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Personality Trait Interactions With Narrator Empathy In A Brief Computerized Intervention

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PERSONALITY TRAIT INTERACTIONS WITH NARRATOR EMPATHY

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Chapter 1

Overview

Computer-delivered, brief interventions (CDBIs) have become an increasingly common way used to treat substance use problems (Copeland & Martin, 2004). These interventions vary widely across a variety of dimensions including theoretical orientation, presence of a narrator, use of video, and many others (Portnoy et al, 2008). Despite this variability, few studies have examined which elements of CDBIs are most strongly associated with therapeutic change.

One CDBI component that may increase efficacy is the use of common factors. Common factors are aspects of a therapist's interpersonal style (e.g. empathy, positive regard, ability to form an alliance, etc.) that increase therapeutic efficacy across all theoretical orientations (Davis & Piercy, 2007). While common factors produce positive outcomes in in-person interventions (Norcross & Wampold, 2011), almost no studies have examined whether common factors are applicable to *computerized* interventions (e.g., can a computer program express empathy or positive regard? Do clients form 'relationships' with computers?). Moreover, very few studies have examined whether client characteristics influence responses to common factors (e.g. does therapist empathy have more of an effect on high vs. low empathy clients?).

The current study addressed these issues by administering two versions of a CDBI to 67 undergraduates who reported heavy alcohol use. One version of the CDBI included a high empathy narrator and the other included a low empathy narrator. Analyses examined (1) whether the high empathy narrator produced greater motivation and intentions to reduce alcohol use than the low-empathy narrator and (2) whether

participant characteristics (empathy, big five traits, therapeutic reactance) interacted with narrator empathy to predict motivation and intention to change.

Computerized-Delivered, Brief Interventions

Twenty five percent of United States residents, age 12 and older, report past month binge drinking, and 8.5% of U.S. adults (age 18 and older), have an alcohol use disorder (National Survey on Drug Use and Health, 2012; American Psychiatric Association, 2013). However, the vast majority of these individuals will neither seek nor receive treatment (National Survey on Drug Use and Health, 2012). Barriers to treatment are numerous and include cost, transportation problems, lack of time, and lack of trained providers (National Survey on Drug Use and Health, 2012). Thus, while intensive therapy for substance abusers is ideal, it is often unrealistic.

Computer-delivered, brief interventions help to break down many of these barriers. CDBIs are inexpensive, and portable, and can be administered in the absence of a trained therapist (e.g. through the internet or on a laptop computer). CDBIs are also effective, yielding small but significant effect sizes across multiple meta-analyses (Gainsbury & Blaszczynski, 2011; Khadjesari et al., 2011; Portnoy et al., 2008). Moreover, studies comparing CDBIs to in-person, brief interventions have found small to no differences associated with treatment modality (Schwartz et al, 2014; Cadigan et al, 2015); and some data suggest that clients are more likely to disclose sensitive information to a computer program than to a therapist or interviewer (Tourangeau & Yan, 2007; Simoes et al, 2006). For example, Tourangeau and Yan (2007) reviewed seven studies which compared rates of substance use disclosure obtained by in-person

interviews versus computer-assisted self-administration and found that, on average, respondents were 30% more likely to report drug use during computer-assisted self-administrations. Other, more recent studies have yielded similar results in a variety of settings (e.g. Lind, Schober, Conrad & Reicher, 2013).

The Role of Common Factors in CDBIs

There are many types of CDBIs which vary in terms of theoretical orientation, length, use of sound, use of videos, and many other characteristics (Portnoy et al, 2008). Despite this, very few studies have examined which specific characteristics of CDBIs are most associated with change. One CDBI component which may increase treatment efficacy is the use of common factors. The concept of common factors was first proposed by Rosenzweig (1936), who argued that factors independent of theoretical orientation influence therapeutic outcome. He pointed out that different forms of psychotherapy often have similar rates of success, and stated that, instead of debating which type of therapy is most efficacious, we should examine commonalities across different treatments which make therapy beneficial. For example, therapist qualities (such as being empathic, stimulating or inspiring) influence whether an individual performs well in treatment, regardless of the therapist's theoretical orientation. Rosenzweig concluded that clients will benefit if they have an effective therapist who practices a type of treatment in which he or she is proficient.

Today, a great deal of evidence still suggests that (1) there are few differences in the efficacy of different types of treatment, and (2) common factors increase therapeutic effectiveness across all treatment modalities. More specifically, several recent meta-

analyses have found no differences in the long-term effectiveness of different types of psychotherapy (Marcus et al, 2014; Cuijpers et al, 2011). Moreover, therapists who are perceived by their clients to possess certain personality traits (positivity, friendliness, patience, and cultural competence) tend to have better outcomes than those without these traits (Beutler et al, 2003; Davis & Piercy, 2007). .

One common factor which has repeatedly been associated with therapeutic success in substance use treatment is empathy, or the ability to relate to the internal experience of another person. Several studies have found that perception of the therapist as empathetic explains a substantial proportion of the variance in treatment outcome (e.g., Moyers et al, 2016; Greenberg et al, 2001; Miller & Baca, 1983). Specifically, clients who perceive their therapist to be empathetic tend to have fewer negative drinking consequences, become less physically dependent on alcohol throughout treatment (Ritter et al, 2002), and remain abstinent from their drug of choice for longer periods of time (Pantalon et al, 2004; Firoentine & Hillhouse, 1999). In contrast, confrontational therapists often foster resistance among their patients, which frequently leads to high relapse rates (Boardman et al, 2006; Moyers & Miller, 2013). For example, Ritter and colleagues (2002) asked 161 clients in a relapse prevention program to complete surveys assessing perceived therapist qualities (empathy, positive regard, trustworthiness, congruence). Results showed that higher perceived therapist empathy was associated with better drinking outcomes at 3-month follow-up, even after controlling for client cognitive functioning and skill acquisition. Similarly, Firoentine and Hillhouse (1999) assessed perceived therapist empathy and substance use outcomes among 356 clients completing outpatient drug treatment programs. Results showed

that perceived therapist empathy was significantly associated with both engagement in therapy and length of abstinence eight months after beginning therapy.

Notably, while empathy has been associated with better *in-person* treatment outcomes, it is not clear whether empathy is relevant to computer delivered interventions. More specifically, it is not clear whether making a computer program more empathic will enhance its efficacy, or whether clients can form a 'relationship' with a computerized narrator in the same way they do with an in-person therapist.

Recent data from the field of human-computer interaction has begun to address these questions. Specifically, data suggest that (1) humans can, in fact, interact with computers in social ways and (2) computer programs that incorporate common factors are often more effective than those that don't. For example, Bickmore, Gruber and Picard (2005) assigned 60 participants to work with one of three computer programs designed to promote exercise; a relational program, a non-relational program and a control condition. The relational program contained an animated narrator who used social dialogue, empathetic feedback, humor, use of first name, and a variety of other, relational behaviors. The non-relational program contained an animated narrator who provided information about exercise in the absence of relational behaviors (i.e., she did not provide empathy, humor, dialogue, etc). The control condition contained informational content, but no animated narrator. Results showed that participants assigned to the relational program exercised more days per week and expressed a stronger desire to maintain their exercise regimen than participants in the non-relational and control groups.

In a similar study, Kaplan, Farzanfar and Friedman (2003) conducted a pilot trial

aimed at evaluating the helpfulness and acceptability of a telephone-based, automated intervention called the telephone-linked care system (TLC). The TLC was designed to promote healthy eating and physical activity and provided participants with support, and personalized information about maintaining a healthy lifestyle. As part of the study, participants were instructed to call the TLC once a week for several weeks. At the end of the study, participants rated the TLC on helpfulness and acceptability. Results revealed that the TLC received relatively high satisfaction, helpfulness, and usability ratings. Moreover, participants who interacted with the TLC reported experiencing emotions such as love, guilt, and ambivalence towards the computer (Kaplan et al, 2003). For example, one participant described the TLC system as an "unseen friend, a conscience."

