

Longing for the Non-Addicted Self:  
Self-Discontinuity Increases Readiness to Change via Nostalgia

by

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Abstract

**Objective:** Across three studies, self-discontinuity (i.e., a sense that the present self is different from the past self) was examined as a motivating factor for readiness to change. Moreover, nostalgia was assessed as the mediating variable in this relationship.

**Method:** Self-discontinuity was both measured (Study 1) and manipulated (Studies 2 and 3) among a sample of disordered gamblers (Studies 1 and 2) and problem drinkers (Study 3). In all three studies, nostalgia and readiness to change was assessed.

**Results:** As predicted, high levels of self-discontinuity resulted in greater readiness to change to the extent that disordered gamblers felt nostalgic for the pre-addicted self (Studies 1 and 2). Study 3 extended the generalizability of the results by replicating these findings with a sample of problem drinkers.

**Conclusion:** Highlighting the difference between people's past non addicted and present addicted selves may be an important catalyst in moving people from addiction to action.

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Table of Contents

<b>Introduction</b> .....	<b>8</b>
<b>Understanding Behavioral Change: Moving From Addiction to Action</b> .....	<b>9</b>
<b>The Potential Benefits of Self-Discontinuity</b> .....	<b>10</b>
<b>Nostalgia: A Possible Mediating Mechanism</b> .....	<b>11</b>
<b>Present Research</b> .....	<b>12</b>
<b>Study 1</b> .....	<b>13</b>
<b>Method</b> .....	<b>13</b>
<b>Results</b> .....	<b>16</b>
<b>Discussion</b> .....	<b>17</b>
<b>Study 2</b> .....	<b>17</b>
<b>Method</b> .....	<b>18</b>
<b>Results</b> .....	<b>19</b>
<b>Main analysis</b> .....	<b>20</b>
<b>Discussion</b> .....	<b>20</b>
<b>Study 3</b> .....	<b>21</b>
<b>Method</b> .....	<b>22</b>
<b>Results</b> .....	<b>23</b>
<b>Main analysis</b> .....	<b>23</b>
<b>Discussion</b> .....	<b>25</b>
<b>General Discussion</b> .....	<b>25</b>
<b>Implications and Caveats</b> .....	<b>28</b>
<b>Conclusion</b> .....	<b>30</b>
<b>References</b> .....	<b>32</b>
<b>STUDY 1 MATERIALS</b> .....	<b>43</b>
<b>STUDY 2 MATERIALS</b> .....	<b>60</b>
<b>STUDY 3 MATERIALS</b> .....	<b>78</b>

List of Tables

*Table 1.* Summary of binary logistic for readiness to change..... 33

List of Figures

*Figure 1.* Mediation model with self-discontinuity (IV), nostalgia (M), and the categorical measure of readiness to change among disordered gamblers (DV): Study 1. 34

*Figure 2.* Mediation model with self-discontinuity (IV), nostalgia (M), and continuous measure of readiness to change among disordered gamblers (DV): Study 2..... 35

*Figure 3.* Mediation model with self-discontinuity (IV), nostalgia (M), and continuous measure of readiness to change among problem drinkers (DV): Study 3 ..... 36

List of Appendices

STUDY 1.....	43
STUDY 2.....	60
STUDY 3.....	78

Longing for the Non-Addicted Self: Self-Discontinuity Increases Readiness to Change  
via Nostalgia

Readiness to change among people engaged in addictive behaviors is astonishingly low, especially considering the array of negative consequences associated with their behaviors (e.g., physical, psychological, and interpersonal problems; see Amato & Rogers, 1997; Hall & Solowiji, 1998; Lesieur & Custer, 1984). Indeed, according to Miller (2002), only 15% of people engaged in addictive behaviors take the necessary steps to remove those behaviors from their repertoire. In the current research, a novel approach is taken to increase rates of behavioral change by focusing the person who is engaging in addictive behaviors attention towards their self-concept. Specifically, the present research tests the idea that people who believe that their addictive behavior has changed a core aspect of the self for the worse will feel nostalgic for their old self, thereby motivating the desire to initiate behavioral change.

The idea of ‘change as a return’ presented herein is a departure from the traditional conceptualizations of behavioral change as growth toward a new and improved self (Hanninen, & Koski-Jannes, 1999; Joseph & Linley, 2006). Indeed, client-centered therapies focus on how people can leave their addiction behind in order to achieve personal growth. In a like manner, many fitness and weight loss programs try to attract costumers though the promise of a better future for the self. For example, Weight Watchers tries to motivate behavioral change by suggesting to costumers that their *new beginning starts here* (weightwatchers.ca). By contrast, among people who are engaging in addictive behaviors, readiness to change may become increasingly likely when they feel that their sense of self has undergone fundamental negative change (i.e., self-discontinuity) due to their addictive behaviors, leading to a longing for the past ‘non-

addicted' self (i.e., nostalgia). Herein, the relationships among self-discontinuity, nostalgia, and readiness to change are tested among both disordered gamblers and problem drinkers.

### **Understanding Behavioral Change: Moving From Addiction to Action**

Despite the lack of readiness to change among many people living with an addiction (Millar, 1998), some do muster the necessary intestinal fortitude to stop. Although it is easy for observers to mark only the point of cessation, for the person who is engaging in the addictive behavior, cessation is not an event but a process – a process that is comprehensively described by the transtheoretical model of behavioral change (TTM; DiClemente et al., 1991).

According to the TTM, there are five distinct stages involved in a person's readiness to act on a new and healthier behavior (DiClemente et al., 1991): pre-contemplation (not thinking about change), contemplation (thinking about change), preparation (preparing to change within the next 30 days), action (actively modifying unhealthy behavior) and maintenance of the behavioral change. The extant literature on the TTM suggests that the model provides good predictive utility regarding where a person is on route to change (Gomes & Pascual-Leone, 2009). Indeed, people who have progressed to more advanced stages of the TTM are more likely to initiate behavioral change than people at earlier stages (Carey, Purnine, Maisto, & Carey, 2002). For example, Ledgerwood and colleagues (2013) found that gamblers who reported greater readiness to change, thus being at more advanced stages of the TTM were more likely to take measures to alter their gambling behavior.

Unfortunately, there is a paucity of research delineating the factors that *motivate* people's movement from one TTM stage to another (see Wohl & Thompson, 2011).

However, Miller and Rollnick (2002) hint at one possible motivating factor – the distress experienced through awareness that one’s engagement in harmful behavior is incongruent with their self-concept. In line with this supposition, there is a considerable body of empirical literature that suggests a sense of self-discontinuity – the notion that the core self has undergone fundamental changes – is psychologically distressing (Dunkel, 2005; Lampinen, Odegard, & Leding, 2004) and should thus be avoided (Milligan, 2003). Indeed, a sense of self-discontinuity has been associated with psychologically maladaptive outcomes such as a weakened sense of the self, lower self-esteem, and an inability to cope with negative life event (Diehl, Jacobs, & Hastings, 2006; Sadeh & Karniol, 2012). However, research in this domain has focused exclusively on self-discontinuity following stressful transitional life events (e.g., unwanted separation from a spouse, death of a loved one; see Sani, 2008) – events in which self-change is unwelcome. Herein, self-discontinuity is assessed within a context in which self-change might produce benefits (e.g., addictive behaviors). Specifically, in the spirit of Miller and Rollnick (2002), self-discontinuity is assessed as a motivator for behavioral change among those living with an addiction.

### **The Potential Benefits of Self-Discontinuity**

Addictive behaviors have been associated with profound negative changes to people’s moods, behaviors and their notions of the self (Best, Manning, & Strang, 2007; Shinebourne & Smith, 2009). In turn, these negative changes can lead the person engaging in addictive behaviors to dislike the person they have become and view the past self as being more favorable than the present self (Nuske & Hing, 2012). Thus, highlighting the self-discontinuity between the past non-addicted self and present addicted self might catalyze a readiness to change.

Specifically, self-discontinuity between the past non-addicted and present addicted self might promote a longing to return to the non-addicted self. Indeed, Berg and Miller (1992) reported that when those who are engaging in addictive behaviors are asked to describe what a typical day would look like if the addiction was no longer present, they tend to describe a nostalgic past. A person engaging in problematic gambling in this context, might describe not having to worry about finances, not feeling guilty about lying to their spouse and being free of anxiety – a typical day before the addiction took hold. Moreover, for people whose gambling behaviors has become disordered, the desire to hit a jackpot has more to do with a desire to put things right and return to the life that was than the dream of a new, better life (Binde, 2013). Importantly, anecdotal evidence for the supposition that a sense of self-discontinuity may facilitate behavioral change comes from Nuske and Hing (2012). They reported that among people engaging in disordered gambling, an important motivator of behavioral change was awareness of the discontinuity between the past non-addicted and present addicted self. Extending the work of Miller and Rollnick (2002) and Nuske and Hing (2013), the current research directly tests the hypothesis that a sense of self-discontinuity will facilitate readiness to change for people engaging in addictive behavior. Importantly, nostalgia was assessed as the mechanism by which self-discontinuity motivates readiness to change.

### **Nostalgia: A Possible Mediating Mechanism**

Humans have a unique capacity to mentally time travel – people think about the possibilities the future might hold as well as think reflectively about the past (Wilson & Ross, 2001; Wohl, Squires, & Caouette, 2012). When the past is in focus and thoughts are filled with sentimental longing or wistful affection, a positive emotional response is typically elicited known as nostalgia (Davis, 1979). This positive emotional response to

the past has been shown to yield high levels of positive affect and self-regard (Vess, Arndt, Routledge, Sedikies & Wildschut, 2012) as well as a strong sense of social belonging (Wildschut, Sedikides, Routledge, Arndt, & Cordaro, 2010). Importantly for the current research, Davis (1979) argued that nostalgia increases alongside a sense of self-discontinuity.

In an experimental demonstration of Davis' (1979) supposition, Sedikides and colleagues (2008) found that participants who experienced more self-discontinuity reported higher levels of nostalgia. They argued that nostalgia is a positive coping mechanism in the face of self-discontinuity because it is a repository of positive affect. As such, feelings of nostalgia allow people to access positive perceptions about the past to bolster a sense of self-continuity and meaning. More recently, Iyer and Jetten (2011) showed that people who were experimentally manipulated to feel a sense of self-discontinuity reported increased interest in recapturing the past compared to people who were made to feel a sense of self-continuity. However, whereas Iyer and Jetten (2011) perceived the desire to recapture the past as a negative consequence, for those who are engaging in addictive behaviors, the interest in recapturing the past may be beneficial. Specifically, people who perceive a fundamental difference between their present addicted self and their past non-addicted self should be more likely to engage in nostalgic reflection, which in turn leads to increase in readiness to engage in behavioral change.

### **Present Research**

Across three studies, the association between self-discontinuity and readiness to change among people engaging in addictive behaviors was examined. Study 1 sought to establish an association between self-discontinuity and readiness to change in a sample of disordered gamblers. Additionally, nostalgia was tested as a possible mediating variable..

In Studies 2 and 3, self-discontinuity was experimentally manipulated in a sample of disordered gamblers and problem drinkers, respectively. Specifically, self-discontinuity was manipulated by having participants read a report stating that disordered gambling (Study 2) or problem drinking (Study 3) can fundamentally change (or does not change) a person's sense of self for the worse. It was hypothesized that participants exposed to the self-discontinuity manipulation (as opposed to the self-continuity manipulation) would report a greater readiness to change. As in Study 1, Studies 2 and 3 tested nostalgia as the possible mediating variable between self-discontinuity and readiness to change.

### Study 1

Most people gamble at recreational levels. However, for approximately 1 to 3% of the population, gambling can become disordered leading to an array of psychological, financial, and interpersonal hardships (Berg & Kuhlhorn, 1994; Productivity Commission, 2010). Yet, readiness to change among disordered gamblers is especially low (Bellringer, Pulford, Abbott, DeSouza, & Clarke, 2008; Evans & Delfabbro, 2005). Indeed, past research examining readiness to change among disordered gamblers suggest that only 7% of disordered gamblers will engage in behavioral change (see Bellringer et al., 2008). In Study 1, a meditational model was examined where self-discontinuity increased readiness to change via nostalgia.

