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Feeling Closer to the Future Self and Doing Better: Temporal Psychological Mechanisms Underlying Academic Performance

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Abstract

This research examined the function of future self-continuity and its potential downstream consequences for academic performance through relations with other temporal psychological factors and self-control. We also addressed the influence of cultural factors by testing whether these relations differed by college generation status. Undergraduate students enrolled at a large public university participated in two studies (Study 1: $N = 119$, $M_{age} = 20.55$, 56.4% women; Study 2: $N = 403$, $M_{age} = 19.83$, 58.3% women) in which they completed measures of temporal psychological factors and psychological resources. In Study 2, we also obtained academic records to link responses to academic performance. Future self-continuity predicted subsequent academic performance and was related positively to future focus, negatively to present focus, and positively to self-control. Additionally, the relation between future focus and self-control was stronger for continuing-generation college students than first-generation college students. Future self-continuity plays a pivotal role in academic contexts. Findings suggest that it may have positive downstream consequences on academic achievement by directing attention away from the present and toward the future, which promotes self-control. Further, the strategy of focusing on the future may be effective in promoting self-control only for certain cultural groups.

Why is it that despite the enormous value of a college degree, millions of students drop out every year and fail to attain knowledge, experience, and credentials that will benefit them for the rest of their lives? The college graduation rate was 38.6% in 4 years, 54.3% in 5 years, and 58.8% in 6 years for the cohort of students starting in 2005, across all public and private 4-year institutions in the United States (Aud et al., 2012).

First-generation college students struggle even more; the graduation rate for this group was 27.4% in 4 years, 44.8% in 5 years, and 50.2% in 6 years in 2011 (DeAngelo, Frank, Hurtado, Pryor, & Tran, 2011). This disparity may reflect some of the different challenges facing first-generation students, such as having greater demands on their time.

The present research seeks to understand, in the academic context, why individuals fail to act in their own best interest in a way that could have dire consequences for their future. We hypothesize that individuals who do not feel connected to their future are more likely to make choices that have negative long-term consequences. Prior research has shown that *future self-continuity*—the extent to which individuals feel connected to and compatible with their future selves—predicts monetary time preference and financial decisions (e.g., Bartels & Urminsky, 2011; Hershfield, 2011; Hershfield et al., 2011; see also Oyserman, 2009; Oyserman & Destin, 2010). Future self-continuity may also play an important role in the academic context. Building on recent findings that demonstrate a significant relationship between future self-continuity and self-control (Hershfield, Cohen, & Thompson, 2012), we theorize that future self-continuity helps individuals focus more on the long-term consequences of their actions and less on the short-term consequences, which, in turn, promotes self-control. Self-control has been shown to be a robust predictor of academic performance (e.g., Duckworth, Quinn, & Tsukayama, 2012; Tangney, Baumeister, & Boone, 2004).

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Therefore, we propose and test an integrative framework that considers how temporal psychological factors relate to self-control and affect subsequent academic outcomes. First, we review the literature on future self-continuity and how this construct relates to time preference, decision making, and psychological resources. Though this investigation focuses on the academic domain, we review and synthesize the literature in other domains in order to identify and propose a mechanism by which future self-continuity may influence important outcomes. Second, we consider temporal psychological factors and review the relevant literature, providing support for their links to self-control and academic performance. Unlike approaches that place the present and future in opposition to one another (e.g., Frederick, Loewenstein, & O'Donoghue, 2002; Strathman, Gleicher, Boninger, & Edwards, 1994), we consider each separately. We posit this approach will enable a closer examination of the interplay among these temporal psychological factors and how they relate to academic outcomes. Third, we propose a cultural factor—*college generation status*—may affect the pathways in our model of academic achievement. Importantly, we hold that separating consideration of the future from consideration of the present provides a more nuanced understanding of how these psychological processes operate for different cultural groups.

