



Short Communication

A short-term longitudinal examination of the associations between self-control, delay of gratification and temporal considerations☆

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ABSTRACT

Greater ability to control ourselves, delay gratification and consider immediate and future consequences of our behaviors have been linked theoretically and empirically, yet evidence of their longitudinal relations is lacking. A sample of 345 undergraduate students completed a self-report survey twice within a five-month interval. Results from autoregressive cross-lagged analysis showed a bidirectional relation between self-control and delay of gratification, with self-control predicting change in delay of gratification and vice-versa, and these constructs differentially predicted change in temporal considerations. Self-control predicted change in consideration of *immediate* consequences, while delay of gratification predicted change in consideration of *future* consequences. These constructs are central to decision-making and successful human development, and the present study shows them to be temporally linked. Further longitudinal research is needed to examine the nature of their associations across long-term time frames.

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1. Introduction

What lies in our power to do, it lies in our power not to do.
[—Aristotle.]

The extant literature has provided theoretical and empirical evidence for associations between a greater ability to control ourselves, delay gratification and consider immediate and future consequences of our behaviors (e.g., Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008; Milfont & Schwarzenhal, 2014; Stolarski, Ledzińska, & Matthews, 2013; Zimbardo & Boyd, 1999). Yet research investigating the nature of the simultaneous associations between self-control, delay of gratification and temporal considerations is lacking. The present research uses panel data to examine the short-term longitudinal relations between these constructs with an autoregressive cross-lagged model.

Self-control is our capacity for altering or overriding our own responses to bring them in line with social and moral standards and to reach future goals, and is the conscious and deliberate part of self-

regulation (Baumeister, Vohs, & Tice, 2007). Poor self-control in childhood has been found to predict dire consequences in adulthood such as substance dependence, criminal convictions, and poor mental and physical health, all of which lead to excess societal costs in terms of health care, financial dependence, and crime (Moffitt et al., 2011). Being able to delay gratification refers to one's preference for larger and more delayed rewards over smaller rewards that are more immediately available (Mischel, 1996). In the classic delay of gratification task, children were given the choice to eat a small amount of a treat of their choice now, or to wait 15 min without giving in and receive a second treat (Mischel, Ebbesen, & Zeiss, 1972).

Although originally designed to assess when the ability to delay gratification developed in children, performance on the delay-of-gratification task was found to predict success many years later (Shoda, Mischel, & Peake, 1990), and effortful self-control was recently found to be the mechanism underlying this ability to delay gratification (Duckworth, Tsukayama, & Kirby, 2013). A well-known phenomenon increasing the difficulty of effortful control over one's impulses is temporal discounting, or the tendency to subjectively discount the value of a reward or goal as the time delay between the present and an expected reward or goal increases (Mischel, 1996; Mischel & Ayduk, 2011). The delayed reward decreases in value as the length of the delay interval increases, and so too does the individual's motivation to choose the delayed reward over immediate gratification.

As delay of gratification tasks measure the pursuit of future goals and a dilemma involving a choice between getting less now versus more later, it has been theoretically linked to individuals' consideration of

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the future consequences of their actions (e.g., Joireman et al., 2008; Stolarski et al., 2013). Supporting this link, studies have shown measures of future considerations to correlate with lower levels of impulsivity and a greater ability to delay immediate gratification (e.g., Joireman, Anderson, & Strathman, 2003; Joireman et al., 2008; Strathman, Gleicher, Boninger, & Edwards, 1994; Zimbardo & Boyd, 1999), and with the ability to delay gratification in an academic setting (Bembenutty & Karabenick, 2004). Yet only recently have self-control, delay of gratification and consideration of future consequences been empirically and simultaneously linked, with findings showing moderate positive correlations between all three constructs (Milfont & Schwarzenthal, 2014).

Using a panel dataset we examine the longitudinal relations between self-control, delay of gratification and the extent to which individuals consider the potential immediate and future outcomes of their behavior (Joireman, Shaffer, Balliet, & Strathman, 2012). Following on from previous literature, we expected self-control and delay of gratification to be temporally related (e.g., Duckworth et al., 2013). Importantly, we expected that self-control and delay of gratification would predict change in temporal considerations but not the other way round.

2. Method

2.1. Participants

We analyzed online survey data from first-year psychology students who completed the measures at each time point as part of mass-testing sessions in exchange for partial course credit. The final sample comprised all 345 students who completed both mass testing sessions at the beginning of the semesters (March and July, 2014) for the introduction-to-psychology courses. The majority were female (78.6%), New Zealand European (80.3%) and born in New Zealand (76.2%), with ages ranging between 17 and 39 years ($M = 18.65$, $SD = 2.18$).