### Method

**Participants.** Participants consisted of 276 community gamblers (159 males, 114 females, 3 unreported) recruited from Amazon.com's Mechanical Turk (MTurk). Participation was limited to those who were engaging in gambling activities (e.g., slot machines, poker, blackjack, roulette, sports betting) or have done so within the past 12

months. The participants ranged in age from 18 to 72 years ( $M = 35.62$ ,  $SD = 13.38$ , 11 unreported) and were compensated US \$0.50 for their participation.

**Procedure and measured variables.** Upon agreeing to participate in the study, participants were provided a link to an on-line survey. After providing informed consent, participants completed a series of questionnaires measuring the variables of interest. Upon completion of the questionnaire, participants were redirected to a debriefing page.

Participants first completed the Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001). The PGSI is a nine-item measure, which categorizes four types of gamblers based on the participant's total score. The PGSI contains items that assess problem gambling behavior, "*Have you bet more than you could really afford to lose?*" and items assessing the consequences of gambling, "*Has gambling caused you any health problems, including stress or anxiety?*" and is anchored from 0 (*Never*) to 3 (*Almost Always*). A participant with a score of 0 is categorized as being a non-problem gambler, 1-2 is categorized as being a low-risk, 3-7; a moderate risk and 8-9 is categorized as a problem gambler. Only people who reported 3-7 symptom (i.e., 'moderate gamblers') or 8-9 symptom (i.e., 'problem gamblers') were selected for the current analysis because as the focus was on readiness to change among people who engage in disordered gambling behavior.

Participants then completed a four-item self-discontinuity measure ( $\alpha = .95$ ; adapted from Iyer & Jetten, 2011) anchored at 1 (*strongly disagree*) and 7 (*strongly agree*). These items were: "*The person I was before I started gambling is different from the person I am now*", "*Gambling has changed who I am*", "*When I think about who I am now, it is different from who I was before I started gambling,*" and "*There is no*

*difference between who I am now and who I was before I started gambling*” (reverse coded).

Participants also completed a three-item measure of nostalgia ( $\alpha = .87$ ; adapted from Iyer & Jetten, 2011) anchored from 1 (*strongly disagree*) to 7 (*strongly agree*). These items were: “*I sometimes feel nostalgic for the life I had before I started gambling*”, “*I never miss the life I had before I started gambling*” (reverse coded), and “*I sometimes long for the life I had before gambling*”.

Lastly, participants completed a readiness to change questionnaire (adapted from Rollnick, Heather, Gold & Hall, 1992). This questionnaire contained nine total items with three items each corresponding to pre-contemplation, contemplation and action. Each item was anchored at 1 (*strongly disagree*) and 5 (*strongly agree*). Sample items included: “*It’s a waste of time thinking about my gambling*” (pre-contemplation), “*I enjoy my gambling, but sometimes I gamble too much*” (contemplation) and “*I have just recently changed my gambling habits*” (action). Participants were categorized to a stage of change by their highest total score corresponding to one of the three stages. In the event that a participant’s score corresponded to more than one stage, they were placed in the more advanced stage as instructed by Rollnick and colleagues (1992). Importantly, as progression toward behavioral change and not the psychology of people who have already taken action to alter their behavior was of interest, participants who reported being in the action stage of behaviour change were not included in the analyses.

An Ethics Certificate was obtained to conduct this study (as well as Studies 2 and 3) from the Research Ethics Board at the authors’ home institution.

## Results

**Preliminary analysis.** From the original sample of 276 participants, the PGSI identified 109 moderate and problem gamblers (72 males, 36 females, 1 unreported). The age of these moderate and problem gamblers ranged from 19 to 72 years ( $M = 34.38$ ,  $SD = 13.09$ , 4 unreported). Furthermore, out of the 109 moderate and problem gamblers identified by the PGSI the readiness to change questionnaire identified 56 gamblers in the pre-contemplation stage and 23 gamblers in the contemplation stage (52 males, 27 females), ranging in age from 19 to 72 ( $M = 34.21$ ,  $SD = 13.24$ , 4 unreported).

**Binary logistical regression.** Two separate binary logistical regressions were performed with readiness to change as the dependent variable and self-discontinuity and nostalgia as the predictor variables (see Table 1). The first used self-discontinuity as the predictor variable and the second use nostalgia as the predictor variable. A sense of self-discontinuity was a significant predictor of readiness to change among moderate and problem gamblers Wald's  $\chi^2(1) = 15.53$ ,  $p < .001$ . That is, readiness to change increased among moderate and problem gamblers as their sense of self-discontinuity increased,  $OR = 1.97$ . Nostalgia was also a significant predictor of readiness to change among moderate and problem gamblers, Wald's  $\chi^2(1) = 15.62$ ,  $p < .001$ . The more moderate and problem gamblers felt nostalgic for the past, the more likely they were to engage in behavioral change,  $OR = 2.08$ .

**Mediation analysis.** To examine if the relationship between a sense of self-discontinuity and readiness to change was mediated by nostalgia, Preacher and Hayes (2004) bootstrapping using 5000 iterations was performed. The indirect effect of self-discontinuity on readiness to change via nostalgia was estimated to lie between .03 to .67 using a 95% confidence interval (CI). As the CI did not include '0' the requirement for

mediation was established. That is, a sense of self-discontinuity increased readiness to change to the extent participants felt nostalgic for the past (see Figure 1).

## **Discussion**

Study 1 provided preliminary support for the general hypothesis that a sense of self-discontinuity facilitated readiness to change for people who engaged in addictive behaviors. Gamblers who perceived self-discontinuity between their past non-addicted and present addicted self reported an increase in readiness to change. The results are consistent with addiction therapies in which one technique to increase readiness to change involves highlighting the role the addictive behavior has had in a person's life, thus being able to highlight the discrepancy between the past and present self (Carr, 1998).

Furthermore, as predicted, nostalgia mediated the self-discontinuity effect on readiness to change. The results are consistent with Iyer and Jetten's (2012) findings that under conditions of self-discontinuity, people report an increased interest in recapturing the past. Indeed, the results of Study 1 suggest that the more the person with an addiction problem feels a longing to recapture the past when perceiving a discontinuity between the past and present self, the more likely they are to initiate behavioral change.

## **Study 2**

The goal of Study 2 was to extend the findings of Study 1 by experimentally manipulating a sense of self-discontinuity to establish a causal relationship between self-discontinuity and readiness to change. It was hypothesized that disordered gamblers who were exposed to a self-discontinuity manipulation would report a greater readiness to change compared to those exposed to a self-continuity manipulation, and that nostalgia

would once again mediate the relationship between self-discontinuity and readiness to change.

Moreover, Study 2 included a continuous measure of readiness to change that replaced the categorical measure used in Study 1. Specifically, Biener and Abrams (1991) pictorial measure of readiness to change was used for Study 2. This change was made because continuous measures allow more data to be retained compared to categorical measures (where variance is reduced due to the collapsing of responses into categories), thus increasing statistical power (see Cohen, 1983).

## **Method**

**Participants.** Participants consisted of 230 community gamblers (163 males, 67 females) who were recruited from MTurk. Participation was akin to Study 1, limited to those who were engaging in gambling activities (e.g., slot machines, poker, blackjack, roulette, sports betting) and who were not engaging in behavioral change (e.g., action stage), which were determined through eligibility requirements. Participants ranged in age from 18 to 62 years ( $M = 30.31$ ,  $SD = 8.82$ , 3 unreported). Restricting the analysis to moderate and problem gamblers, the final sample consisted of 80 moderate and problem gamblers (60 male, 20 female) with an age range from 20 to 62 years ( $M = 29.66$ ,  $SD = 7.83$ , 1 unreported).

**Procedure and materials.** Upon agreeing to participate in the study via MTurk, participants were then provided a link to an on-line survey hosted by Qualtrics. Once participants provided informed consent, they were randomly assigned to one of two conditions: a self-continuity or a self-discontinuity condition. In the self-discontinuity condition, participants read a research report stating that gambling can change people's moods, personalities, and behaviors leading to a loss in a sense of self. Participants were

then asked to reflect on the research findings and then briefly write how the research finding “was true for them”. In the self-continuity condition, participants read that gambling does not cause changes to gamblers moods, personalities, and behaviors and does not result in losing a sense of self. Like the self-discontinuity condition, participants were asked to reflect on the research findings and then briefly write how their gambling behavior has not changed their sense of self.

Thereafter participants completed a questionnaire battery that contained the self-continuity ( $\alpha = .96$ ) and nostalgia ( $\alpha = .79$ ) measures used in Study 1 (the self-discontinuity measure was included in Study 2 as a manipulation check). Participants also completed Biener and Abrams (1991) pictorial contemplation ladder adapted for disordered gambling. This continuous readiness to change measure is anchored from 0 to 10 with 0 indicating “*No thought of changing*”, 2 “*I think I need to consider changing someday*”, 5 “*I think I should change but not quite ready*”, 7 “*Starting to think about how to change my gambling patterns*” and 10 “*Taking action to change*”. Higher score indicate advancement toward action (which would be represented by a score of 10). All participants were redirected to a debriefing form after completion of the dependant measures.

## Results

**Assessed self-discontinuity as manipulation check.** A one-way between subjects analysis of variance (ANOVA) revealed a main effect of the experimental manipulation on levels of self-discontinuity,  $F(1, 79) = 72.68, p < .001, \eta_p^2 = .48$ . Participants in the self-discontinuity condition reported higher levels of self-discontinuity ( $M = 4.15, SD = 1.50$ ) compared to participants in the self-continuity condition ( $M = 1.71, SD = .85$ ).

**Main analysis.**

**Nostalgia.** A one-way between subjects ANOVA revealed a main effect of nostalgia between the experimental conditions,  $F(1, 79) = 13.77, p < .001, \eta_p^2 = .15$ . Participants in the self-discontinuity condition reported higher levels of nostalgia ( $M = 3.50, SD = 1.21$ ) compared to participants in the self-continuity condition ( $M = 2.64, SD = .68$ ).

**Readiness to change.** There was a significant main effect of the self-discontinuity manipulation on readiness to change  $F(1, 79) = 12.65, p = .001, \eta_p^2 = .14$ . Participants in the self-discontinuity condition reported higher levels of readiness to change ( $M = 3.57, SD = 3.51$ ) compared to participants in the self-continuity condition ( $M = 1.21, SD = 1.89$ ). The mean between the conditions suggest that gamblers in the self-discontinuity condition were in the contemplation stage, compared to gamblers in the self-continuity condition who reported being in the pre-contemplation stage. That is, the self-discontinuity manipulation motivated gamblers to contemplate behavioral change.

**Mediation analysis.** Preacher and Hayes (2004) bootstrapping method with 5000 iterations was once again used to test for mediation. As predicted, the indirect effect of self-discontinuity on readiness to change via nostalgia was estimated to lie between .54 and 1.86 with a 95% CI (see Figure 2). As such, self-discontinuity increased readiness to change as gamblers reported an increase desire to reclaim the more favorable past.

**Discussion**

Results of Study 2 provided causal support for the general hypothesis that self-discontinuity effects readiness to change. Participants felt a greater readiness to change their disordered gambling behaviors in the self-discontinuity condition compared to the self-continuity condition. Moreover, the self-discontinuity manipulation successfully

influenced nostalgia for the pre-addicted self – an effect that mediated the relationship between self-discontinuity and readiness to change. In Study 1, participants reported naturally occurring levels of self-discontinuity as well as nostalgia and readiness to change. In Study 2, nostalgia and readiness to change were facilitated when self-discontinuity was manipulated. If participants in the self-continuity condition had instead been placed in the self-discontinuity condition, they would presumably have felt quite differently about their readiness to change. Thus, Study 2 provided initial causal evidence that self-discontinuity can influence readiness to change among people engaging in addictive behaviors. Specifically, when people who are engaging in addictive behaviors are made to feel disconnected from their pre-addicted self, readiness to change increased (via nostalgic reverie for the past self). Results suggest an important link between the cognitive representation of the self and the reduction or elimination of addictive behavior.