Future Self-Continuity

We propose that the same psychological factors that play a role in decisions that involve trade-offs among costs and benefits occurring at different times (i.e., *intertemporal choice*) also influence how individuals perform in school. Research on future self-continuity shows that perceptions of the future self in relation to the current self affect intertemporal choice (e.g., Hershfield, 2011). Greater continuity with the future self, across a variety of measures, predicts less steep temporal discounting and higher monetary saving (Bartels & Rips, 2010; Ersner-Hershfield, Garton, Ballard, Samanez-Larkin, & Knutson, 2009). When individuals' feelings of connectedness to their future selves were experimentally increased, they exhibited less steep discounting (Bartels & Urminsky, 2011). Similarly, following experimental procedures that increased vividness of the future self, either through an immersive virtual reality environment or by morphing participants' own photos to appear older, participants exhibited greater monetary saving behavior (Hershfield et al., 2011). We draw on these findings concerning future self-continuity and intertemporal choice to inform our thinking about how future self-continuity may play a role in the academic domain. To date, however, little research from this perspective has examined future self-continuity in the academic context.

Also relevant to the current study is the identity-based motivation model (Oyserman & Destin, 2010). The model postulates the dynamic construction of selves, including the present and future, and the perceived congruence between these possible selves and tasks at hand guides cognition and motivation. For instance, interpretation of academic task difficulty depends on whether a task is identity congruent (i.e., similar). When a task feels identity congruent, perceived difficulty affirms that the activity is meaningful; however, when the task is identity incongruent or dissimilar, difficulty is perceived as a cue that the activity is impossible and is "not for me" or "people like me" (Oyserman, Bybee, & Terry, 2006). Interventions applying identity-based motivation are effective in improving academic performance among young students (see Oyserman & Destin, 2010). Both identity-based motivation and the future self-continuity perspective highlight the importance of similarity and connectedness between the present and the future selves. Building on and extending previous research on these approaches, the present research aims to unpack how perceptions of the future self influence academic outcomes via temporal psychological mechanisms that shape psychological resources.

Temporal Psychological Factors, Self-Control, and Academic Outcomes

We hypothesize that future self-continuity promotes self-control by enhancing the priority given to the future and reducing the priority given to the present. Providing preliminary support for this notion, a recent study found that future self-continuity was positively associated with considering future consequences over present consequences and with self-control (Hershfield et al., 2012). We contend that, in the academic context, this psychological process is akin to *temporal discounting*—the tendency for individuals to place a lower value on distant-future outcomes than on equivalent near-future outcomes, to discount the value of future gains (e.g., Frederick et al., 2002; Joshi & Fast, 2013; Trope & Liberman, 2003). That is, people tend to place relatively greater weight on the present than on the future. Though prior research has often pitted weighing present outcomes against weighing future outcomes, we separate the consideration of immediate consequences of one's behavior from the consideration of the future consequences and extend these two distinct, though negatively related, constructs to the domain of academic performance. This is consistent with psychometric work that supports the distinction between consideration of immediate consequences and consideration of future consequences, as opposed to combining them into a bipolar construct (Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008).

Research has documented that consideration of future consequences over immediate consequences is correlated positively with self-reported academic performance (Joireman, 1999; Peters, Joireman, & Ridgway, 2005). In contrast, the present research examines how the consideration of immediate consequences and the consideration of future consequences independently and jointly play out over time to predict academic outcomes via self-control.

Self-control contributes to a wide range of positive outcomes, including task performance, psychological adjustment, and academic achievement (Tangney et al., 2004). We integrate

previous perspectives on temporal psychological factors with past research on self-control and propose an integrative framework that addresses how the interplay of these constructs relates to academic outcomes. In order to persist, one must act in accordance with long-term goals while also directing attention and effort to activities related to these distant, future goals (Baumeister & Heatherton, 1996; Duckworth, Peterson, Matthews, & Kelly, 2007; Mischel et al., 2011; Mischel, Shoda, & Rodriguez, 1989; Trope & Liberman, 2003; Wertenbroch, 1998). We propose that future self-continuity functions to promote self-control by directing individuals' focus toward future goals and away from the short-term demands of their everyday lives. Directing attention away from the present and toward the future may enable individuals to more effectively exert self-control by increasing the salience of desired future outcomes and of the behavioral regulation that facilitates the attainment of those outcomes. Though individuals may consider their future, their future goals, and the long-term consequences of their current behaviors, the behavioral process of attaining those goals and reaching that future requires self-control, making these links particularly impactful for enhancing performance and achievement. We propose that future self-continuity and self-control are associated, yet we maintain these two psychological constructs remain conceptually distinct. Although individuals often exert self-control in service of long-term goals, in service of their future selves, this short-term behavioral self-regulation differs from the extent to which individuals feel similar and connected to their future selves, the extent to which an individual views her future self as the same person as her current self. Thus, self-control represents a psychological resource or tool that helps individuals accomplish their desired future selves.

