____ Other

8. Throughout childhood and adolescence I grew up with:

_____ Both parents   _____ Mother only   _____ Father only
_____ Grandparents only   _____ Other

If Other, please explain:

9. How many brothers and sisters do you have?
_____ Brothers   _____ Sisters

10. Please estimate the annual income of your family while you lived at home:

_____ Less than 9,000   _____9,000-14,000   _____ 14,000-20,000
_____ 20,000-35,000   _____ 35,000-60,000   _____ 60,000-100,000
_____ More than 100,000

11. How often have you seen your family over the past 6 months?

_____ Daily   _____ Weekly   _____ Monthly
_____ Less than monthly _____ None

12. What is the population of your home town?

_____ Less than 5,000   _____ 5,000-10,000   _____10,000-50,000
_____ 50,000-100,000   _____ 100,000-500,000   _____ More than
500,000

13. Where do you currently live?

_____ Residence Hall   _____ Apartment or Rented house
        _____Fraternity/Sorority
_____ Own your own house   _____ Live with parents   _____
Other

14. Do you live alone or have a roommate?

_____ Live alone   _____ Have a roommate (s)   _____
Live with a spouse

15. Are you in a fraternity or sorority?

_____ Yes   _____ No

16. Are you presently employed?

_____ Unemployed   _____ Employed 1-20 hours per week
_____ Employed 20-30 hours per week   _____ Employed full time

17. What was your high school grade point average? _____

18. What is your current grade point average? _____

(If this is your first semester as a freshman, please type in your expected gpa.)

19. What is your major? _____

20. How many hours do you spend studying each week? _____

21. How many friends do you have that you regularly spend time with?

_____ None _____ 1 _____ 2-3 _____ 4-10 _____ More than 10

22. Have you ever been diagnosed or treated for the following disorders:
_____ Depression _____ Anxiety _____ Bipolar
_____ Schizophrenia _____ Post-traumatic Stress Disorder
_____ Attention Deficit Hyperactivity Disorder _____ Learning Problems
_____ Alcohol Problems _____ Other drug problems (please specify)

23. Are you currently taking any medication?
_____ Yes _____ No

If yes, what? _____

24. What is your height (in inches)? _____

B. What is your weight (in pounds)? _____

25. Have you ever had any legal trouble because of drinking or drugs?
_____ Yes _____ No

26. Please place an 'X' on the line corresponding to legal problems that you have had:

_____ Driving Under the Influence (DUI or DWI) _____ Minor in Possession (MIP)
_____ Disorderly House _____ Possession of Drug Paraphernalia
_____ Possession of Controlled Substance _____ Possession with intent to deliver
_____ Disturbing the Peace _____ Public Intoxication
_____ Assault-related charge _____ Disorderly Conduct
_____ Other

For each of the following boxes checked please specify
if these problems were juvenile or adult offenses:
_____

27. Have any of the following people in your family ever experienced psychological or emotional problems (one that should have or did result in treatment)?

 If so, please check the family member who has had the problems and indicate in the "How many" query the number of family members when applicable:

_____ Mother	_____ Grandfather/father's side
_____ Father	_____ Sister- How many?
_____ Grandmother/mother's side	_____ Brother- How many?
_____ Grandfather/ mother's side	_____ Aunt- How many?
_____ Grandmother/ father's side	_____ Uncle- How many?

28. Have any of the following people in your family ever experienced a problem with alcohol (one that should have or did result in treatment)?

 If so, please check the family member who has had the problems and indicate in the "How many" query the number of family members when applicable:

_____ Mother	_____ Grandfather/father's side
_____ Father	_____ Sister- How many?
_____ Grandmother/mother's side	_____ Brother- How many?
_____ Grandfather/ mother's side	_____ Aunt- How many?
_____ Grandmother/ father's side	_____ Uncle- How many?

29. Have any of the following people in your family ever experienced a problem with drugs (one that should have or did result in treatment)?

 If so, please check the family member who has had the problems and indicate in the "How many" query the number of family members when applicable:

_____ Mother	_____ Grandfather/father's side
_____ Father	_____ Sister- How many?
_____ Grandmother/mother's side	_____ Brother- How many?
_____ Grandfather/ mother's side	_____ Aunt- How many?
_____ Grandmother/ father's side	_____ Uncle- How many?

30. At what age did you start drinking? _____

Demographic Information   **Participant ID Number**
_____

Please read through the following questions and either type in the appropriate response or place an 'X' on the line corresponding to the appropriate response.