Although the results of the preceding studies support the contention that self-discontinuity (a) increases nostalgia for the past and (b) motivates readiness to change, both studies 1 and 2 used disordered gambling as the target addiction in need of behavioral change. As such, results might be specific to disordered gamblers. It was thus imperative to determine if the self-discontinuity manipulation increases readiness to change among people engaging in a different behavior in need of change. In Study 3 the self-discontinuity manipulation was assessed among a sample of problem drinkers to assess whether the effects of self-discontinuity generalized to other forms of addictive behaviors.

### **Study 3**

The goal of Study 3 was to facilitate readiness to change among problem drinkers by manipulating their sense of self-discontinuity. Problem drinkers were chosen because,

much like disordered gambling, most problem drinkers report a relative unwillingness to change their behavior (Cunningham & Breslin, 2004; Freyer et al., 2005). Moreover, there is a paucity of research that has examined possible means to motivate readiness to change among problem drinkers. Akin to Studies 1 and 2, it was hypothesized that self-discontinuity salience would heighten readiness to change and that nostalgia would mediate this relationship.

### **Method**

**Participants.** Participants consisted of 191 community drinkers (102 males, 89 females) from the United States who were recruited from MTurk. They ranged in age from 21 to 68 years ( $M = 33.93$ ,  $SD = 11.46$ , 2 unreported). Participation was limited to those who 1) were of legal drink age or over in the United States (21+) and 2) were currently users of alcohol. As in Studies 1 and 2, results are restricted to people who report engaging in problematic behavior – in this case problematic drinking.

Symptomatology was assessed with the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993), with participants who scored 8 and above being categorized as problem drinkers (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). Restricting analysis to only problem drinkers reduced the original sample of 191 participants to 74 problem drinkers (50 males, 24 females) who ranged in age from 21 to 53 years ( $M = 29.81$ ,  $SD = 7.30$ , 1 unreported).

**Procedure and Materials.** The procedure for Study 3 was identical to those used in Study 2 except the PGSI (a measure of gambling symptomology) was replaced with the AUDIT (Saunders et al., 1993) – a 10-item questionnaire that assesses levels of drinking severity. Specifically, the AUDIT contains items that assess frequency of alcohol consumption “*How often do you have six or more drinks on one occasion?*” and

items that assess the consequences of drinking “*Have you or someone else been injured as a result of you drinking?*” Items were anchored from 0 to 4, with higher scores indicating greater problem drinking symptomology. Scores are calculated by taking the sum of all the items to obtain a total score, which is then used to categorize participants as either a non-problem (a score of 0-7) or problem drinker (a score of 8 or more).

Upon the completion of the AUDIT, participants completed a questionnaire battery identical to the one used in Study 2 with the exception of two changes. First, the term “gambling” was replaced with the term “drinking” in the self-discontinuity measure ( $\alpha = .95$ ) as well as the measure that assessed nostalgia ( $\alpha = .91$ ) and readiness to change. Second, in addition to the pictorial measure of readiness to change, a face valid item measure of readiness to change was included to provide further support for the hypothesized meditation model. The face valid item asked participants to “*Select a number that best describes your desire to change your drinking behaviors at this time*”. The item was anchored at 0 (*no desire*) and 9 (*full desire*).

## Results

**Assessed self-discontinuity as manipulation check.** A one-way between subjects ANOVA revealed a significant main effect of the manipulation on self-discontinuity,  $F(1, 73) = 42.44, p < .001, \eta_p^2 = .37$ . Problem drinkers who were assigned to the self-discontinuity manipulation reported higher levels of self-discontinuity ( $M = 5.0, SD = 1.42$ ) compared to participants who were exposed to the self-continuity condition ( $M = 2.94, SD = 1.28$ ).

## Main analysis.

**Nostalgia.** A one-way between subjects ANOVA revealed a main effect of nostalgia between the experimental conditions,  $F(1, 73) = 4.64, p = .04, \eta_p^2 = .06$ . That is,

problem drinkers who were exposed to the self-discontinuity condition reported higher levels of nostalgia ( $M = 3.87$ ,  $SD = 1.49$ ) than participants in the self-continuity condition ( $M = 3.19$ ,  $SD = 1.20$ ).

**Readiness to change.** There was no significant main effect of the self-discontinuity manipulation on the pictorial measure of readiness to change  $F(1, 73) = .04$ ,  $p = .85$ . Participants in the self-discontinuity condition did not report significantly higher levels of readiness to change ( $M = 3.50$ ,  $SD = 3.55$ ) compared to participants in the self-continuity condition ( $M = 3.36$ ,  $SD = 2.78$ ). There was also no significant difference in readiness to change as measured by the face valid item  $F(1, 73) = .78$ ,  $p = .38$ ,  $\eta_p^2 = .01$ . Problem drinkers who were assigned to the self-discontinuity condition did not report increased desire to engage in behavioral change ( $M = 4.45$ ,  $SD = 3.1$ ) than problem drinkers in the self-continuity condition ( $M = 3.89$ ,  $SD = 2.32$ ).

**Mediation analysis.** Although a direct effect of the manipulation on readiness to change was not observed, according to Preacher and Hayes (2004) and others (MacKinnon, Fairchild, & Fritz, 2007; Wu & Zumbo, 2007), a significant effect between the independent and the dependent variable is not required when proposing a significant indirect effect. All that is required to test for the indirect effect is a significant direct effect of the independent variable (self-discontinuity) on the proposed mediator (nostalgia) and a significant direct effect of the proposed mediator (nostalgia) on the dependent variable (readiness to change). As these associations were already established using ANOVA, mediation analysis was pursued using Preacher and Hayes (2004) bootstrapping with 5000 iterations. As in Studies 1 and 2, there was a significant indirect effect of self-discontinuity on pictorial measure of readiness to change via nostalgia, thus

establishing mediation. Specifically, the indirect effect was estimated to lie between .09 and 1.43 using a 95% CI (see Figure 3).

Importantly, mediation was also observed when the face valid measure of readiness to change was used as the dependent variable. Specifically, the indirect effect of self-discontinuity on readiness to change via nostalgia was estimated to lie between .11 and 1.41 with 95% CI.

## **Discussion**

The purpose of Study 3 was to test the generalizability of the predicted mediation model with a sample of problem drinkers. In line with the proposed mediation model, problem drinkers who were manipulated to feel a sense of self-discontinuity reported more nostalgic reverie than participants in the self-continuity condition. Interestingly however, problem drinkers who were exposed to the self-discontinuity manipulation did not report a greater increase in readiness to change compared to those in the self-continuity manipulation, a result that is in contrast to disordered gamblers. Having said that, the results showed that problem drinkers' desire to return to the more favorable past was a significant motivator to engage in behavioral change among problem drinkers. That is, much like disordered gamblers, problem drinkers who felt a fundamental difference from the past non-drinking to their present drinking self reported an increased desire to return to the non-drinking self, which increased the desire to engage in behavioral change.

## **General Discussion**

Undeniably, cessation is difficult for people engaged in addictive behaviors like gambling or drinking. Although the person engaging in addictive behaviors might understand that their behavior is yielding negative consequences for the self, reported

readiness to change is typically very low. Moreover, there is a lack of empirical research on methods to motivate readiness to change among people engaging in addictive behaviors. In the current set of studies, evidence was found that readiness to change is facilitated by heightened levels of perceived self-discontinuity. Although previous work (Miller & Rollnick, 2002; Nuske & Hing, 2012) has hinted that self-discontinuity might influence behavioral change, the present research, to the authors' knowledge, is the first to empirically assess and manipulate self-discontinuity to motivate change.

In line with theoretical arguments put forth by Miller and Rollnick (2002) as well as Nuske and Hing (2012), the above studies advanced the prediction that a sense of self-discontinuity between the past non-addicted and present addicted self would lead to an increase in readiness to change among disordered gamblers and problem drinkers. Consistent with the proposed hypothesis, the results of the studies showed that heightened levels of self-discontinuity – be it assessed (Study 1) or manipulated (Studies 2 and 3) –between the past “non-addicted” and present “addicted” self, led to an increased desire to engage in behavioral change via nostalgia. Specifically, in Study 1, the results showed that the more the disordered gamblers perceived the present self to be incongruent with the past self (i.e., a heightened sense of self-discontinuity), the more they desired to return to the past, which resulted in a greater readiness to engage in behavioral change. In Study 2, to provide causal support, self-discontinuity was manipulated. Disordered gamblers who were made to feel self-discontinuous reported increased readiness to change than those who were made to see self-continuity. Study 3 replicated and extended the effects observed in Study 2 among a sample of problem drinkers. Moreover, across all three studies, nostalgia was the mediating variable between self-discontinuity and readiness to change.

Interestingly, for problem drinkers the self-discontinuity manipulation did not have a significant direct main effect on readiness to change. Specifically, problem drinkers who were assigned to the self-discontinuity condition did not report a greater readiness to change as measured by either the pictorial or face valid item of readiness to change than those in the self-continuity condition. The lack of a significant direct effect of the self-discontinuity manipulation on readiness to change suggests that disordered gamblers and problem drinkers may differ in what motivated their desire to engage in behavioral change.

One possible reason why self-discontinuity may not motivate readiness to change among problem drinkers is that drinking is a psychoactive substance that is ingested to get the desired effects. As such, problem drinkers may feel self-discontinuity with their non-drinking self only when under the influence of the psychoactive substance – when sober, a sense of self-continuity may return. Conversely, gambling does not require the ingestion of a psychoactive substance. Thus, the gambler is not (theoretically) physiologically altered when gambling. As such, it would be difficult for a gambler to argue that he or she is a different person only under the influence of gambling. In this way, gamblers may be more apt to believe (naturally or via manipulation) that the pre-gambling self is different from the current gambling self. The net effect would be (as demonstrated) that disordered gamblers, but not problem drinkers, benefit from a self-discontinuity manipulation, to move from addiction to action.

Having said that, the results across three studies suggest that incongruence between the past and present self can motivate the desire to engage in behavioral change. This supposition is in accordance with Miller and Rollnick's (2002) observation that people who are in treatment for their addictive behaviors often view the past self as being

more favorable than the present self – a view of the self-concept that is contrary to the view held by most “healthy” people that the present self is better than the past self (see Wilson & Ross, 2001). In other words, people tend to see the passage of time as facilitating personal growth and thus the present self is perceived to be a better version of the self than the past self (Wilson & Ross, 2001). However, those in treatment for their addictive behaviors may perceive the passage of time – past to the present day – as synonymous with the progression toward addiction. In this way, the past self is a better version of the self than the present self. As shown in the present research, feeling a sense of self-discontinuity between the present “addicted” (i.e., “worse”) self and the past “non-addicted” (i.e., “better”) self heightened the motivation towards behavioral change.

Importantly, nostalgia was tested as a mechanism by which self-discontinuity facilitates readiness to change as previous research has shown that a sense of self-discontinuity led to an increased desire to return to the past (Iyer & Jetten, 2011). Moreover, anecdotal reports from treatment suggest that people engaging in addictive behaviors often express a desire to return to a time in their lives when the addiction had not yet taken hold (see Berg & Miller, 1991) – a sentiment that appeared to motivate change. Across all three studies, nostalgia was a significant mediator of the effect of self-discontinuity on readiness to change. Specifically, self-discontinuity increased readiness to change by heightening nostalgic reverie for the pre-addicted self.

### **Implications and Caveats**

People who are engaging in addictive behaviors typically know that their addictive behaviors are associated with a host of negative consequences. At least intuitively then, readiness to change should increase as an addiction takes hold – an unfortunately incorrect intuition. People engaged in addictive behavior report surprisingly

low levels of readiness to change. For example, less than one percent of gamblers seek professional treatment for their gambling behaviors (Wiebe & Turner, 2001). Herein, across three studies, the results provided converging evidence that self-discontinuity is central to the readiness to change process. Specifically, readiness to change is heightened when self-discontinuity is made salient. These findings have important implications for the readiness to change literature – a literature that has been relatively absent of concrete, easily applied means to move people who are engaging in addictive behaviors from addiction to change.