Role of Culture

Finally, we propose that a cultural factor—college generation status—may influence these psychological processes. A continuing-generation college (CGC) student is an individual who has at least one parent who obtained a 4-year bachelor's degree, whereas a first-generation college (FGC) student is an individual who does not have a parent who completed a 4-year bachelor's degree (i.e., neither parent holds a bachelor's degree). First-generation college students are more likely than continuing-generation college students to come from low-income families (Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012), and they are therefore more likely to take on additional jobs to afford tuition costs while juggling the demands of work and school. That is, first-generation college students may have more frequent and more impactful immediate or short-term obligations and concerns in their lives than their continuing-generation peers. Because of this, challenges and setbacks—either in school or in their personal lives—may be especially consequential and detrimental for first-generation students. In a sense, consideration of the distant future (as opposed to the immediate or short-term future) is more of a luxury for first-generation college students, who may not feel as much control over what the distant future will be. In contrast, continuing-generation college students may feel a stronger sense of control over their distant future and, in turn, be more inclined to regulate behavior that may have long-term consequences. Thus, concerns over the distant future may be more impactful for continuing-generation college students than for first-generation college students. As part of this research, we test how this cultural factor affects the pathways among temporal psychological factors, self-control, and academic performance.

Overview of the Research

We conducted two studies. Study 1 addressed three research questions. Our first research question was whether future self-continuity would predict self-control. Our second question was whether future self-continuity would be negatively related to consideration of immediate consequences (*CFC-immediate*) and positively related to consideration of future consequences (*CFC-future*). Our third question was whether the link between future self-continuity and self-control would be mediated by considering the future more and considering the present less.

Study 2 had three aims. First, we sought to replicate our findings from Study 1. Our second aim was to test whether greater future self-continuity has positive downstream consequences on academic performance. We predicted that academic performance would be related to (a) CFC-immediate negatively, (b) CFC-future positively, and (c) self-control positively. Our third aim was to test whether these relations were moderated by college generation status. We expected that CFC-future would play a more important role in self-control among continuing-generation students than first-generation students, whereas CFC-immediate would play a more important role among first-generation college students than continuing-generation college students.

STUDY 1

Method

Participants. One hundred forty-seven undergraduate students at a large public university in the United States completed this study as an extra-credit assignment in General Chemistry I. The study was administered online via Qualtrics survey software and, because of concerns over random responding, included a catch question that prompted participants to provide a specific answer (i.e., "If you are reading this question, answer 'Not at all like me'"). The final sample included the 119 participants (81% of the total) who provided the correct answer to the catch question. Of the 117 participants who reported their sex, 66 (56.4%) were women.

Measures

Future Self-Continuity. We adapted an established measure of future self-continuity to assess the extent to which

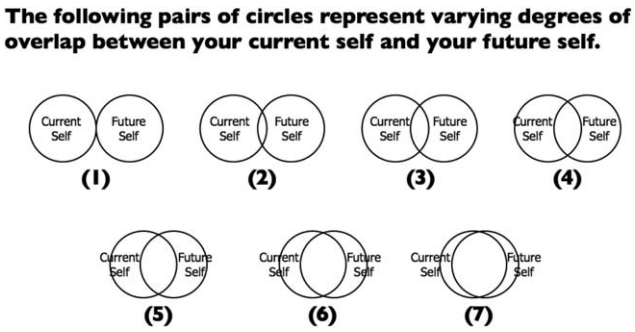

Figure 1 Future self-continuity measure, adapted from Ersner-Hershfield et al. (2009).

participants perceived continuity with their future selves (Ersner-Hershfield et al., 2009). This measure was based on the Inclusion of Other in the Self scale (Aron, Aron, & Smollan, 1992); participants reported (a) how similar and (b) how connected they felt to their future selves 10 years from now on a 7-point scale represented by seven sets of overlapping Euler circles (see Figure 1). As in previous research using this measure (e.g., Bryan & Hershfield, 2012), we averaged the two items to form an aggregate measure of future self-continuity, Cronbach's $\alpha = .64$, $r(117) = .48$, $p < .001$.