In a 2000 review, Nass and Moon, described the literature on social responses to computers and concluded that humans automatically react to computers in social and relational ways. More specifically, humans (1) apply gender and ethnic stereotypes to computers (e.g. computers with male and female voices, or with accents), (2), worry about offending computers when evaluating their performance, (3) engage in reciprocal behaviors with computers (such as disclosing personal information after a computer discloses personal information first), (4) assign 'personalities' to computers (e.g. dominant versus submissive) and (5) report 'liking' computers whose personalities match their own. In sum, given the evidence that people often attribute human-like characteristics to computers, it is possible that common factors will play a role in CDBIs.

Personality/ Treatment Interactions

Characteristics of the client may also influence treatment success. To date, only a handful of studies have examined whether clients with different personality characteristics respond better to different types of therapy. The most notable of these studies is Project MATCH, a large-scale, multi-site clinical trial designed to match individual client characteristics to specific types of substance use treatment (i.e. Motivational Enhancement Therapy (MET), Cognitive-Behavioral Therapy (CBT), or Twelve-Step Facilitation Therapy (TSF)). Unexpectedly, results of Project MATCH revealed very few client/treatment interactions. There were some exceptions to this, however. In particular, clients who scored high on measures of trait anger had better outcomes from MET compared to CBT and TSF. Conversely, individuals who were a part of a social group that frequently drank benefited more from TSF than MET. TSF also led to higher levels of success among individuals with low levels of psychiatric disturbance, among highly-dependent alcohol users (Project MATCH Research Group, 1998; Mattson et al, 1998), and among individuals with the *GABRA2* allele associated with a low risk of alcohol use (Bauer et al, 2007).

In addition to Project MATCH, a few other studies have suggested that individuals with certain personality traits respond better to certain types of treatment. For example, Conrod and colleagues (2000) found that participants who received a brief intervention matched to their personality profile had less frequent and less severe drinking and drug use at six month follow-up than participants who watched a motivational film and had a “supportive conversation” with a therapist. Additionally, two studies aimed at reducing alcohol and drug use among adolescents assessed

participants on neuroticism, anxiety sensitivity, impulsivity, and sensation seeking (Conrod et al, 2010; Conrod et al, 2008). Approximately half the sample received a brief intervention tailored to their personality profile (e.g. individuals scoring high on sensation seeking received an intervention which targeted cognitions associated with reward sensitivity). Results showed that participants who received the targeted intervention used drugs less frequently (Conrod et al, 2010) and were less likely to binge drink at six and twelve month follow-ups (Conrod et al, 2008) than participants in a no intervention control group. A later study by the same research group found that personality-targeted interventions reduced cannabis use in adolescents who were high in sensation-seeking (Mahu et al, 2015). Notably, however, all of the studies mentioned above used either a no-intervention control group or an education/support-only control group. Therefore, results may simply suggest that any form of active intervention is superior to no intervention or an education-only condition. It should also be noted that at least one study testing a personality-targeted intervention has yielded null results (Lammers et al, 2015). Thus, more studies on personality-intervention interactions using active control groups (e.g. personality-targeted interventions that are not matched to a participant's personality) are needed

In addition to the studies reviewed above, a very small number of studies have examined whether client characteristics (e.g. anger, neuroticism, empathy) interact with therapist characteristics to affect therapy outcomes. For example, Karno and Longabaugh (2005) used data from Project MATCH to assess therapist directiveness, client reactance, and alcohol outcomes among 141 individuals receiving treatment for alcohol abuse or dependence. Findings revealed an interaction between therapist

directiveness and client reactance, such that higher levels of therapist directiveness led to worse alcohol use outcomes in patients with medium and high - versus low - levels of reactance. In 2009, Karno, Longabaugh and Herbeck replicated and extended these findings with a separate Project MATCH sample. Specifically, they examined 247 problem drinkers that were receiving either primary outpatient treatment or aftercare. Results revealed an interaction between therapist structure (a component of directiveness) and client reactance in the aftercare group. More specifically, increased therapist structure predicted fewer days of alcohol abstinence and more heavy drinking days for clients who were high, but not low, in reactance. Other studies have suggested that therapists who focus on affect are highly effective at reducing drinking among individuals experiencing a great deal of distress, but are highly ineffective at reducing drinking among individuals who are experiencing low levels of distress (Karno et al, 2002). Similarly, studies have shown that individuals with clinical depression drink less when assigned to a therapist who focuses on painful emotional material (Karno & Longabaugh, 2003). Additionally, some studies suggest that client-therapist personality congruence predicts lower symptomology (Coleman, 2006) and better therapeutic bond (Taber et al, 2011).

The literature reviewed above suggests that therapist characteristics affect some clients differently than others (e.g. high empathy clients may respond better to high empathy therapists, high reactance clients may respond better to low directive therapists, highly distressed clients may respond better to affect-focused therapists). CDBIs are ideal for examining this issue as they allow researchers to systematically manipulate specific common factors (e.g. to create CDBIs that are high and low in

empathy) while keeping all other aspects of the program constant. Additionally, CDBIs allow researchers to randomly assign clients to different versions of a program allowing researchers to better understand cause and effect (e.g. do motivated clients elicit more therapist empathy, or does therapist empathy produce more motivation?).

The Current Study

The current study examined the degree to which client characteristics interacted with narrator empathy in a CDBI. More specifically, the goals of the current study were twofold: (1) to determine whether an empathic (versus a non-empathic) narrator increased the efficacy of a CDBI and (2) to determine whether client characteristics interacted with narrator empathy level to affect outcomes. Participants were undergraduates who drank heavily. It was hypothesized that: (1) the high empathy narrator would produce greater motivation and intentions to reduce alcohol use than the low empathy narrator and (2) participant characteristics would interact with narrator empathy such that high empathy narrators would have a greater positive effect on certain types of participants. Because the literature in this area is sparse, this second aim was treated as exploratory and no firm hypotheses regarding the direction of personality by condition interactions were put forth.

Chapter 2: Method

Participants

Sixty-seven undergraduates (63% female, 63% Caucasian) who were enrolled in classes at Wayne State University participated in this study. Participants were recruited

through the psychology department subject pool (SONA) and flyers posted in campus buildings. Students interested in participating answered eligibility questions assessing current alcohol use. To meet eligibility requirements, participants needed to endorse one of the following four criteria: (1) 'sometimes' or 'frequently' consuming at least 3 (women)/4 (men) drinks per day, (2) 'sometimes' or 'frequently' consuming at least 7 (women)/14 (men) drinks per week, (3) getting drunk at least once per week over the past 6 months or (4) binge drinking at least once per week over the past 6 months (binge drinking = consuming 4 (women)/5(men) drinks in a 2-hour period).

Measures

Demographic information. Participants were asked to report their age, gender, and race/ethnicity.

Reactance. The Therapeutic Reactance Scale (TRS; Dowd, Milne, & Wise, 1991) is a 28-item, self-report measure which assesses reactance, or the propensity of an individual to speak and/or act out when the person believes that somebody is infringing on his or her freedom. Participants rate items such as "If I am told what to do, I often do the opposite," and "I find that I often have to question authority" on a 4-point scale (1 = Strongly disagree to 4 = Strongly agree). This measure has demonstrated adequate internal consistency and good convergent and discriminant validity in previous studies (e.g., Dowd et al, 1991), and in the present sample (α = .80).