Self-discontinuity manipulation could easily be incorporated into help-oriented brochures and websites (self-help and professional care alike). Doing so might be an effective way to initiate the change process. The ensuing increase in motivation to change may be the difference between taking action or continued persistence of the addictive behavior. In the spirit of Berg and Miller (1991), small changes in motivation to change as seen in the current research can act as the catalyst to bigger and profound changes in modifying addictive behaviors. However, it should be noted that due to self-discontinuity manipulation failing to move problem drinkers to action, for this population, a nostalgia manipulation might be more effective in moving problem drinkers towards action. Indeed, across all three studies (i.e., with both disordered gamblers and problem drinkers) nostalgia was the more significant predictor of readiness to change than self-discontinuity. Thus, future studies should assess whether a nostalgia manipulation provides a stronger effect in moving people from addiction to action, especially among a sample of problem drinkers. Moreover, it may be possible to create a nostalgia manipulation that also taps into self-discontinuity and thus, this sort of manipulation may

have the most utility in increasing readiness to change among both problem drinkers and disordered gamblers.

Despite the results across three studies suggesting that, self-discontinuity manipulation moves people from the pre-contemplation to the contemplation stage, this increased readiness to change may be transitory. Once the participant is placed into a context in which the addictive substance or object is close at hand, they might slip back into pre-contemplation. However, regression to previous stages is not uncommon (and is, in fact, expected) according to the TTM (see DiClemente et al., 1991). Thus, repeated exposures to a self-discontinuity manipulation might be necessary to advance people engaging in addictive behaviors to the action stage. Moreover it is not yet clear whether the self-discontinuity manipulation effects readiness to change in a manner that ultimately leads to more rapid progression to action. That is, the current study did not follow participants longitudinally to assess if the self-discontinuity manipulation resulted in actual behavioral change. However, increased readiness to change has shown to be predictive of future change (Carey et al., 2002; Ledgerwood et al., 2013). Future research should assess whether gamblers or drinkers who are exposed to a self-discontinuity manipulation are more likely to modify their behavior over time than those not exposed.

### **Conclusion**

Most people appear unwilling to change their chronic addictive behavior despite the negative consequences that typically result. The current research took a novel approach to catalyze readiness to change among people engaged in addictive behaviors who typically report an unwillingness to do so by examining the potential influence of self-discontinuity. Across three studies, the results showed that perceiving the current 'addicted' self as fundamentally different from the past 'non-addicted' self can catalyze

readiness to change. Thus, unlike Milligan's (2003) contention that a sense of self-discontinuity should be avoided, results presented herein suggest that in certain context self-discontinuity should be harnessed and highlighted. Indeed, among those living an addiction, self-discontinuity can help forge a path towards behavioral change.

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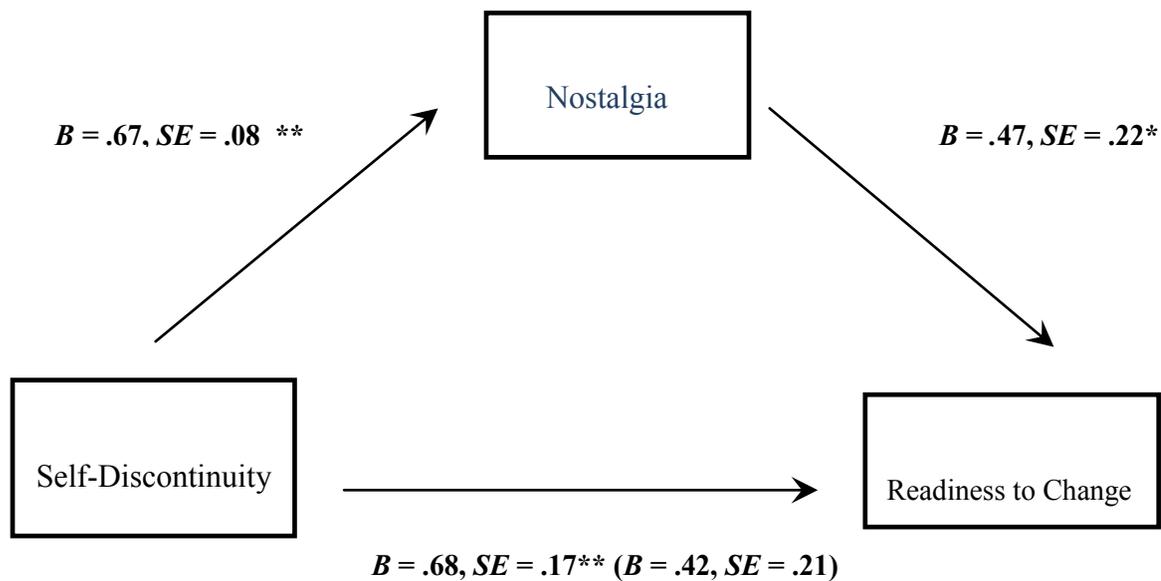
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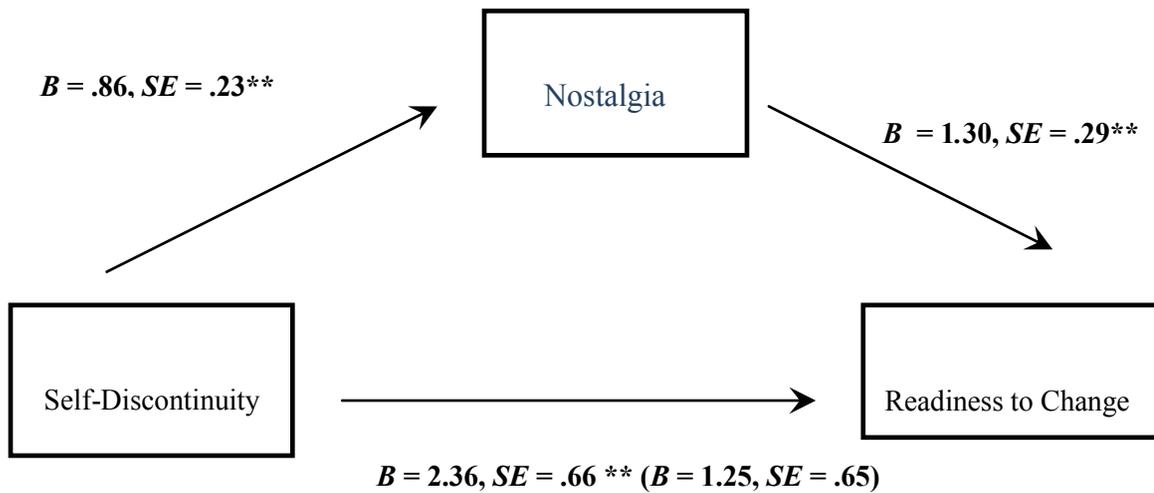
Table 1.

*Summary of binary logistic regression for readiness to change*

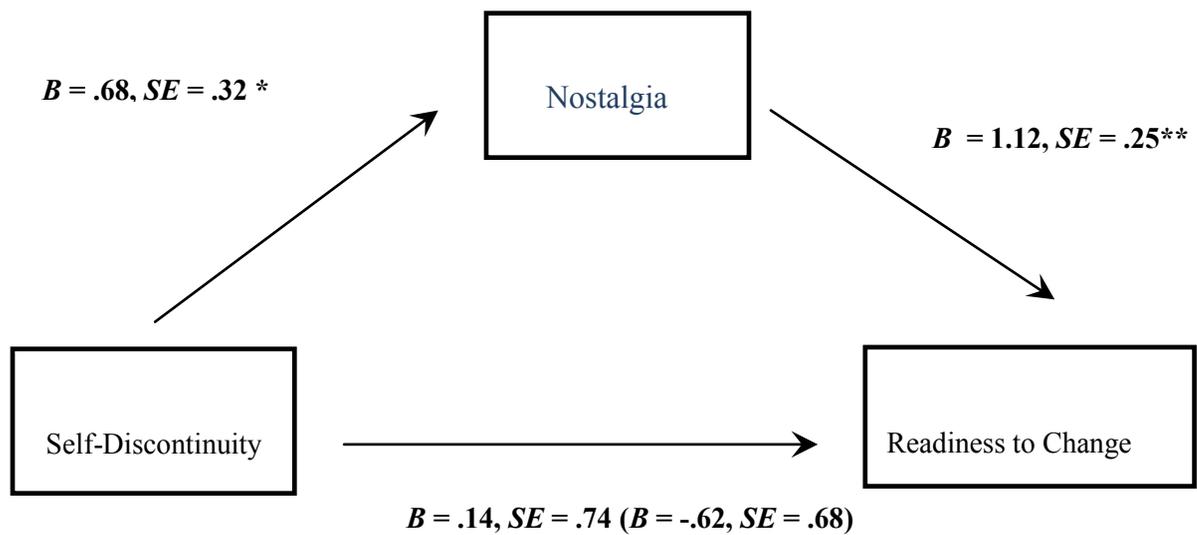
Variable	B	SE	Wald's $\chi^2$	df	Sig	Exp(B)	95 CI	
							LL	UL
Self-Discontinuity	.68	.17	15.53	1	.001	1.97	1.41	2.76
Nostalgia	.73	.19	15.62	1	.001	2.08	1.45	3.00



*Figure 1.* Mediation model with self-discontinuity as the independent variable, nostalgia as the mediator, and the categorical measure of readiness to change as the dependent variable (coded as 1 = precontemplation, 2 = contemplation) among a sample of disordered gamblers: Study 1. The unstandardized coefficients and standard error shown in parentheses reflect the inclusion of the mediator in the equation. Unstandardized coefficients and standard error with an asterisk indicates a significant path,  $p < .05$ . and two asterisks indicates a significant path,  $p < .001$ .



*Figure 2.* Mediation model with the self-discontinuity manipulation as the independent variable (coded as 0 = self-continuity and 1 = self-discontinuity, nostalgia as the mediator, and the pictorial measure of readiness to change as the dependent variable among a sample of disordered gamblers: Study 2. The unstandardized coefficients and standard error shown in parentheses reflect the inclusion of the mediator in the equation. Unstandardized coefficients and standard error with two asterisks indicates a significant path,  $p < .001$ .



*Figure 3.* Mediation model with the self-discontinuity manipulation as the independent variable (coded as 0 = self-continuity and 1 = self-discontinuity, nostalgia as the mediator, and the pictorial measure of readiness to change as the dependent variable among a sample of problem drinkers: Study 3. The unstandardized coefficients and standard error shown in parentheses reflect the inclusion of the mediator in the equation. Unstandardized coefficients and standard error with an asterisk indicates a significant path,  $p < .05$  and two asterisks indicates a significant path,  $p < .001$ .

## STUDY 1 MATERIALS

### Appendix A: Recruitment Announcement:

#### Announcement for MTurk

#### Perceptions of Responsible Gambling Study (25mins/\$0.50)

Only people who gamble (e.g., buy lottery tickets, play slots machines or table games at a gambling venue, i.e., casino or online) are eligible for this study.

In this study you will be asked to answer a variety of questions about gambling. Specifically, you will be asked to answer a variety of questions about your gambling behavior (when and why you gamble) as well as your self-perceptions (life satisfaction and beliefs about who you are today compared to your past).

Your participation as well as your responses will be strictly confidential. Only researchers associated with the research project will know you participated in the study and no one will know how you responded to the questions asked. In addition, your responses will be anonymous and you will not be asked any identifying information.

We can anticipate no physical discomfort to you as a result of your participation in this study. You may, however, experience anxiety or distress when thinking about past or current gambling activities. In the event you feel anxiety or distress, information will be provided linking you to appropriate health services in your local area.

#### Eligibility Requirements:

1. Resident of the United States of America.
2. Must be currently or in the past participated in at least one form of gambling activity (e.g. poker, blackjack, roulette, slot machine, sports betting etc).