1. Date: _____

2. What is your current grade point average? _____
(If this is your first semester as a freshman, please type in your expected gpa.)

3. In the last month, have you had any legal trouble because of drinking or drugs?
        _____ Yes   _____ No

4. If so, please place an 'X' on the line corresponding to legal problems that you have had:

_____ Driving Under the Influence (DUI or DWI)   _____ Minor in Possession
(MIP)
_____ Disorderly House   _____ Possession of Drug
Paraphernalia
_____ Possession of Controlled Substance   _____ Possession with intent
to deliver
_____ Disturbing the Peace   _____ Public Intoxication
_____ Assault-related charge   _____ Disorderly Conduct
_____ Other

For each of the following boxes checked please specify
 if these problems were juvenile or adult offenses:
_____

Modified Daily Drinking Questionnaire

ONE STANDARD DRINK= 1 shot or mixed drink, 5 oz. wine or 1 cooler, 10-12 oz.beer

1. For the PAST MONTH, please describe a TYPICAL DRINKING WEEK. For each day, fill in the number of STANDARD DRINKS of each type of alcohol you consumed on that day and the TYPICAL NUMBER OF HOURS you drank on that day.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Beer?							
Wine?							
Spirits?							
Hours?							

2. Think of the one occasion during the PAST MONTH when you drank the most. Fill in the number of standard drinks of each type you consumed.

Beer?	
Wine?	
Spirits?	
Hours?	

3. Think about the number of blood relatives who are now, or have been in the past, problem drinkers or alcoholics?

	NUMBER
Number of parents?	
Number of brothers or sisters?	
Number of grandparents?	
Number of uncles or aunts?	
Number of first cousins?	

4. During the PAST MONTH, how many days did you drive a vehicle shortly after having three or more drinks? _____

5. During the PAST MONTH, how many days were you a passenger in a vehicle when the driver had three or more drinks? _____

6. How much would you estimate you spend on alcoholic beverages per week? _$_____

7. For each of the following, estimate how common these behaviors are:
    What percent of U.S. college students (same sex) drink more than you?
    _____

What percent of U.S. college students do not drink at all in a typical week?
_____

What percent of U.S. college students have two drinks or fewer in a typical week?
_____

What percent of U.S. college students smoke marijuana at least once a year? -
_____

8. During the PAST MONTH, how many cigarettes did you smoke on a typical day?
_____

9. If a smoker, for how many years have you smoked regularly?
_____

10. After school expenses, how much money do you have to spend in an average month?
__$_____

AUDIT

One drink equals: *12 oz. beer = 5 oz. wine = 1shot liquor = mixed drink w/ 1 shot liquor*
Mark the circle that reflects your drinking in the past year.

---

1. How often do you have a drink containing alcohol?   Days per week
    ○Never   ○Monthly or less   ○2 to 4 times a month   ○2   ○3   ○4   ○5   ○6   ○7

---

2. How many drinks containing alcohol do you have on a typical day when you are drinking?
        ○None   ○1   ○2   ○3   ○4   ○5   ○6   ○7   ○8   ○9   ○10   ○11   ○12+

---

3. For women: How often do you have 4 or more drinks a day?
    For men: How often do you have 5 or more drinks a day?
        ○Never   ○Less than monthly   ○Monthly   ○Weekly   ○Daily or almost daily

---

4. How often during the last year have you found that you were not able to stop drinking once you started?
        ○Never   ○Less than monthly   ○Monthly   ○Weekly   ○Daily or almost daily

---

5. How often during the last year have you failed to do what was normally expected from you because of drinking?
        ○Never   ○Less than monthly   ○Monthly   ○Weekly   ○Daily or almost daily

---

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
        ○Never   ○Less than monthly   ○Monthly   ○Weekly   ○Daily or almost daily

---

7. How often during the last year have you had a feeling of guilt or remorse after drinking?
        ○Never   ○Less than monthly   ○Monthly   ○Weekly   ○Daily or almost daily

---

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?
        ○Never   ○Less than monthly   ○Monthly   ○Weekly   ○Daily or almost daily

---

9. Have you or has someone else been injured as a result of your drinking?
        ○No   ○Yes, but not in the last year   ○Yes, during the last year

---

10. Has a relative or a friend or a doctor or health worker been concerned about your drinking or suggested you cut down?
        ○No   ○Yes, but not in the last year   ○Yes, during the last year

RUTGERS ALCOHOL PROBLEM INDEX

RAPI (23-item version)

Different things happen to people while they are drinking ALCOHOL or because of their ALCOHOL drinking. Several of these things are listed below. Indicate how many times each of these things happened to you WITHIN THE LAST YEAR.