Consideration of Future Consequences. The Consideration of Future Consequences (CFC) scale assessed the extent to which individuals consider potential immediate, short-term or distant, long-term outcomes of their behaviors and are influenced by those possible outcomes (Joireman, Shaffer, Balliet, & Strathman, 2012). Though this measure was originally developed as a single-factor scale (Strathman et al., 1994), recent empirical work has suggested that a two-factor model best accounts for responses to the scale (see Joireman et al., 2012). The current version of the scale contains 14 items with two factors: consideration of future consequences-immediate (CFC-immediate; Cronbach's $\alpha = .84$, $N_{items} = 7$) and consideration of future consequences-future (CFC-future; Cronbach's $\alpha = .76$, $N_{items} = 7$). Participants responded to each item on a 7-point scale (1 = *very uncharacteristic of me*; 7 = *very characteristic of me*). Higher scores on CFC-immediate indicated a focus on immediate or short-term outcomes (e.g., "I only act to satisfy immediate concerns, figuring the future will take care of itself"). Higher scores on CFC-future indicated placing more weight on future outcomes and a greater concern with future consequences (e.g., "Often I engage in a particular behavior in order to achieve outcomes that may not result for many years"). Consistent with past research (e.g., Joireman et al., 2012), there was a negative relation between CFC-immediate and CFC-future, $r(117) = -.30$, $p = .001$.

Self-Control. We adapted the Brief Self-Control Scale (Tangney et al., 2004), which measures the capacity to alter inner responses and to refrain from acting on undesired behavioral tendencies, especially to create a more optimal fit between self and environment. Participants responded to 10 items (e.g., "People would say that I have very strong self-discipline") on a 5-point scale (1 = *not at all like me*; 5 = *very much like me*), with higher values coded to represent higher self-control (Cronbach's $\alpha = .83$.)

Results

An examination of the zero-order correlations among future self-continuity, CFC-immediate, CFC-future, and self-control provided support for our proposed model (see Table 1). First, future self-continuity and self-control were correlated positively, $r(117) = .31$, $p = .001$. That is, higher future self-continuity was associated with higher self-control. Second, future self-continuity was correlated negatively with CFC-immediate, $r(117) = -.36$, $p < .001$, meaning that greater continuity with the future self was associated with placing less weight on immediate or short-term outcomes of one's behaviors. Third, future self-continuity was correlated positively with CFC-future, $r(117) = .22$, $p = .02$, such that greater future self-continuity was associated with placing more weight on future, long-term outcomes. Fourth, higher CFC-immediate was associated with lower self-control, $r(117) = -.55$, $p < .001$, and higher CFC-future was associated with higher self-control, $r(117) = .45$, $p < .001$. That is, focusing on long-term outcomes was associated with better self-control, whereas focusing on immediate, short-term outcomes was associated with poorer self-control.

We then examined the mediated effect of future self-continuity on self-control via CFC-future. The asymmetric confidence interval (ACI) for the indirect effect of future self-continuity predicting self-control via CFC-future did not contain zero, 95% ACI [.01, .105], indicating a significant indirect effect (Tofighi & MacKinnon, 2011). The direct relation between future self-continuity and self-control, however, remained significant when controlling for CFC-future, $\beta = .13$, $t(116) = 2.66$, $p = .009$. These findings suggest that future self-continuity had an indirect effect on self-control through CFC-future, and that CFC-future partially explained the direct association between future self-continuity and self-control. That is, future self-continuity was associated with increased focus on the

Table 1 Study 1: Correlations, Means, and Standard Deviations for Future Self-Continuity, Consideration of Future Consequences-Future, Consideration of Future Consequences-Immediate, and Self-Control

Measure	1	2	3	4	*M*	*SD*
1. FSC	—				4.23	1.22
2. CFC-i	–.36***	—			3.43	1.07
3. CFC-f	.22*	–.30***	—		5.23	.79
4. SCS	.31***	–.55***	.45***	—	3.26	.72

Note. $N = 119$. FSC = future self-continuity; CFC-i = consideration of future consequences-immediate; CFC-f = consideration of future consequences-future; SCS = self-control.
*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

future, which in turn was associated with increased self-control, and the direct positive association between future self-continuity and self-control remained over and above the indirect pathway through focus on the future.

