

Me, Myself, and Money II: Relative Deprivation Predicts Disordered Gambling Severity via Delay Discounting, Especially Among Gamblers Who Have a Financially Focused Self-Concept

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Abstract In the current research, we examined whether the known link between relative deprivation and disordered gambling (via delay discounting; i.e., preferences for immediate smaller rewards relative to delayed larger rewards) is moderated by the extent to which gamblers have a financially focused self-concept. Specifically, we hypothesized that delay discounting would be a strong predictor of disordered gambling among those who base their self-worth on their financial success. To test this moderated-mediation model, a community sample of gamblers ($N = 239$) completed measures that assessed relative deprivation, delay discounting, financially focused self-concept, and disordered gambling severity. As predicted, people who felt more relative deprivation reported more severe symptoms of disordered gambling and this association was mediated by delay discounting. Importantly, this mediated relationship was moderated by the extent to which participants' self-concept was focused on financial success. Among participants whose self-concept was high in financial focus, greater delay discounting (stemming from relative deprivation) was a strong predictor of disordered gambling. Among people whose self-concept was low in financial focus, delay discounting (stemming from relative deprivation) was a weak predictor of disordered gambling. Thus, the magnitude of the indirect effect of relative deprivation on disordered gambling severity was larger among people with a more financially focused self-concept—an effect mediated by delay discounting. These findings suggest that targeting gamblers' financial focus in prevention and treatment interventions may be instrumental in curtailing the development and maintenance of disordered gambling.

Keywords Delay discounting · Disordered gambling · Money · Relative deprivation · Self-concept

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Introduction

People often compare the resources (e.g., money) in their possession to similar others. Problems arise when people feel unfairly deprived of those resources relative to similar others (Crosby 1976). Indeed, relative deprivation has been associated with feelings of anger and resentment, which—at the extreme—can yield decrements in mental and physical health (Callan et al. 2015; Mishra and Carleton 2015; for a meta-analytic review, see Smith et al. 2012). One route by which feelings of relative deprivation can yield negative health outcomes is via increased gambling. Specifically, research has shown that gamblers who feel relatively deprived report higher urges to gamble (Callan et al. 2008; Haisley et al. 2008) as well as more severe symptoms of disordered gambling (Mishra and Novakowski 2016; Tabri et al. 2015, in press). The reason for the association between relative deprivation and gambling is that people who feel relatively deprived develop a preference for immediate smaller rewards relative to delayed larger rewards (i.e., they delay discount; Callan et al. 2011). That is, gamblers who feel relatively deprived delay discount in order to address the perceived resource imbalance with immediate financial reward.

In the current research, we tested the idea that the indirect effect of relative deprivation on gambling via delay discounting is contingent on the extent to which gamblers have a financially focused self-concept (Tabri et al. 2016). People whose self-concept is focused on financial success are highly motivated to increase the amount of money in their possession to enhance their sense of self-worth. Importantly, in this light, there is likely to be an especially strong link between delay discounting (stemming from relative deprivation) and problematic gambling among gamblers who are financially focused. This is because the financially focused gambler is apt to direct their feelings of relative deprivation toward gambling—a quick, non-traditional means to advance their financial position (see Tabri et al. 2015), which should manifest (with time) as gambling problems. We tested this heretofore unexamined idea in a sample of community gamblers.

Relative Deprivation, Delay Discounting, and Disordered Gambling

Relative deprivation refers to the perception that one is unjustly resource disadvantaged relative to others, accompanied by feelings of anger and resentment (Crosby 1976; Smith et al. 2012). When people feel unfairly deprived they become motivated to eliminate their perceived resource disadvantage. For example, prior research has shown that people who feel relatively deprived are more likely to seek out better work opportunities (Hafer and Olson 1993; Olson et al. 1995), engage in professional development activities (Zoogah 2010), and “moonlight” (Wilensky 1963) in an attempt to improve their financial position. While such strategies to enhance one’s financial position are adaptive, people may also engage in maladaptive strategies that are unproductive or even harmful. Indeed, people who feel relatively deprived are also more apt to look to gambling as a (non-traditional) means to enhance their financial position quickly (Callan et al. 2008; 2015; Haisley et al. 2008). Importantly, people who feel relatively deprived are not only more likely to turn to gambling than those who do not have such feelings, they are also more likely to develop gambling problems (Callan et al. 2008; Mishra and Novakowski 2016; Tabri et al. 2015).