Psychopathy. The Psychopathic Personality Inventory-Revised (PPI-R; Lilienfeld & Widows, 2005) is considered to be the gold standard (Witt, Donnellan, & Blonigen, 2009) for measuring psychopathic personality traits in non-forensic (i.e., community and

college) samples. The PPI-R is a self-report measure containing 154 items that are rated on a 4-point scale (1 = False, 2 = Mostly false, 3 = Mostly true, 4 = True). The scale content covers both the affective and behavioral domains of psychopathy and yields a total score along with two moderately correlated factor scores (Fearless Dominance [analogous to primary psychopathy] and Self-Centered Impulsivity [analogous to secondary psychopathy]). The measure also yields a score for Coldheartedness, a third factor which is orthogonal to primary and secondary psychopathy, and measures the callousness often seen in psychopathy. The PPI-R has been shown to be reliable, construct valid, and strongly associated with other measures that assess psychopathy (Lilienfeld, & Widows, 2005; Marcus, Fulton, & Edens, 2012; Ray, Weir, Poythress, & Rickelm, 2011), and it showed good internal consistency in the present sample (Total PPI α = .92, Fearless Dominance α = .91, Self-Centered Impulsivity α = .91, Coldheartedness α = .78).

Empathy. The Interpersonal Reactivity Index (IRI; Davis, 1980) is a commonly used measure of empathy which contains four subscales; Perspective-Taking, Empathetic Concern, Personal Distress, and Fantasy. Perspective-Taking refers to the ability to imagine a situation from another's point of view (e.g. "I try to look at everybody's side of a disagreement before I make a decision."). Empathetic Concern refers to the extent to which an individual feels compassion towards others (e.g. "I often have tender, concerned feelings for people less fortunate than me."). Personal Distress measures the extent to which an individual can regulate his or her emotions during high-stress situations (e.g. "In emergency situations, I feel apprehensive and ill-at-ease."). Fantasy refers to tendencies to relate to and take the perspective of fictional characters

(e.g. “When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.”), (Davis, 1980; Davis, 1983). Participants rated items on a 5-point scale ranging from 1=“Does not describe me well” to 5=“Describes me very well.” The IRI is one of the most commonly used measures of empathy (Gerdes et al, 2010) and most IRI subscales demonstrated acceptable internal consistency in the present sample (Fantasy α = .76, Perspective Taking α = .65, Empathetic Concern α = .75, Personal Distress α = .79).

Big Five Personality Traits. The Big Five Personality Inventory (BFI; John et al, 2008) is a 44-item self-report questionnaire which assesses the Big Five personality traits (Conscientiousness, Agreeableness, Extraversion, Neuroticism, and Openness to Experience). Conscientiousness refers to a propensity towards being organized, dependable, and high-achieving (“I see myself as someone who does a thorough job”); Agreeableness refers to tendencies to be trusting, tolerant, and warm towards others (“I see myself as someone who is generally trusting”); Extraversion refers to tendencies to be outgoing and engage in social behaviors (“I see myself as someone who is talkative”); Neuroticism refers to chronic feelings of anxiety and emotional instability (“I see myself as someone who gets nervous easily”); and Openness to Experience refers to tendencies to be intellectually curious, creative, and receptive to alternative points of view (“I see myself as someone who is original, comes up with new ideas”), (John et al, 2008). Participants rated statements on a 5-point likert scale (1= Disagree strongly to 5= Agree strongly). This measure has high reliability, and convergent and discriminant validity, as well as a strong factor structure (Soto & John, 2009) and it demonstrated good internal consistency in the present sample (Openness α = .77, Conscientiousness

α = .71, Extraversion α = .89, Agreeableness α = .73, Neuroticism α = .81).

Motivation to Reduce Alcohol Use. The Readiness to Change scale (RCS; Rollnick et al, 1992) is a 12-question measure that assesses motivation to reduce alcohol use. Respondents rate statements that reflect three stages of change, precontemplation, contemplation, and action (Prochaska, DiClemente & Norcross, 1992). In the current study, the four questions which reflect the action stage of change were dropped from the measure, as they are geared towards individuals who have already begun to reduce their drinking. Participants therefore completed a total of 8 questions; four that reflected precontemplation (e.g. "There is nothing seriously wrong with my drinking," "It's a waste of time thinking about my drinking because I do not have a problem") and four that reflected contemplation (e.g. "Sometimes I think I should quit or cut down on my drinking," "My drinking is a problem sometimes"). Response options ranged from 0 = Strongly disagree to 5 = Strongly agree. The RCS demonstrated good internal consistency in both the pre-test (α = .82) and the post-test (α = .86) of the present study.

Intentions to Reduce Drinking. Participants were asked to respond to 4 questions assessing intentions to reduce drinking. The first question asked participants to choose one of the following responses: "I have no interest in reducing my alcohol use right now;" "I may reduce my alcohol use at some point, but I'm not sure when;" "I'm planning on reducing my alcohol use sometime in the next year;" "I'm planning on reducing my alcohol use sometime in the next month;" "I'm planning on reducing my alcohol use sometime in the next week;" "I'm planning on reducing my alcohol use tomorrow;" "I'm planning on reducing my alcohol use today." The next three questions

asked participants to rate how likely they were to reduce their drinking over the next week, month, and year on a scale from 0 = Not at all likely to 5 = Extremely likely. This measure was developed by the Wayne State College Alcohol lab, and demonstrated good reliability in the pre-test (α = .90) and the post-test (.89) of the present study.

Alcohol Use. Participants were asked the following questions regarding their alcohol use: 1) how many days during the past month have you had a drink containing alcohol 2) how many drinks have you had in the past week 3) how many binge drinking episodes (defined as 4 or more drinks for women and 5 or more drinks per men) have you had in the past month and 4) how often have you been drunk in the past six months.

Reactions to the CDBI. Participants were also asked to respond to 12 questions, which assessed their reactions to the computer program (e.g. "How much did the computer seem to understand you?" "How much did you like working with the computer program?" "Did working with the computer make you feel supported?" etc.). Response options ranged from 1= Not at all to 5 = Very much. These questions were developed by the Wayne State College Alcohol lab to determine whether participants perceived/reacted to the high empathy condition differently than they did the low empathy condition.

Procedure

Participants were recruited through the SONA system and through flyers placed around campus. Individuals recruited through SONA completed a prescreen questionnaire that contained the current study's eligibility questions (as well as

questions relevant to other studies being run in the Psychology department). Students who met eligibility requirements on the prescreen questionnaire were given the option of signing up for a study timeslot through the SONA system. Students recruited through flyers answered the eligibility questions either over the phone or in an online screener (students' choice). Those who met the eligibility criteria and who were interested in the study were contacted by a research assistant and scheduled for a study timeslot.

A research assistant greeted participants in the laboratory, and then explained the study procedures and obtained informed consent. Participants then completed self-report questionnaires assessing empathy (the IRI), reactance (the TRS), psychopathy (the PPI), big five traits (the BFI), readiness to change (RTC), and intentions to reduce drinking on a tablet computer.

Next, participants completed a 15-20 minute interactive CDBI based on principles of motivational interviewing (e.g. being non-directive and non-confrontational, stressing the autonomy of the participant, aiming to reduce ambivalence about behavior change, etc. Miller & Rollnick, 2002). The MI program used in the current study consisted of 3 components; (1) decisional balance, in which participants identified what they liked (e.g. relaxation) and didn't like (e.g. loss of control) about alcohol use, (2) normed feedback, in which participants were given information about how their drinking compared to that of others their age and gender, and (3) goal setting, in which participants were offered the option of setting a behavior change goal (e.g., reducing their drinking frequency to only one drink per week). This 3-component intervention has been used in multiple previous studies and has been shown to be effective in reducing alcohol use and increasing motivation to change (Ondersma et al, 2005; Schwartz et al, 2014).

Participants were randomly assigned to receive either a high empathy or a low empathy version of the intervention. Individuals assigned to the low-empathy condition were guided through the intervention by a three dimensional, animated narrator who obtained information about the participant's drinking, but did not use the participant's name or make empathic/reflective statements. Individuals placed in the high-empathy condition were guided through the intervention by a highly interactive narrator who used the participant's name and showed empathy through reflective statements and comments about participants' hard work and cooperation (e.g., "You've said that drinking makes you relax and helps you enjoy social events." Ondersma et al, 2005).