Use the following code:
0 = None
1 = 1-2 times
2 = 3-5 times
3 = More than 5 times

HOW MANY TIMES HAS THIS HAPPENED TO YOU WHILE YOU WERE DRINKING OR BECAUSE OF YOUR DRINKING DURING THE LAST YEAR?

0 1 2 3 Not able to do your homework or study for a test
0 1 2 3 Got into fights with other people (friends, relatives, strangers)
0 1 2 3 Missed out on other things because you spent too much money on alcohol
0 1 2 3 Went to work or school high or drunk
0 1 2 3 Caused shame or embarrassment to someone
0 1 2 3 Neglected your responsibilities
0 1 2 3 Relatives avoided you
0 1 2 3 Felt that you needed more alcohol than you used to in order to get the same
        effect
0 1 2 3 Tried to control your drinking (tried to drink only at certain times of the day or in
        certain places, that is, tried to change your pattern of drinking)
0 1 2 3 Had withdrawal symptoms, that is, felt sick because you stopped or cut down on
        drinking
0 1 2 3 Noticed a change in your personality
0 1 2 3 Felt that you had a problem with alcohol
0 1 2 3 Missed a day (or part of a day) of school or work
0 1 2 3 Wanted to stop drinking but couldn't
0 1 2 3 Suddenly found yourself in a place that you could not remember getting to
0 1 2 3 Passed out or fainted suddenly
0 1 2 3 Had a fight, argument or bad feeling with a friend
0 1 2 3 Had a fight, argument or bad feeling with a family member
0 1 2 3 Kept drinking when you promised yourself not to
0 1 2 3 Felt you were going crazy
0 1 2 3 Had a bad time
0 1 2 3 Felt physically or psychologically dependent on alcohol
0 1 2 3 Was told by a friend, neighbor or relative to stop or cut down drinking

RTC Questionnaire

Please read the sentence below carefully. For each one please check the answer that best describes how you feel.

	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
1. My alcohol use is okay as it is.	☐	☐	☐	☐	☐
2. I am trying to use less Alcohol than I used to.	☐	☐	☐	☐	☐
3. I enjoy my Alcohol but sometimes I use too much.	☐	☐	☐	☐	☐
4. I should cut down on my Alcohol use.	☐	☐	☐	☐	☐
5. It's a waste of time thinking about my Alcohol use.	☐	☐	☐	☐	☐
6. I have just recently changed my Alcohol habits.	☐	☐	☐	☐	☐
7. Anyone can talk about wanting to do something about using Alcohol, but I am actually doing something about it.	☐	☐	☐	☐	☐
8. I am at the stage where I should think about using less Alcohol.	☐	☐	☐	☐	☐
9. My Alcohol use is a problem.	☐	☐	☐	☐	☐
10. It's alright for me to keep drinking as I do now.	☐	☐	☐	☐	☐
11. I am actually changing my Alcohol habits right now.	☐	☐	☐	☐	☐
12. My life would still be the same, even if I drank less.	☐	☐	☐	☐	☐

On a scale of 0 to 10, how **IMPORTANT** is it for you right now to change?

0____1____2____3____4____5____6____7____8____9____10
Not at all   Extremely
Important   Important

On a scale of 0 to 10, how **CONFIDENT** are you that you could make this change?

0____1____2____3____4____5____6____7____8____9____10
Not at all   Extremely
Confident   Confident

FEEDBACK QUIZ

Name: _____   Date:
_____

1. The calories in a Long Island Ice Tea are equal to a _____ of cookie dough ice cream while _____ light beers equal the calories in a McDonald's cheeseburger.

2. It would take you _____ hours to return to a BAC of .00 after reaching your typical weekly BAC high.

3. Please list some of the effects you may experience at your highest BAC during a typical week:

4. Please summarize both the good and bad alcohol effects you expect "would happen" when you drink:

5. For UNL students, the actual drinking norm is _____ occasions per week and _____ drinks per occasion.

6. True or False: Those with a family history of alcohol problems are at a higher risk for serious alcohol problems if they drink. _____

7. Please list both the number of times you drove after drinking and the number of times you rode with a drinking driver in the past month:

8. Based on your typical weekly peak BAC, you are _____ times more likely to be in a fatal car crash if drinking and driving.