This study takes about 25 minutes, and upon completion you will receive US\$0.50 for your participation.

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This study has received clearance by the Carleton University Psychology Research Ethics Board (Reference #13-135)

## Appendix B: Informed Consent Form

The purpose of an informed consent is to insure that you understand the purpose of the study and the nature of your involvement. The informed consent must provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

This study has received clearance by the Carleton University Psychology Research Ethics Board (Reference #13-135).

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**Present study:** Perceptions of responsible gambling.

**Research personnel:** Andrew (Hyouon) Kim (Principal Investigator, Hyouon\_Kim@carleton.ca)

Dr. Michael J. A. Wohl (Faculty Investigator, (613) 520-2600, ext. 2908; Michael\_Wohl@carleton.ca)

Should you have any ethical concerns about this research, please contact Dr. Avi Parush, Chair, Carleton University Psychology Research Ethics Board ([Avi\\_Parush@carleton.ca](mailto:Avi_Parush@carleton.ca) (613) 520-2600 ext. 6026). For any other concerns, please contact, Dr. Anne Bowker (Chair, Department of Psychology, 1 (613) 520-2600, ext. 8218, [psychchair@carleton.ca](mailto:psychchair@carleton.ca)).

**Purpose and Task requirements:** The aim of this study is to assess perceptions of responsible gambling and attitudes towards treatment. As a participant, you will be asked to answer a variety of questions about your gambling behavior (when and why you gamble) as well as your self-perceptions (life satisfaction and beliefs about who you are today compared to your past).

Be assured that your name will not be associated in any way with the research findings. We are offering participants who complete the study US \$0.50 for participating.

**Duration and locale:** The survey will be administered on-line and should take approximately 25 minutes to complete.

**Potential risk/discomfort:** We can anticipate no physical discomfort to you as a result of your participation in this study. You may, however, experience some stress when thinking about past or current gambling activities. If you do experience any distress or discomfort, you may wish to contact one of the helplines nearest to your location. A list of helplines by town and state can be found at <http://www.ncpgambling.org/i4a/pages/index.cfm?pageid=1>. A copy of this information will be provided to you in the debriefing sheet following the questionnaires.

**Right to withdraw:** Your participation in this study is entirely voluntary. At any point during the study you have the right to not complete certain questions or to withdraw with

no penalty whatsoever. To withdraw at any point, simply click the “withdrawal” button to reach the debriefing page.

**Anonymity/Confidentiality:** The data collected in this study are confidential. There will be no identifying information attached to your data. The coded data are made available only to the researchers associated with this project.

We collect data through the software Qualtrics, which uses servers with multiple layers of security to protect the privacy of the data (e.g., encrypted websites and pass-word protected storage). Please note that Qualtrics is hosted by a server located in the USA. The United States Patriot Act permits U.S. law enforcement officials, for the purpose of an anti-terrorism investigation, to seek a court order that allows access to the personal records of any person without that person's knowledge. In view of this we cannot absolutely guarantee the full confidentiality and anonymity of your data. With your consent to participate in this study you acknowledge this.

---

By checking this box you agree to the following terms:

I have read the above form and understand the conditions of my participation. My participation in this study is voluntary, and if for any reason, at any time, I wish to leave the experiment I may do so without having to give an explanation and with no penalty whatsoever. Furthermore, I am also aware that my participation as well as the data gathered in this study is confidential. Checking the box below and clicking ‘Next’ indicates that I agree to participate in the study

**Appendix C: Questionnaire Package*****Background***

1. Age:

2. Gender (circle one): Male / Female

3. Ethnicity (circle #from a-h below):

- a) Caucasian/European origin
- b) African-Canadian/American
- c) East Asian (Chinese, Japanese, Korean)
- d) South Asian (Indian, Pakistani, Sri Lankan, etc.)
- e) Middle Eastern
- f) Native Canadian/American
- g) Hispanic and South American Origin
- h) Other or multi-ethnic origin

4. Circle the game you MOST prefer to play:

- a) Slots
- b) Electronic gambling machines
- c) Poker
- d) Black Jack
- e) Roulette
- f) Pro-line or sports betting
- g) Lottery
- h) Scratch Tickets
- i) Other (please specify) \_\_\_\_\_

5. Do you currently gamble? (circle one from 'a' to 'd' below)

- a) YES, I currently gamble
- b) NO, I quit or cut back significantly within the last 6 months
- c) NO, I quit or cut back significantly more than 6 months ago
- d) NO, I have never gambled

6. If you answered YES to question, how often do you gamble

- \_\_\_ More than once a day
- \_\_\_ More than once a week
- \_\_\_ More than once a month
- \_\_\_ More than once every 3 months
- \_\_\_ Less than once every 3 months

7. How long have you gambled for? (Please answer in years, then months)

\_\_\_\_\_

8. Where do you typically gamble (e.g., home/internet, casino, etc.)?

\_\_\_\_\_

9. Have you currently or in the past received treatment for gambling related problems?

- a) YES, currently
- b) YES, in the past

NO.

10. Are you seriously thinking of quitting or cutting down on your gambling?

- c) YES, within the next 30 days
- d) YES, within the next 6 months

NO, not thinking of quitting or cutting down

11. I have a gambling problem.

YES            NO

**Problem Gambling Severity Index (PGSI)**

In the past 12 months how often ...

1. Have you bet more than you could really afford to lose?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

2. Have you needed to gamble with larger amounts of money to get the same feeling of excitement?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

3. Have you gone back another to try and win back the money you lost?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

4. Have you borrowed money or sold anything to get money to gamble?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

5. Have you felt that you might have a problem with gambling?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

6. Have you felt that gambling has caused you any health problems, including stress or anxiety?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

7. Have people criticized your betting or told you that you have a gambling problem, whether or not you thought it is true?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

8. Have you felt your gambling has caused financial problems for you or your household?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

9. Have you felt guilty about the way you gamble or what happens when you gamble?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

### Stanford Time Perspective Inventory

Please read each of the questions below carefully, and then decide whether you are characteristic or uncharacteristic regarding the statements. Please mark the answer of your choice to each question according to the following scale.

1	2	3	4	5
Very Uncharacteristic	Uncharacteristic	Neither Uncharacteristic Nor Characteristic	Characteristic	Very Characteristic
_____ 1. I think about the bad things that have happened to me in the past.				
_____ 2. I do things impulsively.				
_____ 3. I take each day as it is rather than try to plan it out.				
_____ 4. It gives me pleasure to think about the past				
_____ 5. Often luck pays off better than hard work.				

### Attitude Towards Treatment

Please read each of the questions below carefully, and then decide whether you agree or disagree with the following statement. Please mark the answer of your choice to each question according to the following scale.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
____ 1. A person should work out his or her own gambling problems; getting gambling counseling would be a last resort.				
____ 2. The idea of talking about gambling problems with a counselor strikes me as a poor way to get rid of my gambling problems.				
____ 3. If I were experiencing a serious gambling problem at this point in my life, I would be confident that I could find relief in counseling.				
____ 4. There is something admirable in the attitude of a person who is willing to cope with his or her conflicts and fears caused by gambling without resorting to counseling.				
____ 5. I would want to get professional help if I were worried or upset for a long period of time due to my gambling.				

### Nostalgia Inventory Scale

Using the following scale, please indicate if you agree or disagree with the following statements. Please mark the answer of your choice to each question according to the following scale.

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

<input type="text"/> 1. I sometimes feel nostalgic for the life I had before I started gambling.
<input type="text"/> 2. I never miss the life I had before I started gambling.
<input type="text"/> 3. I sometimes long for the life I had before gambling.

**Self- Continuity**

Using the following scale, please indicate if you agree or disagree with the following statements. Please mark the answer of your choice to each question according to the following scale.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

_____ 1. Gambling has changed who I am.
_____ 2. There is no difference between who I am now and who I was before I started gambling.
_____ 3. The person I was before I started gambling is different from the person I am now.
_____ 4. When I think about who I am now, it is different from who I was before I started gambling.

### Life Satisfaction

Below are five statements with which you may agree or disagree. Using the 1 -7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding. The 7-point scale is as follows:

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

_____ 1. In most ways my life is close to my ideal.
_____ 2. The conditions of my life are excellent.
_____ 3. I am satisfied with my life.
_____ 4. So far I have gotten the important things I want in life.
_____ 5. If I could live my life over, I would change almost nothing.

### Gambling Readiness to Change Scale

The following questionnaire is designed to identify how you personally feel about your gambling right now. Please read each of the questions below carefully, and then decide whether you agree or disagree with the statements. Please mark the answer of your choice to each question according to the following scale.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
_____ 1. I enjoy my gambling, but sometimes I gamble too much.				
_____ 2. Sometimes I think I should cut down on my gambling.				
_____ 3. It's a waste of time thinking about my gambling.				
_____ 4. I have just recently changed my gambling habits.				
_____ 5. Anyone can talk about wanting to do something about gambling, but I am actually doing something about it.				
_____ 6. My gambling is a problem sometimes.				
_____ 7. There is no need for me to think about changing my gambling.				
_____ 8. I am actually changing my gambling habits right now.				
_____ 9. Gambling less would be pointless for me.				

**Gambling-Related Experiences**

Please provide a short answer to the following items.

1. Have you heard of the term “Responsible Gambling?”



YES

NO

IF YES, Where?

2. What does “Responsible Gambling” mean to you?

3. How likely are you to set a money limit when gambling?

1	2	3	4	5	6	7
Not likely				Very likely		

4. How likely are you to set a time limit when gambling?

1	2	3	4	5	6	7
Not likely				Very likely		

5. Please describe a time in which you decided to set a limit on your play and were able to adhere to that limit

6. Please describe a time in which you decided to set a limit on your play and were NOT able to adhere to that limit. What would have helped you adhere to the limit.

## **Appendix D: Debriefing**

This study has received clearance by the Carleton University Psychology Research Ethics Board (Reference #13-135).

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**Thank you for participating in this study!** This post-survey information is provided to inform you of the exact nature of the research you just participated in.

### **Compensation**

As the compensation for the study will be given directly by MTurk, we do not require any personal or identifying information.

### **What are we trying to learn in this research?**

Past research has shown gambling can develop into an addiction, causing harm to an individual's well-being. To help reduce the chances that an individual will develop a gambling addiction, governments have implemented a variety of measures to reduce the risk of developing a gambling addiction and programs to help those who are experiencing gambling-related harms. However, past studies have shown that gamblers' attitudes and perceptions may influence how likely a gambler is willing and motivated to use responsible gambling tools and or seek professional help should their behavior become problematic.

In this study we were interested in a) gamblers' understanding of responsible gambling and how to do so effectively and b) gamblers' attitudes toward seeking professional help should their gambling behavior become problematic (e.g., playing excessively). In order to assess these two things, we had you complete questionnaires that directly assessed your knowledge of responsible gambling and the frequency within which you do so. For example, we asked if you tend to set money and time limits on your play and the extent to which you adhere to those limits. A major component of responsible gambling is setting such limits and keeping to those limits. We also asked you items about your attitudes toward treatment. We believe that the greater the perceived difference between who you think you were before you started gambling and who you think you are now will be associated with more positive attitudes toward treatment.

### **Why is this important to scientists or the general public?**

This research will contribute to our knowledge and understanding of responsible gambling. More importantly, the data obtained in this study will be used to develop more effective responsible gambling tools and modify perceptions regarding these tools so they might be more appealing to use. In addition, the data may help in designing and implementing future studies that examine how we may use self-continuity to increase motivation to seek treatment.

### **What are our hypotheses and predictions?**

We predict that individuals who score higher in gambling pathology will view their past self more favorably than their current self, leading to low self-continuity. The greater the discrepancy between how the current self is viewed compared to past self will lead to greater motivation to seek treatment.

**Is there anything I can do if I found this experiment to be emotionally upsetting?**

Yes, if you feel any distress or anxiety after participating in this study there are a number of agencies that offer confidential services for Problem Gambling. A list of helplines by town and state can be found at

<http://www.ncpgambling.org/i4a/pages/index.cfm?pageid=1>.