To date, a paucity of research has assessed the process by which relative deprivation leads to gambling problems. One explanation that has received empirical support is that the desire for immediate smaller rewards relative to delayed larger rewards (i.e., they delay

discount) mediates the link between relative deprivation and gambling problems (see Callan et al. 2011). Put another way, gamblers who feel relatively deprived want to rectify their perceived resource imbalance posthaste. To do so, they are apt to want immediate small rewards compared to larger rewards that may occur down the road. Unfortunately, delay discounting is a strong predictor of gambling problems (Alessi and Petry 2003; Canale et al. 2015; Ciccarelli et al. 2016; Cosenza et al. in press; Dixon et al. 2003; Mishra and Novakowski 2016; Petry 2001). This is because people who discount future rewards have a tendency to engage in impulsive behaviors that offer immediate gratification (such as gambling).

The extant literature, however, has failed to explain when (or for whom) delay discounting leads to problematic gambling. Herein, we hypothesized that the effect of delay discounting on problematic gambling behavior is most likely to manifest among gamblers who derive their sense of self-worth from their perceived financial success. Specifically, we hypothesized that the link between delay discounting and disordered gambling is strongest when the gambler possesses a financially focused self-concept.

The Moderating Role of Financially Focused Self-Concept

Most people evaluate their self-worth based on their perceived performance in various life domains (e.g., financial success, interpersonal relationships, and physical health; Crocker and Wolfe 2001; Rosenberg 1979). As well, people are motivated to bolster their self-worth in domains on which their self-worth is staked (Crocker and Knight 2005; Crocker and Park 2004). However, people who are singularly focused on a specific life domain invest the majority of their time and effort at excelling in the focused domain (Veale 2002). The reason is that such people view the focused domain as a core aspect of the self and attach greater importance to the focused domain as a source of self-worth. Applied to the context of gambling, Tabri et al. (2016) showed that people whose self-concept is more focused on financial success attached greater importance to the money they have in their possession as a source of self-worth relative to other life domains. Critically, such people were also more likely to have gambling problems because of their greater motivation to gamble for financial gain.

We contend that the effect of delay discounting (by way of relative deprivation) on disordered gambling may be contingent on the extent to which people have a financially focused self-concept. That is, relative deprivation increases the desire for immediate rewards, but this increased desire in turn affects gambling differently for people whose self-concept is highly focused on financial success compared to people whose self-concept is less focused on financial success. The rationale is based on theory and research suggesting that people's attitudes, preferences, and behaviors are guided by the content of their self-concept (Markus and Wurf 1987; Wheeler et al. 2007). Among gamblers whose self-concept is highly focused on financial success, we posit that delay discounting would strongly predict disordered gambling. The reason is that gamblers with a more financially focused self-concept are highly motivated to increase the amount of money they have in their possession (Tabri et al. 2016)—a known factor implicated in the transition from recreational to disordered gambling (e.g., Clarke et al. 2006). However, among gamblers whose self-concept is less focused on financial success, delay discounting may also predict disordered gambling, but to a much weaker extent. The reason is that such people are less likely to gamble for financial gain and thus be less likely to develop gambling problems.

Accordingly, we hypothesized that gamblers who feel relatively deprived may indirectly develop gambling problems via delay discounting, but the magnitude of this indirect effect is larger among people with a more financially focused self-concept.

Overview of the Current Research

The purpose of the current research was to assess a possible boundary condition for the known indirect effect of relative deprivation on disordered gambling (via delay discounting). We hypothesized that this indirect effect would be larger among people with a more financially focused self-concept. To examine this hypothesis, we tested a moderated mediation model (see Fig. 1) with a community sample of frequent gamblers. In this model, relative deprivation predicts disordered gambling severity via delay discounting. The model takes into account that this indirect relationship is posited to be conditional on having a financially focused self-concept.

Method

Participants

A total of 274 community gamblers residing in the U.S. participated in the current research. The data of 35 participants were excluded because they either failed one or more attention checks ($n = 27$), had missing data on one or more questionnaires examined in the present research ($n = 4$), had less than a .75 consistency rate on the monetary choice questionnaire (Kibry et al. 1999; $n = 3$), or withdrew from the study ($n = 1$). Thus, the data of 239 participants (132 men and 106 women; one did not report gender information) were included in the analyses. Participants ranged in age from 19 to 80 years ($M = 36.71$, $SD = 11.28$).