9. According to the information provided, you spend $ _____ per year on alcohol.

10. Please summarize the types of problems you have had related to alcohol, such as those listed on the RAPI and Alcohol-Related Life Problems:

11. Please summarize your understanding of your alcohol-related risk based upon scores on the MAST, Ph and AUDIT:

12. Using information in your feedback sheet such as BAC and problems you report experiencing, does your level of concern and perceived risk "match"? Please explain:

Internet Usage Questionnaire

1. Which of the following best describes how often you use the Internet (e.g., checking e-mail, social networking, playing games, reading news or blogs, Google searches)?

1	2	3	4	5
Almost never	Once in a while	Daily	Multiple times per day	Constantly, or nearly so

2. How much time do you spend on the Internet on a typical day when you use it?

1	2	3	4	5
Less than one hour	1-2 hours	3-5 hours	6-12 hours	More than 12 hours

3. Which type of device do you use the most for online activities?

1	2	3
Desktop computer	Laptop computer	Tablet or mobile phone

4. Considering your Internet use in the **past month**, how often did you engage in the following activities?

	Never/Almost Never	Rarely	Occasionally	Somewhat Frequently	Very Frequently
Information gathering					
Google or other search engine searches	O	O	O	O	O
Viewing news articles or videos	O	O	O	O	O
Looking up the weather, directions, recipes, etc.	O	O	O	O	O
Work/school					
Research for work or class assignments	O	O	O	O	O
E-mailing classmates, professors, coworkers, or employers	O	O	O	O	O
Updating electronic records	O	O	O	O	O
Social					

Browsing, posting, and commenting on social networking sites (e.g., Facebook, Twitter)	○	○	○	○	○
Instant messaging (e.g., Facebook, Skype, Gchat)	○	○	○	○	○
Video chatting (e.g., Skype, FaceTime)	○	○	○	○	○
Online dating (e.g., OkCupid, Match.com)	○	○	○	○	○
E-mailing friends or family	○	○	○	○	○

Entertainment

Streaming media (e.g., Netflix, YouTube, podcasts, Pandora)	○	○	○	○	○
Reading blogs	○	○	○	○	○
Viewing user-submitted content sites (e.g., Reddit, Tumblr, Imgur)	○	○	○	○	○
Playing online, single-player games	○	○	○	○	○
Playing online, multiplayer games	○	○	○	○	○

5. In the past month, how often did you use the Internet to communicate with the following people?

	Never/Almost Never	Rarely	Occasionally	Somewhat Frequently	Very Frequently
Family members	○	○	○	○	○
Close friends	○	○	○	○	○
Acquaintances	○	○	○	○	○
People you met on the Internet (not in person)	○	○	○	○	○
Professors or employers	○	○	○	○	○
Groups or organizations	○	○	○	○	○

6. Which of the following best describes your Internet usage?
a. I use the Internet to communicate minimally, and my social life is almost exclusively in person.
b. I often use the Internet to communicate, but my social life mainly takes place in person.
c. About half of my social life is online, and half of my social life is in person.
d. I spend a lot of time communicating on the Internet, and most of my social life is online.
e. My social life is almost entirely on the Internet.

7. How satisfied are you with how well your current pattern of Internet use meets your social needs?

1	2	3	4	5
Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied

MONITORING DRINKING

USE THE FOLLOWING CHART TO MONITOR YOUR DRINKING FOR THE COMING WEEK BEGINNING WITH TODAY. TRY TO BE AS ACCURATE AS POSSIBLE AND RECORD YOUR DRINKING AS NEAR AS POSSIBLE TO THE TIME YOU TOOK THE DRINK. NOTE THE "ONE DRINK" GIVEN AT THE BOTTOM OF THE MONITORING SHEET. RECORD THE AMOUNT OF TIME YOU SPENT DRINKING IN A SINGLE SITTING. FOR EXAMPLE, RECORD A SINGLE EPISODE OF DRINKING, WITH WHOM YOU HAD THE DRINK, WHERE YOU HAD THE DRINK AND WHAT THE ALCOHOLIC BEVERAGE WAS.

	WHAT DRINK	WITH WHOM	*HOW MUCH	TIME SPENT	WHERE
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
SATURDAY					
SUNDAY					

*RECORD IN DRINKS TAKEN, WHERE ONE BEER, ONE GLASS OF WINE AND A SHOT OF LIQUOR OR A MIXED DRINK EACH EQUAL ONE DRINK.