**Where can I get more resources on gambling research?**

If you are interested in additional resources for gambling related resources, The National Center for Responsible Gambling <http://www.ncrg.org/> has a wealth of current research, information and confidential services for gambling and problem gambling research.

Additional resources can be found at <http://www.rgrc.org/en>

**What if I have questions later?**

If you have any other questions or comments about this research, please feel free to contact Andrew (Hyouun) Kim ([hyoun\\_kim@carleton.ca](mailto:hyoun_kim@carleton.ca)) or Dr. Michael J. A. Wohl ([michael\\_wohl@carleton.ca](mailto:michael_wohl@carleton.ca)).

Should you have any ethical concerns about this research, please contact Dr. Avi Parush (Chair, Psychology Ethics Board, 1 (613) 520-2600 ext. 6026, [avi\\_parush@carleton.ca](mailto:avi_parush@carleton.ca)). For any other concerns, please contact, Dr. Anne Bowker (Chair, Department of Psychology, 1 (613) 520-2600, ext. 8218, [psychchair@carleton.ca](mailto:psychchair@carleton.ca)).

**Thank you for participating in this study!** We greatly appreciate your participation in the current study.

## STUDY 2 MATERIALS

### Appendix A: Recruitment Announcement:

#### Announcement for MTurk

##### Perceptions of Self-Continuity and Gambling Study (15mins/\$.50)

Only people who gamble (e.g., buy lottery tickets, play slots machines or table games at a gambling venue, i.e., casino or online) are eligible for this study.

In this study you will be asked to answer a variety of questions about gambling. Specifically, you will be asked to answer a variety of questions about your gambling behavior (preferred type of gambling, frequency) as well, you will be asked to reflect and state the effects that gambling has had on your self-concept based on recent research findings. In addition, you will be asked to complete several questionnaires assessing self-continuity (i.e., the feeling that the self is fundamentally the same despite physical and psychological changes), nostalgia and readiness to change your gambling behavior.

Your participation as well as your responses will be strictly confidential. Only researchers associated with the research project will know you have participated in the study and no one will know how you responded to the questions asked. In addition, your responses will be anonymous and you will not be asked any identifying information.

We can anticipate no physical discomfort to you as a result of your participation in this study. You may, however, experience anxiety or distress when thinking about past or current gambling activities. In the event you feel anxiety or distress, information will be provided linking you to appropriate health services in your local area.

#### Eligibility Requirements:

1. Resident of the United States of America.
2. Must be currently or in the past participated in at least one form of gambling activity (e.g. poker, blackjack, roulette, slot machine, sports betting etc).

This study takes about 15 minutes, and upon completion you will receive US\$.50 for your participation.

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This study has received clearance by the Carleton University Psychology Research Ethics Board (Reference #13-160).

## Appendix B: Informed Consent Form

The purpose of an informed consent is to ensure that you understand the purpose of the study and the nature of your involvement. The informed consent must provide sufficient information, such that you have the opportunity to determine whether you wish to participate in the study.

This study has received clearance by the Carleton University Psychology Research Ethics Board (Reference #13-160)

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**Present study:** Perceptions of self-continuity and gambling.

**Research personnel:** Andrew (Hyouon) Kim (Principal Investigator, Hyouon.Kim@carleton.ca)

Dr. Michael J. A. Wohl (Faculty Investigator, (613) 520-2600, ext. 2908; Michael.Wohl@carleton.ca)

Should you have any ethical concerns about this research, please contact Dr. Shelley Brown, Chair, Carleton University Psychology Research Ethics Board at [Shelley.Brown@carleton.ca](mailto:Shelley.Brown@carleton.ca), (613) 520-2600 ext. 1505). For any other concerns, please contact, Dr. Anne Bowker (Chair, Department of Psychology, 1 (613) 520-2600, ext. 8218, [psychchair@carleton.ca](mailto:psychchair@carleton.ca)).

**Purpose and Task requirements:** The aim of this study is to assess a sense of self-continuity (i.e., the feeling that the self is fundamentally the same despite physical and psychological changes) and levels of nostalgia. As a participant, you will be asked to answer a variety of questions about your gambling behavior (preferred type of gambling, frequency of gambling) and you will be asked to reflect and state the effects that gambling has had on your self-concept based on recent research findings. In addition, you will be asked to complete several questionnaires assessing your perceptions of self-continuity, nostalgia and readiness to change your gambling behavior.

Be assured that your name will not be associated in any way with the research findings. We are offering eligible participants who complete the study US \$0.50 for participating.

**Duration and locale:** The survey will be administered on-line and should take approximately 15 minutes to complete.

**Potential risk/discomfort:** We can anticipate no physical discomfort to you as a result of your participation in this study. You may, however, experience some stress when thinking about past or current gambling activities. If you do experience any distress or discomfort, you may wish to contact one of the helplines nearest to your location. A list of helplines by town and state can be found at

<http://www.ncpgambling.org/i4a/pages/index.cfm?pageid=1>. A copy of this information will be provided to you in the debriefing sheet following the questionnaires.

**Right to withdraw:** Your participation in this study is entirely voluntary. At any point during the study you have the right to not complete certain questions or to withdraw with no penalty whatsoever. To withdraw at any point, simply click the “withdrawal” button to reach the debriefing page.

**Anonymity/Confidentiality:** The data collected in this study are confidential. There will be no identifying information attached to your data. The coded data are made available only to the researchers associated with this project.

We collect data through the software Qualtrics, which uses servers with multiple layers of security to protect the privacy of the data (e.g., encrypted websites and pass-word protected storage). Please note that Qualtrics is hosted by a server located in the USA. The United States Patriot Act permits U.S. law enforcement officials, for the purpose of an anti-terrorism investigation, to seek a court order that allows access to the personal records of any person without that person's knowledge. In view of this we cannot absolutely guarantee the full confidentiality and anonymity of your data. With your consent to participate in this study you acknowledge this.

---

By checking this box you agree to the following terms:

I have read the above form and understand the conditions of my participation. My participation in this study is voluntary, and if for any reason, at any time, I wish to leave the experiment I may do so without having to give an explanation and with no penalty whatsoever. Furthermore, I am also aware that my participation as well as the data gathered in this study is confidential. Checking the box below and clicking ‘Next’ indicates that I agree to participate in the study.

### Appendix C: Demographic Information

#### *Background*

1. Age:

2. Gender (circle one): Male / Female

3. Ethnicity (circle #from a-h below):

- i) Caucasian/European origin
- j) African-Canadian/American
- k) East Asian (Chinese, Japanese, Korean)
- l) South Asian (Indian, Pakistani, Sri Lankan, etc.)
- m) Middle Eastern
- n) Native Canadian/American
- o) Hispanic and South American Origin
- p) Other or multi-ethnic origin

4. Circle the game you MOST prefer to play:

- j) Slots
- k) Electronic gambling machines
- l) Poker
- m) Black Jack
- n) Roulette
- o) Pro-line or sports betting
- p) Lottery
- q) Scratch Tickets
- r) Other (please specify) \_\_\_\_\_

5. Do you currently gamble? (circle one from 'a' to 'd' below)

- e) YES, I currently gamble
- f) NO, I quit or cut back significantly within the last 6 months
- g) NO, I quit or cut back significantly more than 6 months ago
- h) NO, I have never gambled

6. If you answered YES to question 6, how often do you gamble

- \_\_\_\_\_ More than once a day
- \_\_\_\_\_ More than once a week
- \_\_\_\_\_ More than once a month
- \_\_\_\_\_ More than once every 3 months

\_\_\_\_ Less than once every 3 months

7. How long have you gambled for? (Please answer in years, then months)

\_\_\_\_\_

8. Where do you typically gamble (e.g., home/internet, casino, etc.)?

\_\_\_\_\_

9. Have you currently or in the past received treatment for gambling related problems?

- e) YES, currently
- f) YES, in the past

NO.

10. Are you seriously thinking of quitting or cutting down on your gambling?

- g) YES, within the next 30 days
- h) YES, within the next 6 months

NO, not thinking of quitting or cutting down

11. I have a gambling problem.

YES            NO

**Appendix C: Problem Gambling Severity Index (PGSI)**

In the past 12 months how often ...

1. Have you bet more than you could really afford to lose?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

2. Have you needed to gamble with larger amounts of money to get the same feeling of excitement?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

3. Have you gone back another to try and win back the money you lost?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

4. Have you borrowed money or sold anything to get money to gamble?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

5. Have you felt that you might have a problem with gambling?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

6. Have you felt that gambling has caused you any health problems, including stress or anxiety?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

7. Have people criticized your betting or told you that you have a gambling problem, whether or not you thought it is true?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

- \* Please leave this item blank.

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

8. Have you felt your gambling has caused financial problems for you or your household?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

9. Have you felt guilty about the way you gamble or what happens when you gamble?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Never	Sometimes	Most of the time	Almost Always

**Appendix C: GMQ**

**Instructions:** Please answer the following statements in relation to your *reasons for gambling* by circling the appropriate response.

1. As a way to celebrate

1	2	3	4
Almost never/never	Sometimes	Often	Almost Always

2. To relax

1	2	3	4
Almost never/never	Sometimes	Often	Almost Always

3. Because you like the feeling

1	2	3	4
Almost never/never	Sometimes	Often	Almost Always

4. Because it's what most of your friends do when you get together

1	2	3	4
Almost never/never	Sometimes	Often	Almost Always

5. To forget your worries

1	2	3	4
Almost never/never	Sometimes	Often	Almost Always

6. Because it's exciting

1	2	3	4

Almost never/never	Sometimes	Often	Almost Always
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7. To be sociable

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

8. Because you feel more self-confident or sure of yourself

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

9. To get a 'high' feeling

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

10. Because it is something I do on special occasions

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

11. Because it helps when you are feeling nervous or depressed

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

12. Because it's fun

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
----------	----------	----------	----------

Almost never/never	Sometimes	Often	Almost Always
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13. Because it makes a social gathering more enjoyable

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

14. To cheer up when you're in a bad mood

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

15. Because it makes you feel good

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

### Appendix D: Continuity Manipulation

#### Research Shows Gambling Does *Not* Change The Inner You

Results of a series of comprehensive studies recently published in *New England Journal of Medicine* suggests that, despite heavy gambling having the potential to cause an array of negative consequences (e.g., financial, interpersonal problems), it does not change people's personalities and behaviors. That is, people's behaviors, moods and personalities remain the same despite heavy gambling.

Please take a moment to reflect and write below, **how** you have remained the same, that is, **how** you are the same person now despite engaging in gambling activities compared to before when you were not gambling.

## Appendix E: Discontinuity Manipulation

### Gambling Can Change Who You Are

Results of a series of comprehensive studies recently published in *New England Journal of Medicine* suggests that, along with the potential negative consequences associated with heavy gambling (e.g., financial, interpersonal problems), heavy gambling can also result in losing your sense of self. Recent findings suggest that in addition to an array of negative consequences, heavy gambling can cause profound changes to people's behavior, moods, attitudes and personality.

Please take a moment to reflect and write below, **how** gambling has changed your behaviors, moods, attitudes and sense of self. That is, **how** you are a different person now that you are gambling compared to the person you were before engaging in gambling activities.

**Appendix F: Validity Check**

Please select the item that best summarizes the research report.

1. Heavy gambling has been associated with fundamental changes to a person's personality.
2. Heavy gambling has no effect on person's personality, that is, they act in similar ways now as they did before they started gambling.
3. The study could not provide a definitive answer if problem gambling is associated with changes to person's personality.

**Appendix G: Measures****Self- Continuity**

Using the following scale, please indicate if you agree or disagree with the following statements. Please mark the answer of your choice to each question according to the following scale.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

____ 1. Gambling has changed who I am.
____ 2. When I think about who I am now, it is different from who I was before I started gambling.
____ 3. There is no difference between who I am now and who I was before I started gambling.
____ 4. The person I was before I started gambling is different from the person I am now.
____ 5. Please leave this item blank.