Compliance with Ethical Standards

The research protocol was reviewed and cleared by the lead author's institutional research ethics board. As such, all participants provided informed consent prior to completing the survey. The authors declare they have no conflict of interest. With that said, to dedicate

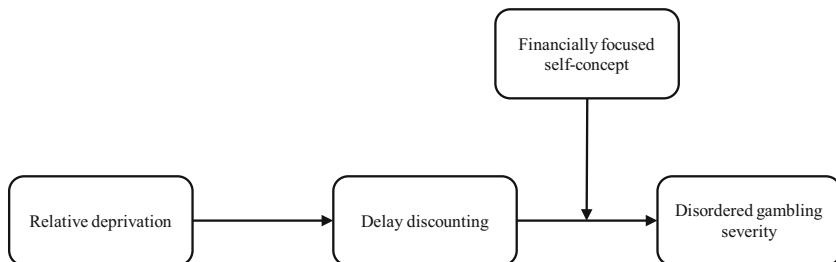


Fig. 1 Moderated mediation model with relative deprivation as the independent variable, delay discounting as the mediator variable, financially focused self-concept as the moderator variable, and disordered gambling severity as the dependent variable

time to this research project, the first author received funding from Fonds de Recherche du Québec sur la Société et la Culture and the last author received funding from the Ontario Problem Gambling Research Centre. Moreover, for the sake of transparency, the last author has served as a consultant for the gambling industry. However, the gambling industry was not consulted about the current project.

Procedure

Participants were recruited via Amazon.com's Mechanical Turk (MTurk)—a crowdsourcing Internet-based marketplace increasingly used by social scientists as a place to recruit people to complete short online surveys or experiments. Importantly, MTurk has been shown to produce valid and reliable data when assessing an array of addictive behaviors, including gambling, drinking, and cannabis use (see Kim and Hodgins 2016; also see Chandler and Shapiro 2016). As in Tabri et al. (2015), participants responded to a recruitment notice on MTurk that indicated we were seeking people who engaged in at least one form of gambling (e.g., poker, blackjack, roulette, slot machines, and sports betting) and who had spent at least \$100 on their gambling activities in the last 12 months.

After providing informed consent, participants completed the following questionnaires:

Relative deprivation Perceptions of relative deprivation was assessed using Callan et al. (2008) 4-item Personal Relative Deprivation questionnaire. Items were “When I think about what I have compared to others, I feel deprived,” “I feel privileged compared to other people like me” (reverse coded), “I feel resentful when I see how prosperous other people seem to be,” and “When I compare what I have with others, I realize that I am quite well off” (reverse coded). Participants' responses to the items were anchored at 1 (*strongly disagree*) and 7 (*strongly agree*). Responses were averaged such that higher scores indicated greater personal relative deprivation ($\alpha = .78$).

Delay discounting The extent to which participants delay discount was assessed using Kibry et al. (1999) monetary choice questionnaire. This questionnaire consists of 27 hypothetical two-option choices between an immediate small reward and a delayed larger reward (e.g., “Would you prefer \$69 today or \$85 in 91 days' time?”). In line with recommendations by Myerson et al. (2014), we calculated the proportion of preferences for immediate smaller rewards relative to delayed larger rewards by summing the total number of responses favoring immediate smaller rewards and dividing this number by the total number of questions. Thus, scores ranged from 0 to 1 with higher numbers indicating a greater preference for immediate smaller rewards relative to delayed larger rewards.

Financially focused self-concept To assess the extent to which participants' self-concept is based on financial success we used the Financially Focused Self-Concept (FFS) questionnaire (Tabri et al. 2016). The FFS consists of 20 items equally distributed across four domains that assess agreement with beliefs about the perceived importance of money for self-views (e.g., “Money is a large part of who I am”), feelings (e.g., “My ability to feel happy depends on the amount of money I have”), interpersonal relationships (e.g., “The opinion others have of me is based on the amount of money I have”), and achievements (e.g., “The amount of success I have in my (future) job or career depends largely upon the amount of money I have”). Participants' responses to the FFS items were anchored at 0 (*not at all*) and 4 (*extremely*). Responses were averaged such that higher scores indicated greater financially focused self-concept ($\alpha = .95$).

Disordered gambling severity The Problem Gambling Severity Index (PGSI; Ferris and Wynne 2001) was used to measure disordered gambling severity. The PGSI includes nine items that measure the extent of problem gambling behaviors (e.g., “Have you gone back another day to try and win back the money you lost?”) and the consequences of engaging in problem gambling behaviors (e.g., “Has your gambling caused any financial problems for you or your household?”). Participants responded by indicating how frequently they engaged in problem gambling behaviors and experienced consequences due to their gambling behavior over the last 12 months. Responses were anchored at 0 (*never*) and 3 (*almost always*). The responses were summed (total possible score of 0–27) such that higher scores indicated greater disordered gambling severity ($\alpha = .91$).