Motivational Interviewing Treatment Integrity Code (MITI) Coding Sheet
Tape #: _____ **Coder:_____ Date:_____**

Global Ratings

Evocation		1 Low	2	3	4	5 High
Collaboration		1 Low	2	3	4	5 High
Autonomy/ Support		1 Low	2	3	4	5 High
Direction		1 Low	2	3	4	5 High
Empathy		1 Low	2	3	4	5 High

Behavioral Counts

Giving Information			
MI Adherent	**Asking permission, affirm, emphasize control, support.**		
MI Non-adherent	**Advise, confront, direct.**		
Question (subclassify)	**Closed Question**		
	Open Question		
Reflect (subclassify)	**Simple**		
	Complex		
	TOTAL REFLECTIONS:		

First Sentence: _____

Last Sentence: _____

SUQ   Participant Id Number _____

1. Do you smoke cigarettes now?

a. IF YES, on average, how many cigarettes do you usually smoke a day? (1 pack=20 cigarettes)
_____

b. If you do not smoke every day, how many cigarettes do you usually smoke per week?
_____

2. Have you ever tried any of the following substances? If yes, please place an 'X' the ones you have tried:

Marijuana/hashish _____   Ecstasy _____
Cocaine (crack) _____   Inhalants _____
Heroin _____   Methadone _____
Barbiturates _____   LSD/ Hallucinogens _____
Amphetamines _____   Other Opiates/Analgesics (codeine, oxycontin,
Other Sedatives/Tranquilizers/Hypnotics _____   darvon, vicodin, dilavdid, demerol)
                                         _____
ADHD medications (Adderall, Ritalin, Dexedrine) _____ K2
                                         _____
Alcoholic Energy Drinks _____

3. In the PAST 6 MONTHS, how often have you used the following substances?

Marijuana/Hashish:

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

Amphetamines (meth, crank):

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

Cocaine or crack:

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

LSD or hallucinogens:

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly		None/Never

				Less than one/month	

Ecstasy (NMDA):

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

Heroin:

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

Other opiates/analgesics (codeine, oxycontin, darvon, vicodin, dilavid, Demerol):

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

Methadone:

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

Barbiturates:

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

Other sedatives/hypnotics/tranquilizers:

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

Inhalants:

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

ADHD medications (Adderall, Ritalin, Dexedrine):

_____	_____	_____	_____	_____	_____
Several times/day	Daily	Weekly	Monthly	Less than one/month	None/Never

K2:

_____ Several times/day	_____ Daily	_____ Weekly	_____ Monthly	_____ Less than one/month	_____ None/Never

Alcoholic Energy Drinks:

_____ Several times/day	_____ Daily	_____ Weekly	_____ Monthly	_____ Less than one/month	_____ None/Never

Working Alliance Inventory – Short Revised (WAI-SR)

Instructions: Below is a list of statements and questions about experiences people might have with their therapy or therapist. Some items refer directly to your therapist with an underlined space -- as you read the sentences, mentally insert the name of your therapist in place of _____ in the text. Think about your experience in therapy, and decide which category best describes your own experience.

IMPORTANT!!! Please take your time to consider each question carefully.

1. As a result of these sessions I am clearer as to how I might be able to change.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

2. What I am doing in therapy gives me new ways of looking at my problem.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

3. I believe___likes me.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

4. ___and I collaborate on setting goals for my therapy.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

5. ___and I respect each other.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

6. ___and I are working towards mutually agreed upon goals.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

7. I feel that___appreciates me.

①	②	③	④	⑤
Seldom	Sometimes	Fairly Often	Very Often	Always

8. _____ and I agree on what is important for me to work on.

⑤	④	③	②	①
Always	Very Often	Fairly Often	Sometimes	Seldom

9. I feel _____ cares about me even when I do things that he/she does not approve of.

    ①   ②   ③   ④   ⑤

Seldom   Sometimes   Fairly Often   Very Often   Always

10. I feel that the things I do in therapy will help me to accomplish the changes that I want.

    ⑤   ④   ③   ②   ①

Always   Very Often   Fairly Often   Sometimes   Seldom

11. _____ and I have established a good understanding of the kind of changes that would be good for me.