After completing the intervention, participants completed the Readiness to Change Questionnaire and the Intention to Change questionnaire again. All participants were then fully debriefed and given a list of local mental health and addiction resources. The entire session took approximately 1 hour and 15 minutes. Participants recruited through SONA received either 2 SONA credits or a $20 Amazon gift card for completing the study (their choice). Participants recruited through flyers received a $20 Amazon gift card.

Analytic Strategy

A series of t-tests were conducted to ensure that random assignment was successful. Participants in the high vs. low empathy group did not differ on age ($t(65) = 0.37$, $p = .71$), gender ($\chi^2(1, N = 67) = 0.23$, $p = .63$), past 30 day alcohol use ($t(65) = 0.65$, $p = .52$), pre-intervention readiness to change ($t(65) = 1.49$, $p = .14$), or pre-intervention intentions to reduce drinking ($t(65) = 1.05$, $p = .30$). As a result, these

variables were not controlled for in analyses. Participants in the two groups did differ on secondary psychopathy, such that individuals assigned to the empathy condition had higher scores on the Self-Centered Impulsivity subscale of the PPI than individuals assigned to the low empathy condition, $t(65) = 2.20$, $p < .05$. Consequently, all analyses control for Self-Centered Impulsivity.

To test the effects of empathy on drinking outcomes, a MANCOVA was run to examine whether individuals assigned to the high empathy condition reported greater increases in readiness to change or intentions to reduce drinking over the course of the study (i.e. post-test minus pre-test scores) than individuals assigned to the low empathy condition, while controlling for Self-Centered Impulsivity.

To test (1) the main effects of personality on drinking and (2) interactions between personality and intervention condition, a series of regression analyses were run. A single personality variable, the condition variable (high vs. low empathy), and the 2-way interaction between the personality and condition variables were entered simultaneously into each regression model. To reduce multicollinearity, interaction variables were mean centered prior to computing cross-product terms (Aiken & West, 1991). When interactions were significant, follow-up partial correlations (controlling for Self-Centered Impulsivity) between the personality value and the drinking outcome were run for the low empathy and high empathy condition separately.

Chapter 3: Results

Data Screening

Data were screened for normality and outliers. A square root transformation was

used to correct significant skew in both readiness to change difference scores and drinking intention difference scores (Tabachnick & Fidell, 2007). To examine outliers, measures were transformed into z-scores, and individuals falling above +3.29 or below -3.29 were labelled as outliers. One univariate outlier on the "empathetic concern" subscale of the Interpersonal Reactivity Index was removed. There were no multivariate outliers.

There were occasional missing data points where participants did not answer a question on one of the questionnaires. Because only a small proportion (<1%) of the data was missing, mean imputation was used to estimate these missing values so that a total score could be calculated for each measure. Pairwise plots were examined to ensure that the data met assumptions for linearity and homoscedasticity.

Descriptives and Bivariate Associations

Table 1 shows means and standard deviations of primary study variables. As can be seen in the table, participants consumed an average of 5 (SD = 2.23) drinks per week, had an average of 3 (SD = 2.33) binge drinking episodes per month, and got drunk on an average of four days (SD = 2.13) in the past six months. Average psychopathy scores (FD: (*M* = 116.42*, SD* = 19.40), SCI: (*M* = 150.78, *SD* = 22.08), C: (*M* = 31.60, *SD* = 6.30)) fell within the expected range for a college student sample (Lilienfeld & Widows, 2005).

Table 2 shows correlations between primary study variables. Most correlations were in the expected direction. Reactance was negatively related to Agreeableness and positively related to all psychopathy variables except for Fearless Dominance.

Openness was positively related to Fearless Dominance and overall psychopathy score. Conscientiousness was negatively related to Self-Centered Impulsivity. Extraversion was strongly (r = .70) related to Fearless Dominance and overall psychopathy score. Agreeableness was negatively related to Self-Centered Impulsivity, Coldheartedness, and overall psychopathy, but was positively related to Perspective Taking and Empathetic Concern. Neuroticism was negatively related to Fearless Dominance, and was positively related to Self-Centered Impulsivity and Personal Distress. Binge drinking was related to both Self-Centered Impulsivity and overall psychopathy score.

Main Effects of Condition

As shown in figure 1, participants assigned to the low empathy condition reported greater increases in readiness to change than participants in the high empathy condition; however, when controlling for Self-Centered Impulsivity, this difference was not significant, $F(2,63) = 2.90$, $p = .093$, $\eta^2 = .04$. There were no differences between groups in intentions to reduce drinking difference scores, $F(2,63) = 1.14$, $p > .05$, $\eta^2 = .02$.

Main Effects of Personality

High scores on the following personality measures were associated with less change in RTC over the course of the study; Reactance ($\beta = -.29$, $p < .05$), overall psychopathy (total PPI scores; $\beta = -.41$, $p < .01$), and Openness to Experience ($\beta = -.30$, $p < .05$). No other personality variables were associated with difference scores in either readiness to change or intentions to reduce drinking.

Condition/Personality Trait Interactions: Readiness to Change

There was an interaction between Reactance and Condition (β = -.43, p = .001), such that Reactance was unrelated to readiness to change difference scores in the low empathy condition (r = .20, p = .28) but was negatively related to readiness to change difference scores in the high empathy condition (r = -.56, p = .001). More specifically, in the high empathy condition, higher reactance scores were related to less change in RTC over the course of the study. In the low empathy condition, reactance scores did not affect RTC difference scores (See Figure 2). Notably, this relationship appeared to be driven by two high (non-outlier) scores on the reactance measure. When these two scores were removed, the negative relationship between reactance and readiness to change in the high empathy condition was greatly reduced (r = -.31, p = .085).

There was also an interaction between Openness to Experience and Condition (β = -.32, p < .01), such that Openness was unrelated to readiness to change difference scores in the low empathy condition (r = -.003, p = .98), but was negatively related to readiness to change difference scores in the high empathy condition (r = -.52, p = .001). More specifically, in the high empathy condition, higher openness scores were related to less change in RTC over the course of the study. In the low empathy condition, openness did not affect RTC difference scores (See Figure 3).

Condition/Personality Trait Interactions: Intentions to Reduce Drinking

There was an interaction between Conscientiousness and Condition (β = -.33, p < .01), such that Conscientiousness was unrelated to with pre/post differences in

drinking intentions in the low empathy condition (r = .25, p = .17), but was negatively related to pre/post differences in drinking intentions in the high empathy condition (r = -.38, p < .05). More specifically, in the high empathy condition, higher conscientiousness scores were related to less change in drinking intentions over the course of the study. In the low empathy condition, conscientiousness did not affect drinking intention difference scores (See Figure 4).

There was also an interaction between Neuroticism and Condition (β = .31, p < .05), such that high Neuroticism was marginally associated with lower pre/post differences in intentions to reduce drinking in the low empathy condition (r = -.35, p = .057), but was unrelated to pre/post differences in intentions to reduce drinking in the high empathy condition (r = .22, p = .21). More specifically, in the low empathy condition, higher neuroticism scores were related to less change in drinking intentions over the course of the study. In the high empathy condition, neuroticism did not affect drinking intention difference scores (See Figure 5).

There was also an interaction between Personal Distress and Condition (β = .26, p < .05). While follow-up partial correlations were non-significant, the pattern of results suggested that Personal Distress was negatively related to pre/post differences in drinking intentions in the low empathy condition (r = -.28, p = .13) and positively related to pre/post differences in drinking intentions in the high empathy condition (r = .21, p =.24 : See Figure 6).

Finally, there was an interaction between Fearless Dominance and Condition (β = -.26, p < .05), such that Fearless Dominance was unrelated to pre/post differences in intentions to reduce drinking in the low empathy condition (r = .27, p = .14), and was

marginally related to lower changes in drinking intentions in the high empathy condition (r = -.34, p = .051; See Figure 7). More specifically, in the high empathy condition, higher fearless dominance scores were related to less change in drinking intentions over the course of the study. In the low empathy condition, fearless dominance did not affect drinking intention difference scores (See Figure 5)

Condition did not interact with any other personality variables to predict either readiness to change or intentions to reduce drinking.

