Effects of narrator empathy in a computer delivered brief intervention for alcohol use

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A R T I C L E   I N F O

Keywords:
Alcohol use
Computerized interventions
Brief interventions
Empathy
Personality

A B S T R A C T

Computer-delivered, brief interventions (CDBIs) have been an increasingly popular way to treat alcohol 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 in in-person therapy; however, it is unclear whether this principle applies to CDBIs. Therefore, the study aimed to examine whether the presence of an empathic narrator increased intentions to reduce heavy drinking in a CDBI. Results suggest that the presence of empathy increases motivation to reduce drinking, and makes participants feel more supported and less criticized.

1. Introduction

In 2015, 25% of United States residents, age 12 and older, reported past month binge drinking [15], and 8.5% of U.S. adults have an alcohol use disorder [2]. However, the majority of these individuals do not receive treatment [15]. Barriers to receiving treatment include cost, transportation problems, lack of time, lack of trained providers, and the belief that treatment is not needed [15].

Computer-delivered, brief interventions (CDBIs) may help address these barriers. CDBIs are inexpensive, portable, and can be administered without a therapist. More importantly, they may be low-burden including those who would refuse more intensive treatments—will agree to complete them.

CDBIs vary in terms of many characteristics [20]. One characteristic of CDBIs which may be associated with better treatment outcomes is empathy. While empathy has repeatedly been associated with positive outcomes with in-person substance use treatment (e.g., [13,25]), it is unclear whether making a computer program more empathic (e.g., by adding non-judgmental, reflective statements) will enhance its efficacy, or whether clients can form a ‘relationship’ with a computerized narrator in the same way they do with a therapist.

Findings from the human-computer interaction literature suggest that humans frequently respond to computers in very social ways [9,10,14]. 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 (e.g. disclosing personal information after a computer discloses personal information first) and (4) assign ‘personalities’ to computers [14].

Additionally, a number of existing CDBIs—particularly those that use motivational interviewing (MI)– have incorporated empathy and other MI-consistent interpersonal characteristics (e.g. alliance, optimism) into their interventions (See [22] for a review). For example, Henkemans et al. [8] incorporated a “persuasive computer assistant” who was empathic, complimentary, and optimistic into a healthy lifestyle intervention. Similarly, Gerbert et al. [4] developed two computerized substance use interventions that were delivered by an empathic, nonjudgmental, respectful, collaborative “video doctor.” To date, however, no studies have systematically manipulated the presence vs. absence of empathy in a CDBI for substance use (e.g. by testing a computerized narrator with varying levels of empathy). Thus, it is difficult to gauge the specific effects of empathy (or other relationship factors) on the efficacy of computerized interventions.

1.1. The current study

The current study attempted to determine whether an empathic narrator increased the efficacy of a CDBI. It was hypothesized that participants in the high empathy condition would view the narrator as more empathic than participants in the low empathy condition. Additionally, it was expected that the high empathy condition would produce greater intentions to reduce drinking than the low empathy condition.
condition.

2. Method

2.1. Participants

One-hundred and three undergraduates (57% Caucasian, 50.5% female) at a large, Midwestern university participated in this study. An a priori power analysis indicated that the sample size would provide sufficient power (80%) to detect moderate effects (d up to 0.5). 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).

2.2. Measures

2.2.1. Demographic information

Participants reported their age, gender, and race/ethnicity.

2.2.2. 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,” and “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. These responses were summed to create a total Drinking Intentions score. This measure fits within the larger theory of planned behavior [1], and was designed to be similar to measures of intentions to reduce drinking used in previous studies (e.g., [5,7]). The measure demonstrated good reliability in the pre-test (α = 0.90) and the post-test (α = 0.89) of the present study. Post-intervention increases in intention to change are related with subsequent behavior change [24].

2.2.3. Participant ratings of narrator empathy

To verify that participants in the high empathy condition perceived the intervention as more empathic than participants in the low empathy condition, participants were asked the following three questions: “How well did the computer seem to understand you?”, “Did working with the computer make you feel supported?” and “Did working with the computer make you feel criticized?”. Participants rated the items on a scale ranging from 1 (Not at all) to 5 (Very much). Due to the low inter-item consistency of the scale (α = 0.14), the three items were analyzed separately.

2.3. Procedure

Participants were recruited through the university’s research participation pool and through flyers placed on campus. Individuals recruited through the research participation pool completed a prescreen questionnaire that contained the current study’s eligibility questions. Students who met eligibility requirements on the prescreen questionnaire were given the option of signing up for a study timeslot online. 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, explained the study procedures, and obtained written informed consent (approved by the university Institutional Review Board). Participants then completed a demographic measure and a measure assessing intentions to reduce drinking on a tablet computer.

Next, participants completed a 15–20 min 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; [12]). 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). The intervention is tailored based on participants’ individual responses about drinking (e.g. if participants indicate they are not interested in reducing their drinking, the goal setting component is skipped). This 3-component intervention approach has been used in multiple previous studies and has been shown to be effective in reducing alcohol use and increasing motivation to change [17,18].

Research assistants used a randomization sheet created at www.randomization.com to assign participants to 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 highly interactive narrator who used the participant’s name and showed empathy through reflective statements (e.g., “You’ve said that drinking makes you relax and helps you enjoy social events.” [18]) and comments about participants’ hard work and cooperation. Both interventions were equivalent in length. Notably, the high empathy group (N = 71) was larger than the low empathy group (N = 32). Data from the high empathy group was also used for an unrelated study that required a larger number of participants, therefore creating unequal group sizes for this study.

After finishing the intervention, participants completed the Intentions to Reduce Drinking 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 h and 15 min. Participants received either research credit or an Amazon gift card for participating.

2.4. Analytic strategy

A series of chi-square and t-tests were conducted to ensure that random assignment was successful. Participants in the high vs. low empathy group did not differ on age (χ²(1, N = 103) = 1.78, p = 0.19), past 30 day alcohol use (t(101) = 0.72, p = 0.86), or pre-intervention intentions to reduce drinking (t(101) = 0.05, p = 0.80). As a result, these variables were not controlled for in analyses. The groups did differ on gender (χ²(1, N = 102) = 4.00, p = 0.045); however, gender was unrelated to intentions to reduce drinking (t(95) = 0.45, p = 0.65), so this variable was not considered further.

Data were screened for normality and outliers. Six participants had extreme scores (i.e., participants falling > 3.29 standard deviations above or below the mean; [23]) on the Drinking Intentions Questionnaire and were excluded from analyses. There were occasional missing data points where participants did not answer a question on
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