    ⑤   ④   ③   ②   ①

Always   Very Often   Fairly Often   Sometimes   Seldom

12. I believe the way we are working with my problem is correct.

    ①   ②   ③   ④   ⑤

Seldom   Sometimes   Fairly Often   Very Often   Always

Note: Items copyright © Adam Horvath. Goal Items: 4, 6, 8, 11; Task Items: 1, 2, 10, 12; Bond

Items: 3, 5, 7, 9

A LITERATURE-BASED PRESENCE MEASUREMENT INSTRUMENT:
THE TEMPLE PRESENCE INVENTORY (TPI) (BETA)

The Temple Presence Inventory (TPI) is a new tool to measure dimensions of (tele)presence.

The TPI:

- Contains items culled from a comprehensive literature review of presence theory and research
- Has been developed and validated using traditional psychological measurement procedures
- Is appropriate for use with most media and media content
- Measures diverse presence dimensions including several types of social presence
- Is free

Please use the entire inventory, sets of items for specific dimensions, and/or individual items, as you deem useful and appropriate in your research. Feel free to modify items as needed. All that we (Matthew Lombard and Theresa Ditton) ask is that you help refine the instrument by reporting on your experience using all or part of the TPI. Please direct reports of use and/or questions to Matthew Lombard at lombard@temple.edu.

SPATIAL PRESENCE:

VAR NAME	LDNG	ITEM
PLACE	.89	How much did it seem as if the objects and people you saw/heard had come to the place you were? (Not at all - Very much [7 points])
TOUCH	.88	How much did it seem as if you could reach out and touch the objects or people you saw/heard? (Not at all - Very much [7 points])
OBJECT	.83	How often when an object seemed to be headed toward you did you want to move to get out of its way? (Never - Always [7 points])
BETHERE	.79	To what extent did you experience a sense of being there inside the environment you saw/heard? (Not at all – Very much [7 points])
SNDLOCAL	.72	To what extent did it seem that sounds came from specific different locations? (Not at all - Very much [7 points])
TOUCHSMG	.68	How often did you want to or try to touch something you saw/heard? (Never - Always [7 points])

VAR NAME	LDNG	ITEM
WINDOW	.58	Did the experience seem more like looking at the events/people on a movie screen or more like looking at the events/people through a window? (Like a movie screen – Like a window [7 points])

EIGENVALUE:	4.19
VARIANCE EXPLAINED:	59.85
STANDARDIZED CRONBACH'S ALPHA:	.91

SOCIAL PRESENCE - ACTOR W/I MEDIUM (PARASOCIAL INTERACTION):

VAR NAME	LDNG	ITEM
PPLSEEU	.83	How often did you have the sensation that people you saw/heard could also see/hear you? (Never - Always [7 points])
INTERACT	.82	To what extent did you feel you could interact with the person or people you saw/heard? (None - Very much [7 points])
LEFTPLCE	.79	How much did it seem as if you and the people you saw/heard both left the places where you were and went to a new place? (Not at all - Very much [7 points])
TOGETHER	.78	How much did it seem as if you and the people you saw/heard were together in the same place? (Not at all - Very much [7 points])
TALKTOYU	.77	How often did it feel as if someone you saw/heard in the environment was talking directly to you? (Never - Always [7 points])
EYECONT	.68	How often did you want to or did you make eye-contact with someone you saw/heard? (Never - Always [7 points])
CONTRINT	.67	Seeing and hearing a person through a medium constitutes an interaction with him or her. How much control over the interaction with the person or people you saw/heard did you feel you had? (None - Very much [7 points])

EIGENVALUE:	4.08
VARIANCE EXPLAINED:	58.24
STANDARDIZED CRONBACH'S ALPHA:	.90

SOCIAL PRESENCE - PASSIVE INTERPERSONAL:

VAR NAME	LDNG	ITEM
FACEEXPR	.89	During the media experience how well were you able to observe the facial expressions of the people you saw/heard? (Not well - Very well [7 points])

TONEVOIC	.85	During the media experience how well were you able to observe the changes in tone of voice of the people you saw/heard? (Not well - Very well [7 points])
STYLDRES	.79	During the media experience how well were you able to observe the style of dress of the people you saw/heard? (Not well - Very well [7 points])
BODYLANG	.69	During the media experience how well were you able to observe the body language of the people you saw/heard? (Not well - Very well [7 points])

EIGENVALUE: 2.61
VARIANCE EXPLAINED: 65.27
STANDARDIZED CRONBACH'S ALPHA: .88

SOCIAL PRESENCE - ACTIVE INTERPERSONAL:

VAR NAME	LDNG	ITEM
MKSOUND	.84	How often did you make a sound out loud (e.g. laugh or speak) in response to someone you saw/heard in the media environment? (Never - Always [7 points])
SMILE	.73	How often did you smile in response to someone you saw/heard in the media environment? (Never - Always [7 points])
SPEAK	.61	How often did you want to or did you speak to a person you saw/heard in the media environment? (Never - Always [7 points])

EIGENVALUE: 1.61
VARIANCE EXPLAINED: 53.51
STANDARDIZED CRONBACH'S ALPHA: .77

ENGAGEMENT (MENTAL IMMERSION):

VAR NAME	LDNG	ITEM
MENTALIM	.86	To what extent did you feel mentally immersed in the experience? (Not at all - Very much [7 points])
INVOLVNG	.80	How involving was the experience? (Not at all - Very much [7 points])
SENSEENG	.79	How completely were your senses engaged? (Not at all - Very much [7 points])
SENSREAL	.79	To what extent did you experience a sensation of reality? (Not at all - Very much [7 points])
EXCITING	.75	How relaxing or exciting was the experience? (Very relaxing - Very exciting [7 points])

ENGSTORY .65   How engaging was the story?
                    (Not at all - Very much [7 points])

EIGENVALUE:	3.61
VARIANCE EXPLAINED:	60.10
STANDARDIZED CRONBACH'S ALPHA:	.90

SOCIAL RICHNESS:

VAR NAME	LDNG	ITEM
REMOTE	.85	Please circle the number that best describes your evaluation of the media experience: Remote - Immediate (7 points)
UNEMOTNL	.83	Please circle the number that best describes your evaluation of the media experience: Unemotional - Emotional (7 points)
UNRESPON	.82	Please circle the number that best describes your evaluation of the media experience: Unresponsive - Responsive (7 points)
DEAD	.80	Please circle the number that best describes your evaluation of the media experience: Dead - Lively (7 points)
IMPERSNL	.78	Please circle the number that best describes your evaluation of the media experience: Impersonal - Personal (7 points)
INSENSTV	.76	Please circle the number that best describes your evaluation of the media experience: Insensitive - Sensitive (7 points)
UNSOCBLE	.76	Please circle the number that best describes your evaluation of the media experience: Unsociable - Sociable (7 points)

EIGENVALUE:	4.48
VARIANCE EXPLAINED:	63.99
STANDARDIZED CRONBACH'S ALPHA:	.93

SOCIAL REALISM:

VAR NAME	LDNG	ITEM
WOULDOCR	.87	The events I saw/heard would occur in the real world (Strongly disagree - Strongly agree [7 points])
COULDOCR	.76	The events I saw/heard could occur in the real world (Strongly disagree - Strongly agree [7 points])
OCRWORLD	.53	The way in which the events I saw/heard occurred is a lot like the way they occur in the real world (Strongly disagree - Strongly agree [7 points])

EIGENVALUE:	1.60
VARIANCE EXPLAINED:	53.34
STANDARDIZED CRONBACH'S ALPHA:	.75

PERCEPTUAL REALISM:

VAR NAME	LDNG	ITEM
FEELLIKE	.80	Overall how much did touching the things and people in the environment you saw/heard feel like it would if you had experienced them directly? (Not at all - Very much [7 points])
TEMPERAT	.74	How much did the heat or coolness (temperature) of the environment you saw/heard feel like it would if you had experienced it directly? (Not at all - Very much [7 points])
SMELLIKE	.70	Overall, how much did the things and people in the environment you saw/heard smell like they would had you experienced them directly? (Not at all - Very much [7 points])
LOOKLIKE	-	Overall, how much did the things and people in the environment you saw/heard look they would if you had experience them directly (Not at all - Very much [7 points])
SOUNDLKE	-	Overall, how much did the things and people in the environment you saw/heard sound like they would if you had experienced them directly? (Not at all - Very much [7 points])

EIGENVALUE: 1.67
VARIANCE EXPLAINED: 55.71
STANDARDIZED CRONBACH'S ALPHA: .79

_____

Client Satisfaction Questionnaire (CSQ-8)

Please help us improve our program by answering some questions about the services you have received. We are interested in your honest opinions, whether they are positive or negative. *Please answer all of the questions.* We also welcome your comments and suggestions. Thank you very much; we really appreciate your help.