Participant Satisfaction Questionnaire

Overall, participants in the high empathy and low empathy conditions did not report differences in satisfaction with the intervention. One notable difference is that participants in the high empathy condition reported feeling more supported (F(1,64) = 4.41, p < .05, η^2 = .06. Besides this question, participants in the high empathy condition did not report that the intervention was more understanding, respectful, or likeable (p's > .46) than participants in the low empathy condition.

Chapter 4 Discussion

Empathy and Readiness/Intention to Change

While empathy has been strongly associated with positive therapeutic outcomes in in-person interventions (Greenberg et al, 2001; Ritter et al, 2002; Pantalon et al, 2004; Firoentine & Hillhouse, 1999), it did not affect readiness or intention to change in the current CDBI. There are several potential explanations for this. First, empathy may simply not affect therapeutic outcomes in computer delivered interventions the way it

does in in-person interventions. Participants may find empathy coming from a computer character to be inauthentic or jarring, and they may be unable to build therapeutic alliances with computers in the same way that they do with human therapists. Thus, factors such as clarity and ease of use may be more important than empathy in the context of a CDBI.

Another possibility is that empathy *is* important in computerized interventions, but that the intervention used in this particular study did not make participants feel understood. This hypothesis is supported by the lack of differences between groups on the participant satisfaction questionnaire. It is possible that creating an empathic computerized intervention may be more nuanced than having a narrator make reflective statements. Expressing genuine empathy that clients can perceive may also require altering facial expression, tone of voice, and several other qualities. The use of other common factors along with empathy may also improve outcomes. Future studies might benefit from examining what other factors contribute to the perception that a character is empathic, and how this influences outcomes.

The use of a relatively low-risk college student sample may have also led to the observed results. Notably, pre-study readiness and intention to change scores were fairly low. For example, approximately 55% of participants strongly disagreed with the statement “Sometimes I wonder if my drinking is out of control.” These low pre-study readiness/intention to change scores may be due to the fact that (1) drinking levels in the current sample were lower than expected given the study screening criteria (e.g. mean binge drinking frequency was 3 times per month) and (2) alcohol use among college students is fairly normative (Johnston, O’Malley, Bachman, Schulenberg &

Miech, 2015). Students who feel that their drinking is normative and non-problematic are unlikely to experience increases in motivation/intention to change in either experimental condition (i.e. high or low empathy).

It should also be noted that college students often have substantial exposure to realistic-looking, computer characters (e.g., through video games) and may be very sensitive to subtle differences between animated characters and humans. More specifically, data suggest that approximately 80% of male and 58% of female students play video games (Anand, 2007). Notably, the intervention used in the present study has previously been tested in low-income, community samples (e.g., Ondersma et al, 2005; Schwartz et al, 2014). Thus, differing levels of computer/video game exposure across samples may have affected results.

A final possibility is that there was not enough power to detect differences in intentions to reduce drinking and readiness to change due to the relatively small sample size (N = 67). However, it is important to note that the readiness to change difference score was trending strongly in the non-predicted direction. Therefore, additional data may reveal that the low empathy condition increases readiness to change more than the high empathy condition.

Personality Trait Interactions

As expected, participants scoring high on reactance and psychopathy reported lower readiness to change difference scores over the course of the study. These results are consistent with previous studies which have found lower readiness to change and poorer working alliance among individuals with psychopathic traits (Taft et

al, 2004; Howells & Day, 2007), as well as results suggesting that individuals scoring high on reactance are less responsive to treatment (Seibel & Dowd, 1999; Beutler et al, 2003), less adherent (Madsen et al, 2009; Fogarty, 1997), and less likely to form positive therapeutic alliances (Kuhlman, 1997), particularly early on in treatment.

Importantly however, these main effects were qualified by two trait by condition interactions which revealed that both reactance and psychopathy were only (negatively) related to readiness to change in the high empathy condition. There was no relationship between these personality traits and difference scores in the low empathy condition. It is possible that individuals scoring high on psychopathy and reactance were particularly prone to do poorly in the high empathy condition because they are not empathic themselves and therefore may show deficits in their ability to recognize, process and respond to empathy expressed by others.

Greater openness to experience was also related to lower readiness to change, but only in the high empathy condition. Interestingly, high scores on Openness have been associated with measures of both empathy (Butrus & Witenberg, 2013; De Corte et al, 2007) *and* psychopathy (Ross et al, 2008; Stanley et al, 2013) in previous studies and in the present study. Individuals scoring high on Fearless Dominance and Openness show a willingness to participate in situations which others might find frightening, as well as an interest in and tolerance of the unknown. Therefore, it is possible that individuals scoring high on Openness had lower readiness to change difference scores because they didn't find the intervention used in the study stimulating. This may have been particularly noticeable in the high empathy condition where empathic, human statements were juxtaposed with a computerized voice.

Broadly, the high empathy conditions appeared to produce the greatest increases in readiness and intentions to change among participants who were low in Conscientiousness, high in Neuroticism, and high in Personal Distress. High Neuroticism in conjunction with low Conscientiousness has been shown in previous studies to predict higher stress, lower coping skills (Vollrath & Torgersen, 2000; Grant & Langan-Fox, 2006), lower resilience (Campbell-Sills et al, 2006), greater health-related risk taking (Vollrath & Torgersen, 2002), and more health consequences, such as greater inflammatory cytokines (Sutin et al, 2010). Empathy may be important in connecting to a population experiencing such a high level of distress. Future studies should examine whether populations scoring low on Conscientiousness and high on Neuroticism and Personal Distress are more responsive to highly empathic therapists and interventions involving empathy.

Implications

Although CDBIs have the ability to reach a wide variety of people and are relatively easy to study reliably, very few studies have examined how to maximize their effectiveness and no studies have examined how to make them effective for individuals with particular personality traits. The results from the present study suggest that the inclusion of empathy could be used to maximize the effectiveness of CDBIs among individuals scoring high on neuroticism and low on conscientiousness. Additionally, individuals who are not empathic (such as individuals scoring high on fearless dominance and reactance) may not benefit from empathy in CDBI's. Although the present study did not find benefits associated with adding reflective statements across

the entire sample, future studies might benefit from examining additional common factors. Future studies should also continue to explore the role that personality plays in treatment.

Limitations

The results of this study must be considered in the context of several limitations. First, as mentioned above, a college student sample was used. Although heavy drinking is common in college settings (White & Hingson, 2014; Knight et al, 2002), it is often perceived as normative and is socially reinforced (Borsari & Carey, 2001; Neighbors et al, 2007). Additionally, relationships between empathy and personality found in college samples may not generalize to clinical, community, or forensic samples. Therefore, future studies should examine how personality traits interact with narrator empathy in clinical or community samples which include individuals who drink at higher rates.

Additionally, conducting several planned comparisons may have increased the Type I error rate. As a result, it is important to acknowledge the possibility that the interactions between personality and condition were spurious.

Finally, some of the subscales posed a limitation. Specifically, the Drinking Intentions measure consisted of two sets of questions which used different rating scales, making interpretation difficult. Additionally, the internal consistency of the Perspective Taking subscale of the Interpersonal Reactivity Index was somewhat lower than expected (.65), limiting the conclusions that can be made.

Despite these limitations, this study suggests that personality influences

treatment outcome, as well as responsiveness to particular treatment characteristics. Future studies should continue to examine how personality influences treatment. Additionally, the study highlights some of the challenges with creating brief, computerized interventions that are human-like, empathic, and motivating. Understanding and addressing these challenges can greatly improve the ability of brief, computerized interventions to initiate change.