### Nostalgia Inventory Scale

Using the following scale, please indicate if you agree or disagree with the following statements. Please mark the answer of your choice to each question according to the following scale.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

___ 1. I sometimes feel nostalgic for the life I had before I started gambling.
___ 2. I never miss the life I had before I started gambling.
___ 3. I sometimes long for the life I had before gambling.
___ 4. Before I started gambling I was a better person than I am today.
___ 5. I am a better person now than I was before I started gambling.
___ 6. I like the person I was before I before I started gambling better than the person I am now.

### Readiness to Change Scale

Each rung on this ladder represents where various gamblers are in their thinking about changing their gambling behaviors.

Select the number that indicates where you are now. Please select only one number.

10 → Taking action to change (e.g., cutting down, enrolling in a program).

9

8 → Starting to think about how to change my gambling patterns.

7

6

5 → I think I should change but not quite ready.

4

3

2 → I think I need to consider changing someday.

1

0 → No thought of changing

2. Select a number that best describes your desire to change your gambling behavior at this time

No desire

Full desire

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

3. Select a number that best describes your expectation of success in changing your gambling behavior at this time

Lowest expectation of  
success

Highest expectation of  
success

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

4. Select a number that best describes how difficult you think it would be for you to change your gambling behavior and maintain the change at this time

Lowest amount of  
difficulty

Highest amount of  
difficulty

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

## **Appendix H: Debriefing**

This study has received clearance by the Carleton University Psychology Research Ethics Board (Reference #13-160)

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**Thank you for participating in this study!** This post-survey information is provided to inform you of the exact nature of the research you just participated in.

### **Compensation**

As the compensation for the study will given directly by MTurk, we do not require any personal or identifying information.

### **What are we trying to learn in this research?**

Past research has shown gambling can develop into an addiction, causing harm to an individuals well being. Despite the continued harms associated with persistent gambling, problem gamblers do not seem motivated to change their behavior. Circumstantial evidence suggests that perceptions of self-discontinuity (i.e., how different a problem gambler perceives their past self before gambling to their current self) may increase a gamblers readiness to change their gambling behaviors.

In this study we were interested in increasing problem gamblers readiness to change by increasing problem gamblers perceptions of self-discontinuity. Furthermore, we were interested in assessing if a sense of discontinuity might lead to a longing for their past self (nostalgia), thus leading to the desire to reclaim the past self via behavioral change. We achieved this by asking you to read a fake research report summarizing the effects of problem gambling on people's self-concept and were asked to reflect on how gambling has or has not changed your self-concept (e.g., behaviors, moods, attitude). You were randomly assigned to a self-continuity condition or a self-discontinuity condition. In the self-continuity condition, participants read a report stating that the past self before gambling and present self with gambling is very similar and were asked to reflect how they have remained the same despite engaging in gambling activities. In the self-discontinuity condition, participants read a fake report stating that the past self before gambling and present self with gambling is very different and were asked to reflect and state how gambling has changed their self-concept.

### **Why is this important to scientists or the general public?**

This research will contribute to our knowledge of readiness to change harmful gambling behaviors. More importantly, the data obtained in this study will be used to develop effective health initiatives that may lead a problem gambler to take action before the consequences of their gambling become severe.

### **What are our hypotheses and predictions?**

We predict that problem gamblers who feel a sense of self-discontinuity will be more ready to change their gambling behavior. Furthermore, we predict that this is due to the problem gamblers desire to reclaim the more favorable non-gambling past self via behavioral change.

**Is there anything I can do if I found this experiment to be emotionally upsetting?**

Yes, if you feel any distress or anxiety after participating in this study there are a number of agencies that offer confidential services for Problem Gambling. A list of helplines by town and state can be found at

<http://www.ncpgambling.org/i4a/pages/index.cfm?pageid=1>.

**Where can I get more resources on gambling research?**

If you are interested in additional resources for gambling related resources, The National Center for Responsible Gambling <http://www.ncrg.org/> has a wealth of current research, information and confidential services for gambling and problem gambling research.

Additional resources can be found at <http://www.rgrc.org/en>

**What if I have questions later?**

If you have any other questions or comments about this research, please feel free to contact Andrew (Hyouun) Kim ([hyoun.kim@carleton.ca](mailto:hyoun.kim@carleton.ca)) or Dr. Michael J. A. Wohl ([michael.wohl@carleton.ca](mailto:michael.wohl@carleton.ca)).

Should you have any ethical concerns about this research, please contact Dr. Shelley Brown, Chair, Carleton University Psychology Research Ethics Board at [Shelley.Brown@carleton.ca](mailto:Shelley.Brown@carleton.ca), (613) 520-2600 ext. 1505). For any other concerns, please contact, Dr. Anne Bowker (Chair, Department of Psychology, 1 (613) 520-2600, ext. 8218, [psychchair@carleton.ca](mailto:psychchair@carleton.ca)).

**Thank you for participating in this study!** We greatly appreciate your participation in the current study.

## STUDY 3 MATERIALS

### Appendix J: Recruitment Announcement:

#### Announcement for MTurk

##### Perceptions of Self-Continuity and Drinking Study (15mins/\$0.50)

Only people who are over the age of 21 and consume alcoholic drinks (e.g., beer, wine, liquor, mixed drinks, spirits, etc) are eligible for this study.

In this study you will be asked to answer a variety of questions about your drinking behaviors (preferred type of alcoholic drink, frequency of consuming alcoholic drinks). You will also be asked to read a brief report about the effects of drinking on self-perceptions as well you will be asked to reflect and state the effects that drinking has had on your self-concept based on recent research findings. In addition, you will be asked to complete several questionnaires assessing self-continuity (i.e., the feeling that the self is fundamentally the same despite physical and psychological changes) nostalgia and readiness to change your drinking behavior.

Your participation as well as your responses will be strictly confidential. Only researchers associated with the research project will know you participated in the study and no one will know how you responded to the questions asked. In addition, your responses will be anonymous and you will not be asked any identifying information.

We can anticipate no physical discomfort to you as a result of your participation in this study. You may, however, experience anxiety or distress when thinking about past or current drinking activities. In the event you feel anxiety or distress, information will be provided linking you to appropriate health services in your local area.

#### Eligibility Requirements:

1. Must be over the age of 21.
2. Resident of the United States of America.
3. Must be currently or in the past have consumed alcoholic drinks (e.g., beer, wine, liquor, mixed drinks, spirits, etc).

This study takes about 15 minutes, and upon completion you will receive US\$0.50 for your participation.

This study has received clearance by the Carleton University Psychology Research Ethics Board (Reference #13-160)

### Appendix K: Informed Consent Form

The purpose of an informed consent is to ensure that you understand the purpose of the study and the nature of your involvement. The informed consent must provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

This study has received clearance by the Carleton University Psychology Research Ethics Board (Reference #13-160)

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**Present study:** Perceptions of self-continuity and drinking.

**Research personnel:** Andrew (Hyoun) Kim (Principal Investigator, Hyoun.Kim@carleton.ca)

Dr. Michael J. A. Wohl (Faculty Investigator, (613) 520-2600, ext. 2908; Michael.Wohl@carleton.ca)

Should you have any ethical concerns about this research, please contact Dr. Shelley Brown, Chair, Carleton University Psychology Research Ethics Board at [Shelley.Brown@carleton.ca](mailto:Shelley.Brown@carleton.ca), (613) 520-2600 ext. 1505). For any other concerns, please contact, Dr. Anne Bowker (Chair, Department of Psychology, 1 (613) 520-2600, ext. 8218, [psychchair@carleton.ca](mailto:psychchair@carleton.ca)).

**Purpose and Task requirements:** The aim of this study is to assess a sense of self-continuity (i.e., the feeling that the self is fundamentally the same despite physical and psychological changes) and levels of nostalgia. As a participant, you will be asked to answer a variety of questions about your drinking behaviors (preferred type of alcoholic drink, frequency of consuming alcoholic drinks) and asked to read a brief report about the effects of drinking on self-perceptions (how a person thinks of the self). Furthermore, you will be asked to reflect and state the effects that drinking has had on your self-concept based on recent research findings. In addition, you will be asked to complete several questionnaires assessing self-continuity, nostalgia and readiness to change your drinking behavior.

Be assured that your name will not be associated in any way with the research findings. We are offering eligible participants who complete the study US \$0.50 for participating.

**Duration and locale:** The survey will be administered on-line and should take approximately 15 minutes to complete.

**Potential risk/discomfort:** We can anticipate no physical discomfort to you as a result of your participation in this study. You may, however, experience some stress when thinking about past or current drinking behaviors. If you do experience any distress or

discomfort, you may wish to contact one of the helplines nearest to your location. A number for a confidential helpline and available services in your region can be found at <http://www.allaboutcounseling.com/library/addiction-treatment/>. A copy of this information will be provided to you in the debriefing sheet following the questionnaires.

**Right to withdraw:** Your participation in this study is entirely voluntary. At any point during the study you have the right to not complete certain questions or to withdraw with no penalty whatsoever. To withdraw at any point, simply click the “withdrawal” button to reach the debriefing page.

**Anonymity/Confidentiality:** The data collected in this study are confidential. There will be no identifying information attached to your data. The coded data are made available only to the researchers associated with this project.

We collect data through the software Qualtrics, which uses servers with multiple layers of security to protect the privacy of the data (e.g., encrypted websites and pass-word protected storage). Please note that Qualtrics is hosted by a server located in the USA. The United States Patriot Act permits U.S. law enforcement officials, for the purpose of an anti-terrorism investigation, to seek a court order that allows access to the personal records of any person without that person's knowledge. In view of this we cannot absolutely guarantee the full confidentiality and anonymity of your data. With your consent to participate in this study you acknowledge this.

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By checking this box you agree to the following terms:

I have read the above form and understand the conditions of my participation. My participation in this study is voluntary, and if for any reason, at any time, I wish to leave the experiment I may do so without having to give an explanation and with no penalty whatsoever. Furthermore, I am also aware that my participation as well as the data gathered in this study is confidential. Checking the box below and clicking ‘Next’ indicates that I agree to participate in the study.

**Appendix L: Demographic Information***Background*

1. Age:
2. Gender (circle one): Male / Female
3. Ethnicity (circle #from a-h below):
  - a) Caucasian/European origin
  - b) African American
  - c) East Asian (Chinese, Japanese, Korean)
  - d) South Asian (Indian, Pakistani, Sri Lankan, etc.)
  - e) Middle Eastern
  - f) Native American
  - g) Hispanic and South American Origin
  - h) Other or multi-ethnic origin
4. Circle the alcoholic drink you MOST prefer to drink:
  - s) Beer
  - t) Wine
  - u) Spirits (e.g., rum, vodka, tequila, scotch, etc)
  - v) Mixed Drinks (e.g., rum and cokes)
  - w) Other (please specify) \_\_\_\_\_
5. Do you currently consume alcoholic drinks? (circle one from 'a' to 'd' below)
  - i) YES, I currently consume alcoholic drinks
  - j) NO, I quit or cut back significantly within the last 6 months
  - k) NO, I quit or cut back significantly more than 6 months ago
  - l) NO, I have never consumed alcoholic drinks
6. If you answered YES to question 6, how often do you consume alcoholic drinks?  
\_\_\_\_ More than once a day  
\_\_\_\_ More than once a week  
\_\_\_\_ More than once a month  
\_\_\_\_ More than once every 3 months  
\_\_\_\_ Less than once every 3 months

7. How long have you consumed alcoholic drinks for? (Please answer in years, then months) \_\_\_\_\_

8. Where do you typically consume alcoholic drinks (e.g., home, bars, etc.)?  
\_\_\_\_\_

9. Have you currently or in the past, received treatment for alcohol abuse related problems?

- i) YES, currently
- j) YES, in the past

NO.