After completing the questionnaire battery, participants were fully debriefed and compensated US \$.50 for their time, which is a typical remuneration for research of this kind on MTurk (Buhrmester et al. 2011).

Statistical Analysis

To test our proposed moderated mediation model (see Fig. 1), we used SPSS and the PROCESS macro (Model 14) developed by Hayes (2013) to estimate all parameters. Conditional indirect effects were examined at high (1 *SD* above the mean) and low (1 *SD* below the mean) values of financially focused self-concept using 95% bias-corrected bootstrapped confidence intervals (with 5000 resamples). Additionally, the overall statistical significance of moderated- mediation was evaluated using the Index of Moderated Mediation (Hayes 2015). All variables were mean-centered except for relative deprivation and the PGSI. As such, parameter estimates are unstandardized.

Results¹

Descriptive statistics and correlations between all variables are reported in Table 1.

Moderated Mediation Analysis

We conducted a moderated mediation analysis to examine our hypothesis that relative deprivation fosters disordered gambling symptoms (as measured by the PGSI) indirectly via delay discounting. We also hypothesized that delay discounting predicts disordered gambling symptoms among people who have a financially focused self-concept. That is, delay discounting stemming from relative deprivation fosters disordered gambling symptoms, especially among people who have a financial focused self-concept.

In line with expectations, relative deprivation predicted greater delay discounting, $B = .04$, $t = 4.04$, $p < .001$, 95% CI [.02, .06], but not disordered gambling severity, $B = .16$, $t = .61$, $p = .52$, 95% CI [−.67, .34]. Disordered gambling severity was also predicted by both greater delay discounting and the FFS, $B = 6.63$ $t = 5.01$, $p < .001$, 95% CI [4.03, 9.24] and $B = 2.54$ $t = 7.09$ $p < .001$, 95% CI [1.83, 3.25], respectively. Importantly, the two-way interaction between delay discounting and FFS qualified the

¹ We included the PGSI as a continuous dependent variable in our analyses because including the PGSI as an ordered categorical dependent variable violated the proportional odds assumption of ordinal logistic regression. That is, the regression coefficients were not the same across response categories of the ordered categorical PGSI.

Table 1 Descriptive statistics and correlations between all variables

Variable	<i>M (SD)</i>	1	2	3	4
1. Relative deprivation	3.66 (1.29)	–			
2. Delay discounting	.54 (.20)	.25**	–		
3. FFS	1.99 (.90)	.56**	.12 [†]	–	
4. PGSI	4.47 (4.95)	.29**	.31**	.48**	–

N = 239

FFS Financially Focused Self-Concept, *PGSI* Problem Gambling Severity Index

[†] *p* = .05; * *p* < .05; ** *p* < .01

main effects, $B = 3.95$, $t = 2.85$, $p = .004$, 95% CI [1.22, 6.68]. There was a statistically significant indirect effect of relative deprivation on disordered gambling severity via greater delay discounting at 1 *SD* above the mean of the FFS, *indirect effect* = .42, 95% CI [.15, .81]. At 1 *SD* below the mean of the FFS, the conditional indirect effect was also observed, but the magnitude of this effect was much smaller, *indirect effect* = .12, 95% CI [.03, .29]. Notably, the Index of Moderated Mediation was statistically significant, $B = .16$, 95% CI [.03, .36], which confirmed that the indirect effect of relative deprivation on disordered gambling severity via delay discounting varies as a function of FFS.

Discussion

A growing body of research suggests that people who feel relatively deprived also have more severe gambling problems (Callan et al. 2008; Haisley et al. 2008; Mishra and Novakowski 2016; Tabri et al. 2015). This is because relative deprivation impels gambling behavior driven by the desire for immediate smaller rewards relative to delayed larger rewards. Indeed, Callan et al. (2011) showed that the relationship between relative deprivation and gambling problems is mediated by the extent to which gamblers delay discount. Importantly, however, little or no research has examined whether this mediated relationship is more harmful for some gamblers relative to others. The current research addressed this gap in the literature.