3. Measures

3.1. Self-control

Participants' self-control was measured using the 13-item Brief Self-Control Scale (BSCS; Tangney, Baumeister, & Boone, 2004). Examples of items include "I am good at resisting temptation", and "I wish I had more self-discipline", rated on a scale from 1 (*not at all like me*) to 5 (*very much like me*).

3.2. Delay of gratification

Participants' inclination to favor long-term rewards over short-term, immediate satisfaction was measured using the 10-item short-form version of the Delaying Gratification Inventory (DGI-10; Hoerger, Quirk, & Weed, 2011). Examples of items include "I would have a hard time sticking with a special, healthy diet" and "I cannot be trusted with money", rated on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

3.3. Consideration of immediate/future consequences

The new 14-item version of the Consideration of Future Consequences scale distinguishes two dimensions: concern for *future* consequences (e.g., CFC-Future: "I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes"), and concern for *immediate* consequences (e.g., CFC-Immediate: "My convenience is a big factor in the decisions I make or the actions I take") (Joireman et al., 2012). Items were rated on a scale from 1 (*very uncharacteristic of me*) to 7 (*very characteristic of me*).

3.3.1. Data analysis

The effects of self-control and delay of gratification at Time 1 on consideration of immediate and future consequences at Time 2 were examined using an autoregressive cross-lagged model. The model calculates the longitudinal influences of one construct on another (and viceversa), while controlling for the stability of each construct over time, the concurrent associations between constructs at Time 1, and the disturbances (or residual associations) between measures at Time 2. We also calculated univariate Wald tests of parameter constraint to assess whether the size of a given path differed significantly from another relevant path. These analyses were computed in Mplus (version 7.3).

4. Results

The Supplementary material presents the full measures along with descriptive statistics, additional results, and results from confirmatory factor analysis for the measures. Fig. 1 presents the abbreviated autoregressive cross-lagged model with statistically significant paths. Starting with the autoregressive paths, the results show all variables to be relatively stable over time. The autoregressive paths for BSCS and DGI-10 were similar in size ($\chi^2(1) = 0.34$, $p = 0.56$), as were the autoregressive paths for CFC-Immediate and CFC-Future ($\chi^2(1) = 0.92$, $p = 0.34$); but the autoregressive paths for both BSCS and DGI-10 were stronger than those for CFC-Immediate and CFC-Future ($\chi^2(3) = 22.01$, $p < 0.001$).

Regarding the cross-legged effects, there was a bidirectional association between self-control and delay of gratification. The lagged effect of BSCS on DGI-10 was statistically significant ($\beta = 0.157$, $p = 0.001$, 95% CI [0.051, 0.218]), as was the lagged effect of DGI-10 on BSCS ($\beta = 0.097$, $p = 0.035$, 95% CI [0.008, 0.222]); and these lagged effects did not differ in size ($\chi^2(1) = 0.07$, $p = 0.79$). This indicates that self-control predicts change in delay of gratification few months after, and viceversa, above and beyond what could be explained by each construct at Time 1.

Notably, self-control and delay of gratification differently predicted the CFC dimensions over time. While the lagged effect of BSCS was statistically significant only on CFC-Immediate ($\beta = -0.176$, $p = 0.035$, 95% CI [0.012, 0.339]), the lagged effect of DGI-10 was statistically significant only on CFC-Future ($\beta = 0.223$, $p = 0.026$, 95% CI [0.026, 0.419]). After controlling for prior levels of the constructs at Time 1, self-control predicted change in consideration of *immediate* considerations, and delay of gratification predicted change in consideration of *future* consequences. Providing further confirmation of the distinction between the CFC dimensions, the lagged effect of CFC-Immediate on CFC-Future was statistically significant ($\beta = -0.189$, $p = 0.001$, 95% CI [0.078, 0.297]), while the lagged effect of CFC-Future on CFC-Immediate was not ($\beta = 0.087$, $p = 0.138$, 95% CI [-0.030, 0.215]).

5. Discussion

The present study arguably provides the first examination of the longitudinal relations between self-control, delay of gratification and consideration of immediate/future consequences. The results showed that the measures of self-control and delay of gratification were equally stable over time and were more stable than the measures of consideration of immediate/future consequences. While individuals' standings on self-control and delay of gratification (as indexed by BSCS and DGI-10, respectively) change little over time, individuals' standings on temporal considerations (as indexed by CFC) undergo reshuffling. This indicates that self-control and delay of gratification are more trait-like and less prone to across-time variability than measures of temporal considerations, which is theoretically expected.

The results also showed a bidirectional association between self-control and delay of gratification, with self-control predicting change in delay of gratification and viceversa. This finding is consistent with the results of a previous longitudinal study showing an relationship between these constructs, with self-control underlying delay of

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