10. Are you seriously thinking of quitting or cutting down on your drinking?

- k) YES, within the next 30 days
- l) YES, within the next 6 months

NO, not thinking of quitting or cutting down

11. I have a drinking problem.

YES                      NO

**Appendix L: AUDIT**

Please circle the answer that is correct for you

1. How often do you have a drink containing alcohol?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Never	Monthly or less	Two to four times a month	Two to three times a week	Four or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1 or 2	3 or 4	5 or 6	7 to 9	10 or more

3. How often do you have six or more drinks on one occasion?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

4. Have often during the last year have you found that you were not able to stop drinking once you had started?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
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?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
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

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
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?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Never	Less than monthly	Monthly	Weekly	Daily or

	monthly			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?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

\*

Please leave this item blank.

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

9. Have you or someone else been injured as result of your drinking?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
No		Yes, but not in the last year		Yes, during the last year

10. Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?

<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
No		Yes, but not in the last year		Yes, during the last year

**Appendix L: DMQ**

**Instructions:** Please answer the following statements in relation to your *reasons for drinking* by circling the appropriate response.

1. As a way to celebrate

1	2	3	4
Almost never/never	Sometimes	Often	Almost Always

2. To relax

1	2	3	4
Almost never/never	Sometimes	Often	Almost Always

3. Because you like the feeling

1	2	3	4
Almost never/never	Sometimes	Often	Almost Always

4. Because it's what most of your friends do when you get together

1	2	3	4
Almost never/never	Sometimes	Often	Almost Always

5. To forget your worries

1	2	3	4
Almost never/never	Sometimes	Often	Almost Always

6. Because it's exciting

1	2	3	4

Almost never/never	Sometimes	Often	Almost Always
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7. To be sociable

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

8. Because you feel more self-confident or sure of yourself

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

9. To get high

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

10. Because it is customary on special occasions

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

11. Because it helps when you are feeling nervous or depressed

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

12. Because it's fun

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
----------	----------	----------	----------

Almost never/never	Sometimes	Often	Almost Always
--------------------	-----------	-------	---------------

13. Because it makes a social gathering more enjoyable

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

14. To cheer up when you're in a bad mood

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

15. Because it makes you feel good

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Almost never/never	Sometimes	Often	Almost Always

### Appendix M: Continuity Manipulation

#### Research Shows Drinking Does *Not* Change The Inner You

Results of a series of comprehensive studies recently published in *New England Journal of Medicine* suggests that, despite frequent drinking having the potential to lead to negative consequences (e.g., physical health, interpersonal problems), people's personalities and behaviors remain the same despite frequent drinking.

Please take a moment to reflect and write below, **how** you have remained the same, that is, **how** you are the same person now despite drinking compared to the person before when you were not drinking.

## Appendix N: Discontinuity Manipulation

### Drinking Can Change Who You Are

Results of a series of comprehensive studies recently published in *New England Journal of Medicine* suggests that, along with the potential negative consequences associated with frequent drinking (e.g., physical health problems, interpersonal problems), drinking can also result in losing your sense of self. The major findings in the studies suggest that frequent drinking can cause profound changes to people's behavior, moods, attitudes and personality.

Please take a moment to reflect and write below, **how** drinking has changed your behaviours, moods, attitudes and sense of self. That is, **how** you are a different person now compared to the person you were before drinking.

**APPENDIX O: Control Condition**

Please take a moment and tell us about a typical day in your life

**Appendix P: Validity Check**

Please select the item that best summarizes the research report.

1. Heavy drinking has been associated with fundamental changes to a person's personality.
2. Heavy drinking has no effect on person's personality, that is, they act in similar ways now as they did before they started drinking.
3. The study could not provide a definitive answer if problem drinking is associated with changes to a person's personality.

**Appendix Q: Measures****Self- Continuity**

Using the following scale, please indicate if you agree or disagree with the following statements. Please mark the answer of your choice to each question according to the following scale.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

____ 1. Drinking has changed who I am.
____ 2. When I think about who I am now, it is different from who I was before I started drinking.
____ 3. There is no difference between who I am now and who I was before I started drinking.
____ 4. The person I was before I started drinking is different from the person I am now.
____ 5. Please leave this item blank.

### Nostalgia Inventory Scale

Using the following scale, please indicate if you agree or disagree with the following statements. Please mark the answer of your choice to each question according to the following scale.

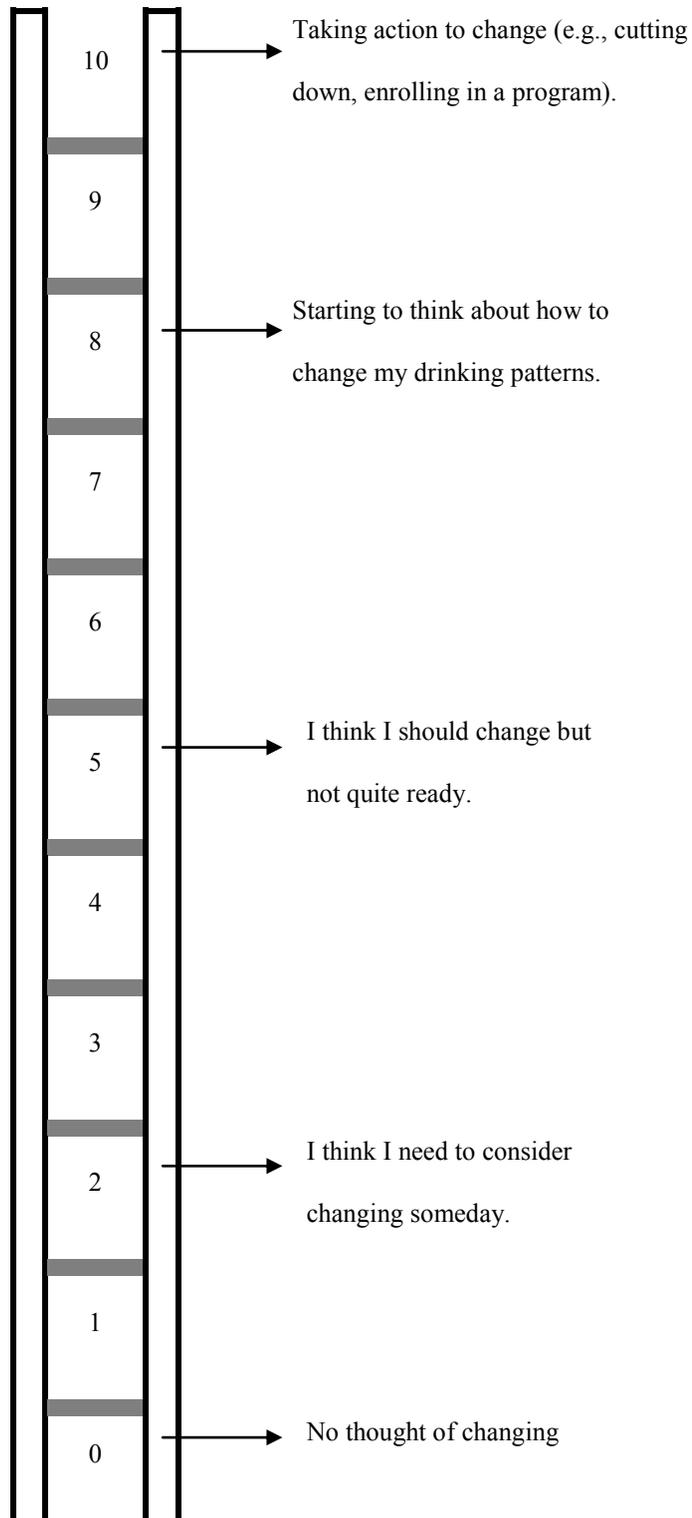
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Somewhat Disagree</b>	<b>Neither Agree or Disagree</b>	<b>Somewhat Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

___ 1. I sometimes feel nostalgic for the life I had before I started drinking.
___ 2. I never miss the life I had before I started drinking.
___ 3. I sometimes long for the life I had before drinking.
___ 4. Before I started drinking I was a better person than I am today.
___ 5. I am a better person now than I was before I started drinking.
___ 6. I like the person I was before I started drinking better than the person I am now.

### Readiness to Change Scale

Each rung on this ladder represents where various drinkers are in their thinking about changing their drinking behaviors.

Select the number that indicates where you are now. Please select only one number.



2. Select a number that best describes your desire to change your drinking behavior at this time

No desire

Full desire

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

3. Select a number that best describes your expectation of success in changing your drinking behavior at this time

Lowest expectation of  
success

Highest expectation of  
success

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

4. Select a number that best describes how difficult you think it would be for you to change your drinking behavior and maintain the change at this time

Lowest amount of  
difficulty

Highest amount of  
difficulty

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

## **Appendix R: Debriefing**

This study has received clearance by the Carleton University Psychology Research Ethics Board (Reference #13-160)

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**Thank you for participating in this study!** This post-survey information is provided to inform you of the exact nature of the research you just participated in.

### **Compensation**

As the compensation for the study will be given directly by MTurk, we do not require any personal or identifying information.

### **What are we trying to learn in this research?**

Past research has shown drinking alcohol can develop into an addiction, causing harm to an individual's well-being. Despite the continued harms associated with persistent alcohol use, problem drinkers do not seem motivated to change their behavior. Circumstantial evidence suggests that perceptions of self-discontinuity (i.e., how different a problem drinker perceives their past self before drinking to their current self) may increase readiness to change their drinking behaviors.

In this study we were interested in increasing problem drinkers' readiness to change by increasing a problem drinker's perceptions of self-discontinuity. Furthermore, we were interested in assessing if a sense of discontinuity might create a longing for the past non-drinking self (nostalgia), thus leading to the desire to reclaim the past self via behavioral change. We achieved this by asking you to read a fake research report summarizing the effects of drinking on people's self-concept and were asked to reflect on how drinking has or has not changed your self-concept (e.g., behaviors, moods, attitude). You were randomly assigned to a self-continuity condition or a self-discontinuity condition. In the self-continuity condition, participants read a report stating that the past self before drinking and present self with drinking is very similar and asked to reflect and state how they were very similar. In the self-discontinuity condition, participants read a fake report stating that the past self before drinking and present self with drinking is very different and asked to reflect and state how they were very different.

### **Why is this important to scientists or the general public?**

This research will contribute to our knowledge of readiness to change harmful drinking behaviors. More importantly, the data obtained in this study will be used to develop effective health initiatives that may lead a problem drinker to take action before the consequences of their drinking become severe.

### **What are our hypotheses and predictions?**

We predict that problem drinkers who feel a sense of self-discontinuity will be more ready to change their drinking behavior. Furthermore, we predict that this is due to the

problem drinkers desire to reclaim the more favorable non-drinking past self via behavioral change.

**Is there anything I can do if I found this experiment to be emotionally upsetting?**

Yes, if you feel any distress or anxiety after participating in this study there are a number of agencies that offer confidential services for Alcohol Abuse. A number for a confidential helpline and available services in your region can be found at <http://www.allaboutcounseling.com/library/addiction-treatment/>.

**Where can I get more resources on alcohol abuse research?**

If you are interested in additional resources for alcohol abuse related resources, National Institute on Alcohol Abuse and Alcoholism <http://www.niaaa.nih.gov/> has a wealth of current research and information for alcohol abuse research. Furthermore, if you desire to seek help for your alcohol use, a number for a confidential helpline and available services in your region can be found at <http://www.allaboutcounseling.com/library/addiction-treatment/>.

**What if I have questions later?**

If you have any other questions or comments about this research, please feel free to contact Andrew (Hyouun) Kim ([hyoun.kim@carleton.ca](mailto:hyoun.kim@carleton.ca)) or Dr. Michael J. A. Wohl ([michael.wohl@carleton.ca](mailto:michael.wohl@carleton.ca)).

Should you have any ethical concerns about this research, please contact Dr. Shelley Brown, Chair, Carleton University Psychology Research Ethics Board at [Shelley.Brown@carleton.ca](mailto:Shelley.Brown@carleton.ca), (613) 520-2600 ext. 1505). For any other concerns, please contact, Dr. Anne Bowker (Chair, Department of Psychology, 1 (613) 520-2600, ext. 8218, [psychchair@carleton.ca](mailto:psychchair@carleton.ca)).

**Thank you for participating in this study!** We greatly appreciate your participation in the current study.