Table 1. *Means and standard deviations of primary study variables.*

Measure	**Mean (SD)**
Number of drinks per week	5.00 (2.23)
Binge drinking episodes (5+ drinks) in the past month	3.37 (2.33)
Number of times drunk in the past month	4.60 (2.13)
Pre-intervention Readiness to Change score	12.91 (8.15)
Post-intervention Readiness to Change score	15.62 (9.16)
Pre-intervention Intentions to Reduce Drinking score	6.06 (6.08)
Post-intervention Intentions to Reduce Drinking score	6.99 (6.35)
Reactance	70.15 (8.14)
Openness	3.64(0.61)
Conscientiousness	3.59 (0.50)
Extraversion	3.51 (0.84)
Agreeableness	3.76 (0.54)
Neuroticism	3.04 (0.70)
PPI – Fearless Dominance	116.42 (19.40)
PPI – Self-Centered Impulsivity	150.78 (22.08)
PPI – Coldheartedness	31.60 (6.30)
Total PPI Score	298.79 (33.95)
IRI – Empathetic Concern	20.60 (4.09)
IRI – Fantasy	17.73 (4.97)
IRI – Perspective Taking	18.70 (3.77)
IRI – Personal Distress	11.79 (5.13)

Table 2. *Correlations between personality measures*

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. TRS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. BFI-O	.43**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. BFI-C	-.18	.10	-	-	-	-	-	-	-	-	-	-	-	-	-
4. BFI-E	.20	.31*	.14	-	-	-	-	-	-	-	-	-	-	-	-
5. BFI-A	-.49**	-.05	.23	.04	-	-	-	-	-	-	-	-	-	-	-
6. BFI-N	.19	-.24	-.26*	.41**	-.23	-	-	-	-	-	-	-	-	-	-
7. PPI – FD	.24	.42**	.14*	.70**	-.13	-.44**	-	-	-	-	-	-	-	-	-
8. PPI – SCI	.59**	.23	-.56**	.05	-.42**	.33**	.16	-	-	-	-	-	-	-	-
9. PPI – C	.37**	.00	-.09	.04	-.38**	-.10	.12	.31*	-	-	-	-	-	-	-
10. Total PPI	.59**	.40**	-.30	.44**	-.42**	-.06	.70**	.80**	.45	-	-	-	-	-	-
11. IRI - EC	-.27*	.01	-.00	-.10	.34**	.18	-.17	-.26*	-.68**	-.39**	-	-	-	-	-
12. IRI - F	.07	.20	-.19	.09	.10	.18	-.01	.19	-.44**	.04	.38**	-	-	-	-
13. IRI - PT	-.17	.32**	.08	.18	.35**	-.22	.20	-.11	-.19	.01	.20	.16	-	-	-
14. IRI - PD	-.08	-.22	-.20	-.30*	.05	.57**	-.52**	.16	-.16	-.22	.26*	.13	-.12	-	-
15. Drink Freq.	-.03	-.09	.16	-.02	.03	-.01	-.08	-.13	-.01	-.13	.09	.18	.13	-.11	-
16. Binge Drink	.20	.15	.03	.17	-.20	-.07	.16	.28*	.14	.30*	.05	.12	.09	-.01	.33*

LSRP: 1. Therapeutic Reactance Scale 2. Big Five Inventory – Openness 3. Big Five Inventory – Conscientiousness 4. Big Five Inventory – Extraversion 5. Big Five Inventory – Agreeableness 6. Big Five Inventory – Neuroticism 7.PPI – FD: Psychopathic Personality Inventory – Fearless Dominance, 8. PPI – SCI: Psychopathic Personality Inventory – Self-Centered Impulsivity, 9. PPI – C: Psychopathic Personality Inventory – Coldheartedness 10. Total PPI: Psychopathic Personality Inventory – Total Score, 11. IRI – EC, Interpersonal Reactivity Index – Empathetic Concern, 12. IRI – F, Interpersonal Reactivity Index – Fantasy, 13. IRI – PT, Interpersonal Reactivity Index – Perspective Taking, 14. IRI – PD, Interpersonal Reactivity Index – Personal Distress 15. Drink Freq.: Number of drinks in past month 16. Binge Drink: Binge drinking episodes in past month

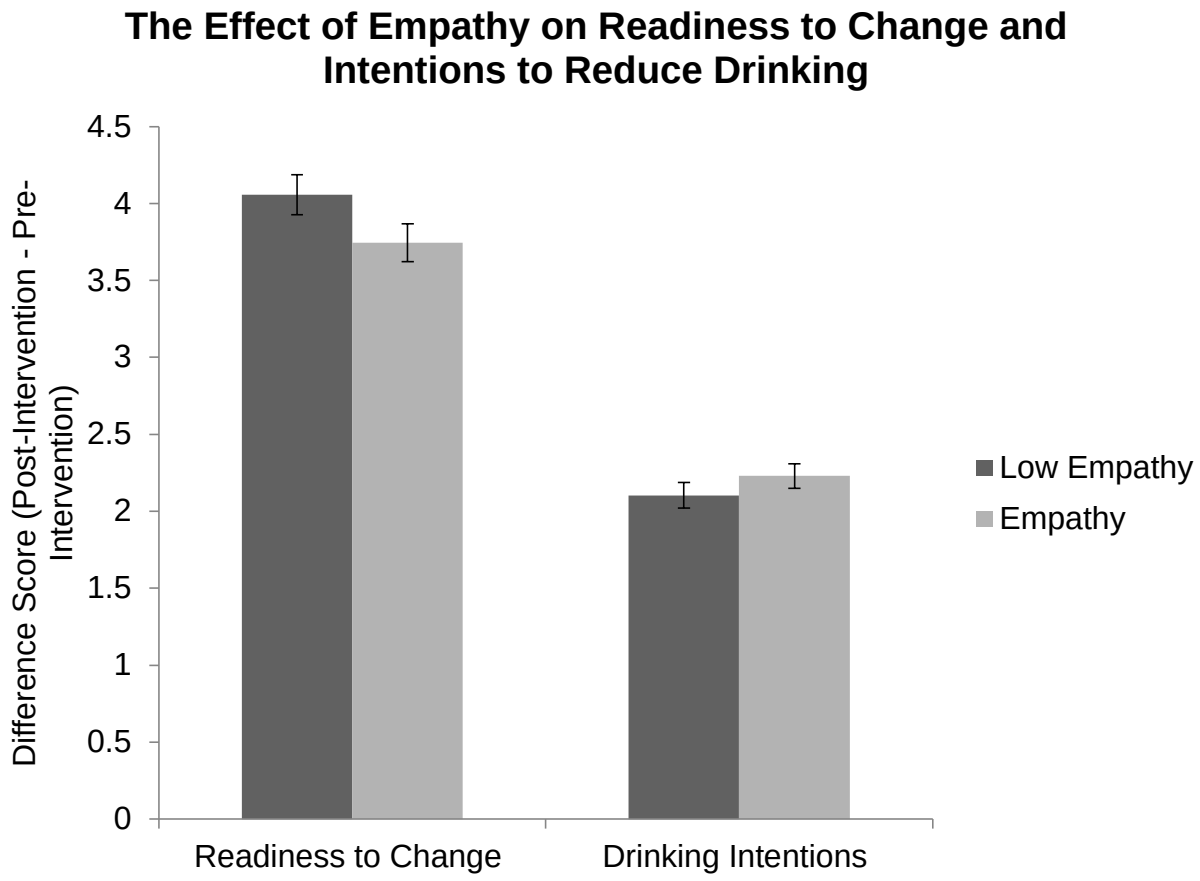

Figure 1: Condition did not influence drinking intentions or readiness to change when controlling for Self-Centered Impulsivity.