We hypothesized and found support for the idea that relative deprivation leads to gambling problems via delay discounting, especially among gamblers whose self-concept is focused on financial success. The reason is that financially focused gamblers are highly motivated to increase the money they have in their possession to enhance their self- and financial worth (Tabri et al. 2016). Among gamblers who were less financially focused, we observed a similar relationship, but to a much weaker extent. Thus, the current research extends the findings of Callan et al. (2011) by suggesting that the indirect influence of relative deprivation on disordered gambling via delay discounting may be particularly pernicious for financially focused gamblers.

The current research also contributes knowledge to a large body of research examining the relationship between delay discounting and disordered gambling severity. To our knowledge, little or no research has examined factors that moderate this relationship. In contrast, most prior gambling research has focused either on explaining variation in delay discounting (e.g., Andrade et al. 2014) or on delay discounting as a mediating mechanism (Callan et al. 2011; Canale et al. 2015). Importantly, however, findings from a recent meta-

analysis indicate that the mean effect size for the association between delay discounting and disordered gambling is small but heterogeneous (Amlung et al. 2016). This suggests that the magnitude of the relationship between delay discounting and disordered gambling severity may vary as a function of other factors. Accordingly, the current research contributes to this body of work by demonstrating that the effect of delay discounting (by way of relative deprivation) on disordered gambling severity varies as a function of the extent to which gamblers have a financially focused self-concept.

Practical Implications for Treatment Interventions

The findings of the current research may help inform the design of gambling treatment interventions. Previous research by Callan et al. (2011) suggests that strategies aimed at reducing gamblers' relative deprivation and delay intolerance of rewards may help alleviate disordered gambling. The current research extends this view by suggesting that such strategies may be more effective for gamblers who are less financially focused relative to gamblers who are more financially focused. For gamblers who are more financially focused, reducing their financial focus in conjunction with reducing relative deprivation and delay intolerance may be instrumental in helping to alleviate disordered gambling.

Although no treatment presently exists that addresses having a financially focused self-concept, Tabri et al. (2016) suggested that adapting strategies from the cognitive behavioral therapy of eating disorders aimed at alleviating an appearance focused self-concept (see Fairburn 2008) may be instrumental in addressing gamblers' financial focus. For example, health care providers could assist financially focused gamblers to lower the importance they attach to financial success as a source of their self-worth. At the same time, health care providers can help financially focused gamblers increase the domains from which they can derive a sense of self-worth, such as interpersonal relationships, physical health, and vocational activities.

Caveats

The current research is somewhat limited due to its correlational design. Thus, causal relations from the data can only be indirectly inferred. Nevertheless, previous experimental research indicates that inducing relative deprivation increases gambling urges (Callan et al. 2008; Haisely et al. 2008) and gambling behavior driven by a preference for immediate financial reward (Callan et al. 2011). Accordingly, future experimental research can attempt to replicate and extend our findings by examining whether the gambling consequences of inducing relative deprivation are contingent on the extent to which gamblers have a financially focused self-concept.

Another possible limitation concerns the external validity of our findings. We recruited a community sample of gamblers from MTurk, which may limit the generalizability of our findings. However, MTurk samples are more demographically diverse relative to traditional university samples (Buhrmester et al. 2011). In addition, research indicates that MTurk is a good source of data that is both reliable and valid (Buhrmester et al. 2011; Chandler and Shapiro 2016; Kim and Hodgins 2016). That said, we believe future research should examine whether our findings can be replicated with a more representative sample of community gamblers and with more exclusive samples of disordered gamblers and people who are at risk for disordered gambling.

Moreover, although the current research showed that delay discounting mediates the relationship between relative deprivation and disordered gambling among financially

focused gamblers, other mediating mechanisms not considered in the current research may be operating similarly and simultaneously. One such mediator is the extent to which people are motivated to gamble as a means of coping with negative affect (Stewart and Zack 2008). This motive is a well-established predictor of disordered gambling (e.g., MacLaren et al. 2015) that may be especially harmful for financially focused gamblers (see Tabri et al. 2016). Critically, because relative deprivation is a form of negative affect, perhaps gambling to cope with negative affect may mediate the relationship between relative deprivation and disordered gambling among financially focused gamblers. Future research can examine this possibility.

Concluding Comments

Theory and research suggests that relative deprivation fosters disordered gambling because it impels gambling behavior driven by a preference for immediate financial reward. In the current research, we examined whether the extent to which gamblers' self-concept is focused on financial success may qualify this relationship. We found that relative deprivation predicted disordered gambling via delay discounting especially among gamblers with a stronger financial focus. The findings extend theory and prior research by elaborating on how relative deprivation, delay discounting, and financially focused self-concept may work together to foster disordered gambling.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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