Circle your answer:

1. **How would you rate the quality of service you have received?**

4	3	2	1
Excellent	Good	Fair	Poor

2. **Did you get the kind of service you wanted?**

1	2	3	4
No, definitely	No, not really	Yes, generally	Yes, definitely

3. **To what extent has our program met your needs?**

4	3	2	1
Almost all of my needs have been met	Most of my needs have been met	Only a few of my needs have been met	None of my needs have been met

4. **If a friend were in need of similar help, would you recommend our program to him or her?**

1	2	3	4
No, definitely not	No, I don't think so	Yes, I think so	Yes, definitely

5. **How satisfied are you with the amount of help you have received?**

1	2	3	4
Quite dissatisfied	Indifferent or mildly dissatisfied	Mostly satisfied	Very satisfied

6. Have the services you received helped you to deal more effectively with your problems?

4	3	2	1
Yes, they helped a great deal	Yes, they helped	No, they really didn't help	No, they seemed to make things worse

7. In an overall, general sense, how satisfied are you with the service you have received?

4	3	2	1
Very satisfied	Mostly satisfied	Indifferent or mildly dissatisfied	Quite dissatisfied

8. If you were to seek help again, would you come back to our program?

1	2	3	4
No, definitely not	No, I don't think so	Yes, I think so	Yes, definitely

224 Burnett Hall	IRB #	University of Nebraska
P.O. Box 880311	Date Approved:	Lincoln
Lincoln, NE 68588-0311	Valid Until:	
Telephone (402) 472-3197		

Please type your Participant ID Number _____

INFORMED CONSENT FOR RESEARCH PARTICIPATION

As part of your research participation, you will be asked to fill out a variety of questionnaires. Questions about your age, gender, marital status, year in college, ethnicity, and family income will be asked. Additional information may be asked for including information about alcohol consumption, use of other substances, mental health, and legal problems. If there are any questions you prefer not to answer, you may indicate that on the survey. No identifying information will be included with your responses. Research participation is voluntary and you may withdraw from the study at anytime.

Participation in this research requires that you have had at least one occasion in the last two weeks where you drank at least a specified amount of alcohol. This amount is defined as 4 or more drinks for women or five or more drinks for men on one drinking occasion. If you do not meet these criteria, you are unable to participate in this research.

Research participation will include both on-line and in-person participation. You will be asked to fill out some questionnaires that will take approximately 45 minutes to complete. Within one week of completion, you will be contacted via email to schedule two in-person sessions that will be one week apart, each lasting approximately 45 minutes. Following each in-person participation session, you will be asked to fill out a few brief questionnaires online which will take approximately 10 minutes to complete. You will be contacted via e-mail at one, two, and three months post study participation to again ask you to fill out a few brief questionnaires online. Each of the follow-ups will take approximately 15 minutes of your time. Overall, study participation will require approximately 3 and a half hours of your time, resulting in a total of 7 credits earned towards research. If you complete all parts of the study, you will receive a $5 reward pending completion of the final follow-up questionnaires.

All data is being collected through the Qualtrics system which utilizes Transport Layer Security encryption. Data will be de-identified and stored on a secured ftp server which can only be accessed by researchers. Data may be kept for up to ten years following study completion and will then be destroyed. All data utilized in publications to professional journals, presentations at professional meetings, or for grant preparations will be collective averages and not individually identifiable.

All sessions will be audio recorded to assess the standardization of the intervention. Audio recordings will be maintained for no longer than one year and will then be erased. Only researchers will have access to the audio recordings.

A benefit to you for participating is contributing to research which may allow for greater alcohol intervention access for college students. While there are no unforeseen risks to participation in the study, some of the questions may be uncomfortable to answer. Please contact the Psychological Consultation Center (402)-472-2351 or Counseling and Psychological Services (402)472-7450 if you notice any concerns related to negative feelings and would like to seek treatment. Please be aware that costs are generally associated with mental health treatment and any costs are your responsibility.

If you have any questions about the research, you may ask one of the research assistants or contact the investigators listed at the bottom of the consent form. Questions about your rights as a research participant or to report concerns about the study should be addressed to the UNL Institutional Review Board, telephone (402) 472-6965.

By marking this box, you agree that you are voluntarily participating in this research and have read and understood the provided information. Please note that a paper copy of this consent form will be provided at your first research meeting and a signature will be required at that time. You may also print a copy of the electronic consent form for your records.

_____
Printed Name of Participant

_____   _____
Signature of Participant   Date

_____   _____
Signature of Researcher/Witness   Date

Name and Telephone Number of Investigators:

    Sarah King M.A., Principal Investigator

    Dennis E. McChargue, Ph.D., Secondary Investigator   (402) 472-3197