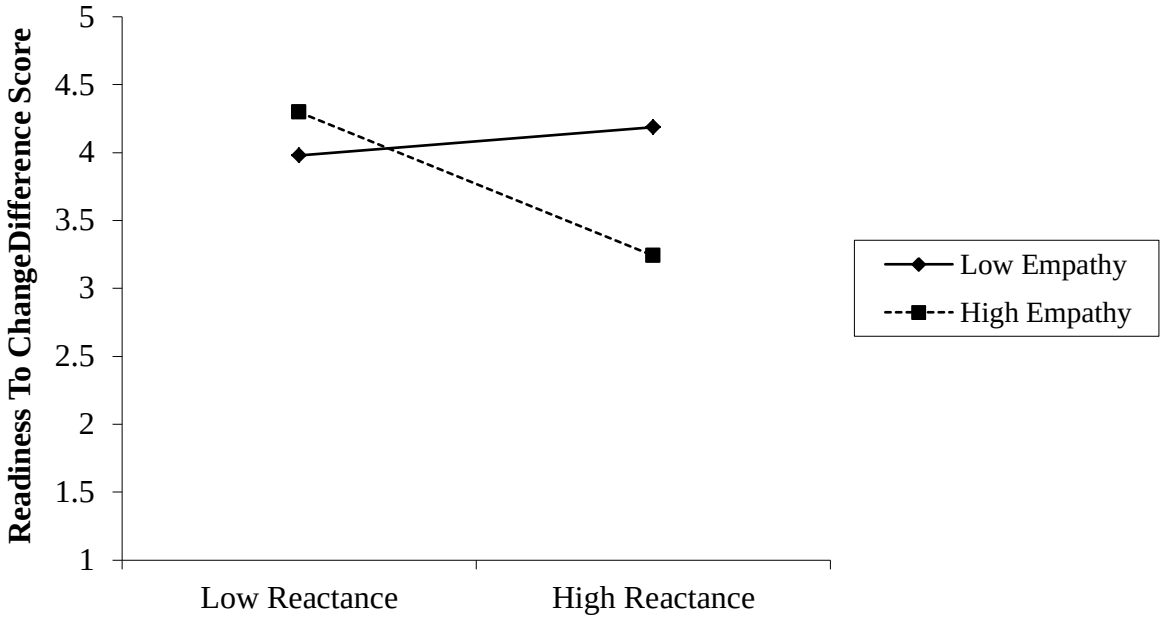

Figure 2. Participants scoring high on Reactance reported lower readiness change difference scores in the high empathy condition.

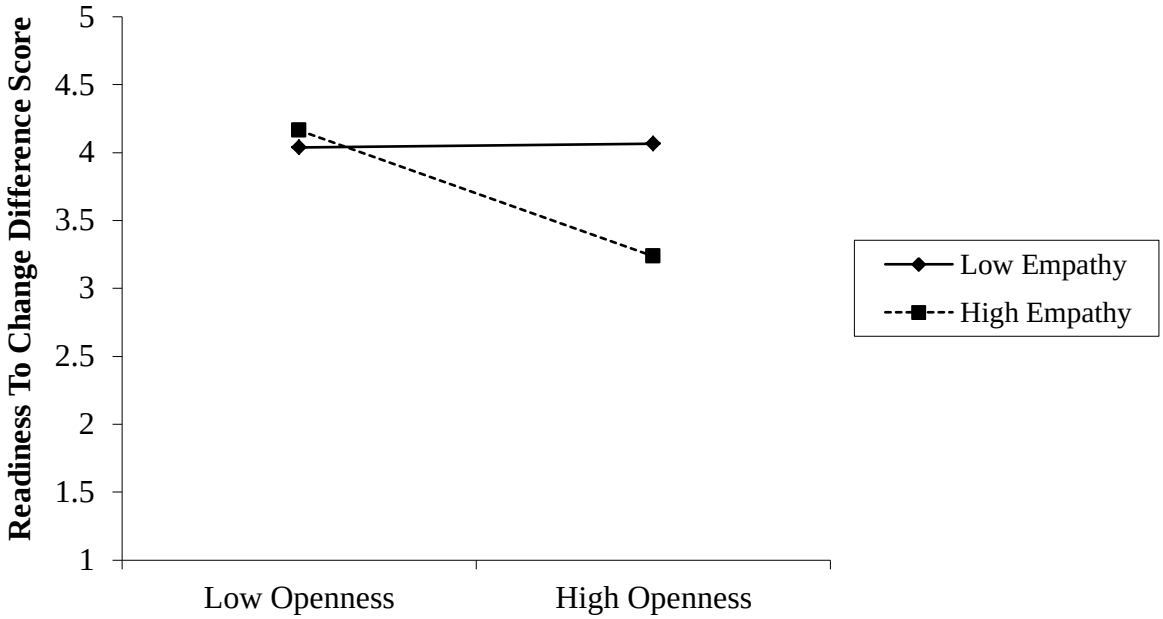

Figure 3. Participants scoring high on Openness reported lower readiness change difference scores in the high empathy condition.

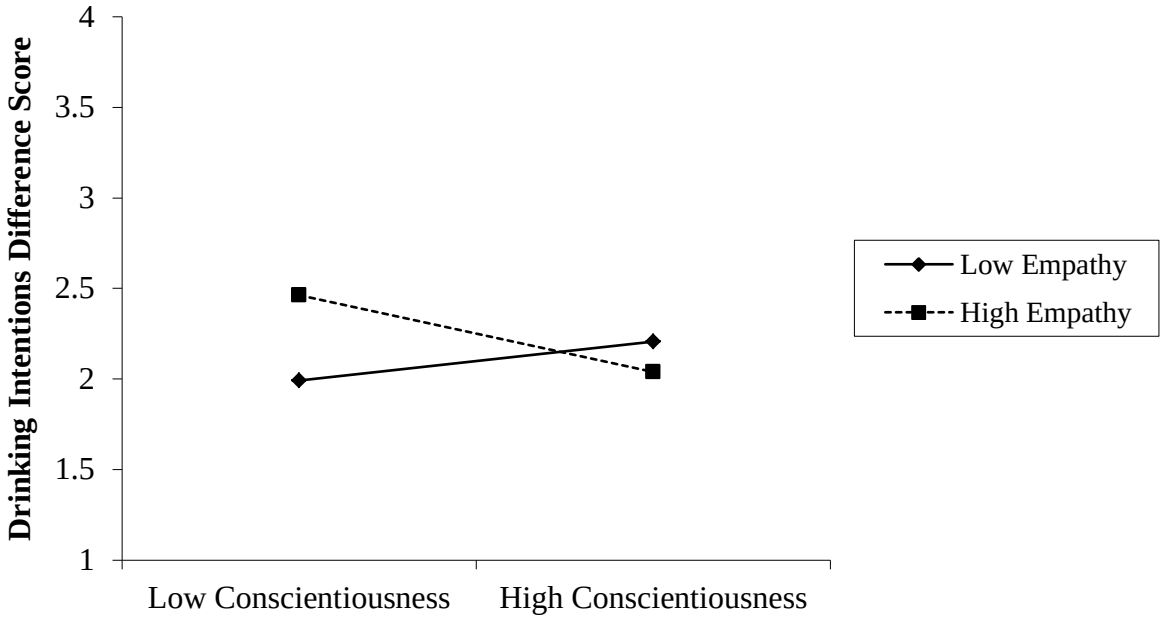

Figure 4: Participants scoring low on Conscientiousness reported greater intentions to reduce drinking difference scores in the high empathy condition.

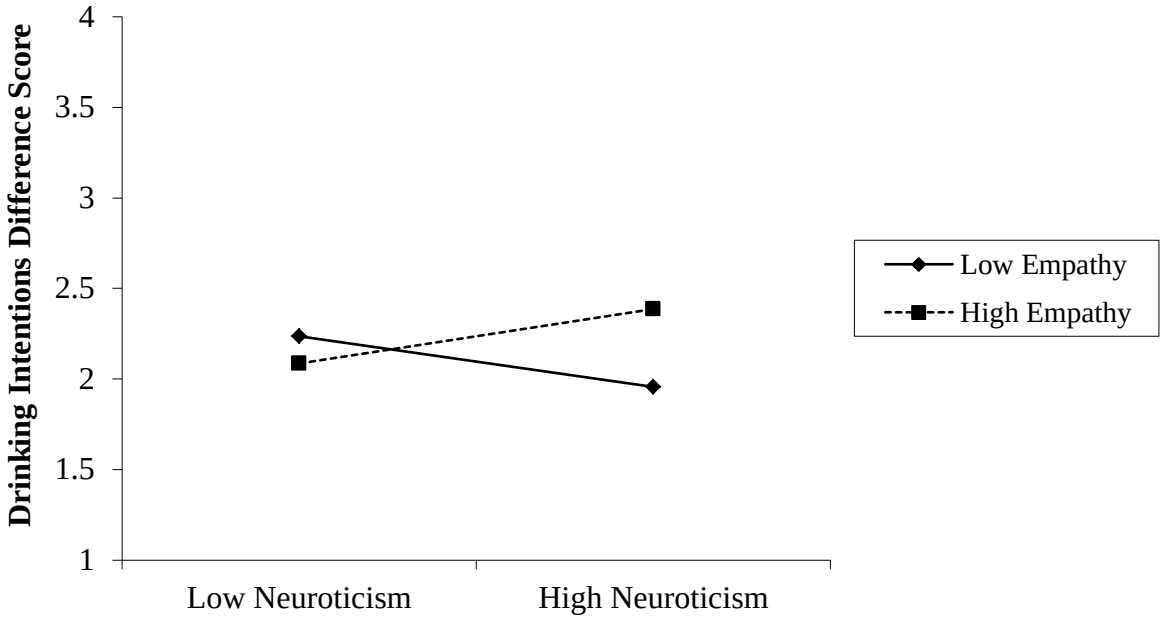

Figure 5. Participants scoring high on Neuroticism reported greater intentions to reduce drinking difference scores in the high empathy condition.

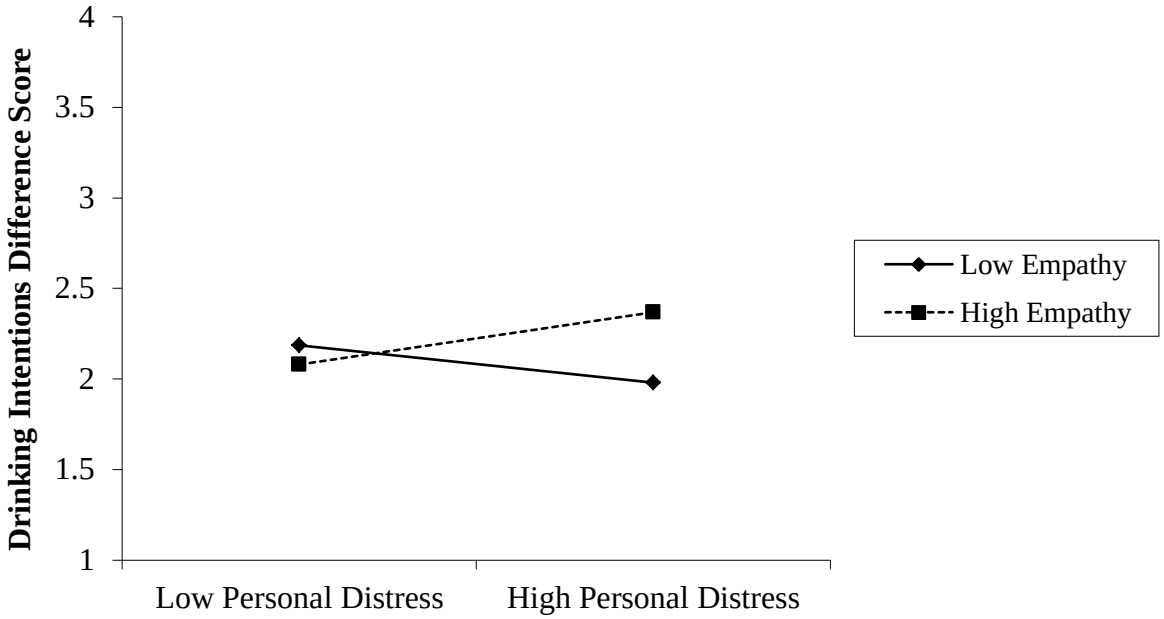

Figure 6. Participants scoring high on Personal Distress reported greater intentions to reduce drinking difference scores in the high empathy condition.

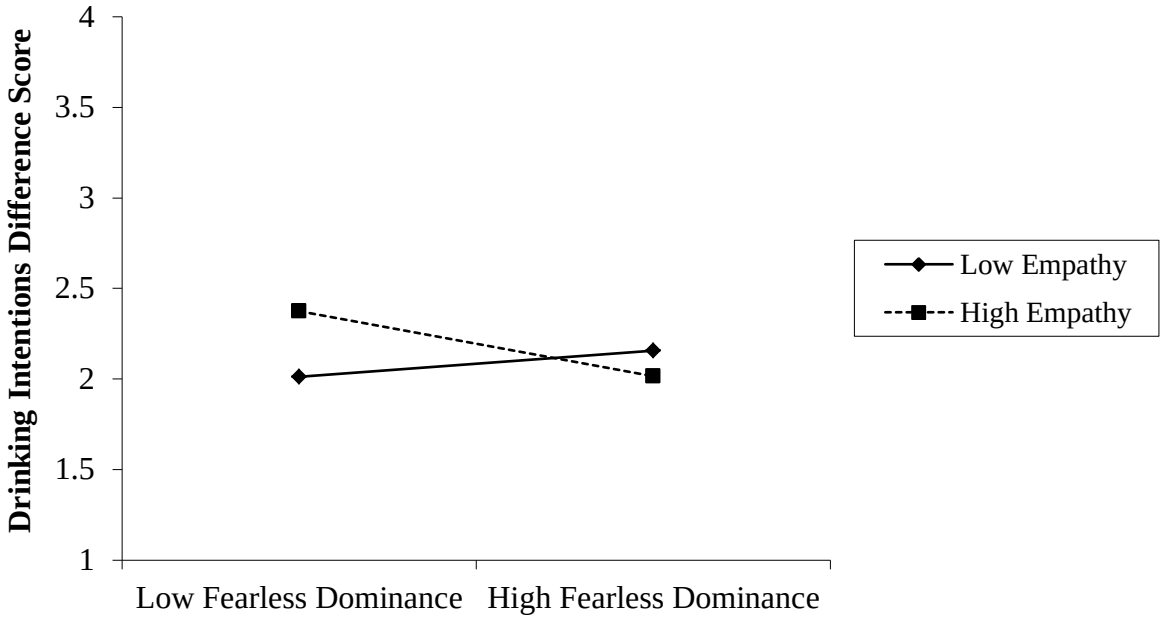

Figure 7. Participants scoring low on Fearless Dominance reported greater intentions to reduce drinking difference scores in the high empathy condition.

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ABSTRACT

PERSONALITY TRAIT INTERACTIONS WITH NARRATOR EMPATHY

IN A BRIEF COMPUTERIZED INTERVENTION

by

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Computer-delivered, brief interventions (CDBIs) have been an increasingly popular way to treat substance use disorders; however, very few studies have examined which characteristics of CDBIs maximize intervention effectiveness. The literature has consistently demonstrated that therapist empathy is associated with reduced substance use; however, it is unclear whether this principal applies to CDBIs. Therefore, one aim of this study was to examine whether the presence of an empathic narrator increases motivation to reduce heavy drinking in a CDBI. A second aim was to examine whether an individual's personality traits (empathy, psychopathy, and Big Five Traits) interact with treatment characteristics (specifically high vs. low empathy). Results suggested that empathy did not influence motivation to reduce drinking across the entire sample, but that certain personality characteristics interacted with narrator empathy. Specifically, individuals with low conscientiousness and high neuroticism had greater readiness to change with the high empathy narrator, whereas individuals with high reactance, openness, and fearless dominance reported greater readiness to change with the low empathy narrator.