Next, we tested whether CFC-immediate mediated the relation between future self-continuity and self-control. The asymmetric confidence interval for the indirect effect of future self-continuity predicting self-control via CFC-immediate did not contain zero, 95% ACI [.052, .176], indicating a significant mediated effect. In a regression equation predicting self-control from future self-continuity and CFC-immediate, future self-continuity was no longer a significant predictor of self-control, $\beta = .08$, $t(116) = 1.53$, $p = .13$. This suggests that future self-continuity had an indirect association with self-control via CFC-immediate and that the direct relation between future self-continuity and self-control was explained by CFC-immediate.

Discussion

Taken together, these findings lend preliminary support to the notion that future self-continuity is associated with increased focus on long-term, future outcomes and decreased focus on short-term outcomes, which, in turn, are associated with increased psychological resources pertaining to the regulation of goal-directed behavior. Specifically, future self-continuity may promote self-control by directing individuals' attention away from present, short-term demands and focusing it on future, long-term goals, though additional research is needed to establish the causal direction of these relations.

STUDY 2

Study 2 sought to replicate and extend the findings from Study 1 in three important ways. First, we sought to demonstrate the interplay among future self-continuity, consideration of immediate and future consequences, and self-control has substantive effects on academic performance. Second, we tested these relations in a path model, which allows us to test individual paths between variables while controlling for the other variables in the model. Third, we examined how a cultural factor—college generation status—may moderate relations among future self-continuity, present focus, future focus, self-control, and academic performance.

Method

Study 2 was a 12-week longitudinal study with two waves of data collection. During the fifth and sixth weeks of the semester, participants completed an online survey that included the primary measures of interest: future self-continuity, consideration of future consequences, consideration of immediate consequences, and self-control. We used the same instruments as in Study 1. In addition, we obtained participants' consent to link their responses to their university records. The second wave of data collection consisted of students' final semester grade point average (GPA) on a 4.0 scale, calculated approximately 12 weeks after the first wave of data collection. This served as an objective measure of academic performance.

Participants. Four hundred ninety-one undergraduate students at a large public university enrolled in College Algebra or College Mathematics participated in this study for course credit. We included a catch question identical to the one described in Study 1; the final sample contained the 403 participants (82.08% of the total) who provided the correct response to the catch question, 235 (58.3%) of whom were female.

Of the participants who reported their college generation status, 159 (40.05%) were FGC students, and 238 (59.95%) were CGC students. As expected, FGC and CGC students differed regarding their self-reported socioeconomic status (SES) in terms of household income: In this sample, 27 participants identified as working class (59.3% FGC; 40.7% CGC), 57 identified as lower-middle class (61.4% FGC; 38.6% CGC), 188 identified as middle class (44.7% FGC; 55.3% CGC), 109 identified as upper-middle class (20.2% FGC; 79.8% CGC), and 16 identified as upper class (12.5% FGC; 87.5% CGC). A greater proportion of FGC students reported lower SES, whereas a greater proportion of CGC students reported higher SES.

We did not observe college generation status differences in future self-continuity, $t(395) = .17$, $p = .87$; CFC-immediate, $t(395) = -.65$, $p = .52$; self-control, $t(394) = .95$, $p = .34$; or semester GPA, $t(358) = -.71$, $p = .48$. In terms of CFC-future, FGC students ($M = 5.16$, $SD = .96$) reported higher scores—that is, a greater focus on the future—than did CGC students ($M = 4.90$, $SD = .85$), $t(395) = 3.02$, $p = .003$. The two groups did not differ in terms of high school GPA, $t(246) = 1.40$, $p = .16$.

In order to ascertain whether prior academic performance predicted future self-continuity, we examined participants' standardized test scores. In terms of standardized test scores on the SAT and ACT—all converted to be on the SAT scale out of 1600—the mean for this sample of 976.15 ($SD = 127.31$) fell slightly below the university average as well as the national average of 1010 (College Board, 2014), $t(303) = -4.64$, $p < .001$. Participants in this study were recruited from low-level math courses, so most students in these courses were less prepared and had lower standardized test scores. Consistent with previous research, CGC students achieved higher standardized test scores ($M = 1000.06$, $SD = 118.46$) than did FGC students ($M = 942.70$, $SD = 132.90$), $t(298) = -3.92$, $p < .001$.

Importantly, participants' test scores were not correlated with future self-continuity, $r(302) = -.01$, $p = .89$; CFC-future, $r(302) < .001$, $p = .997$; or self-control, $r(301) = -.04$, $p = .44$. Test scores were, however, correlated with CFC-immediate, $r(302) = -.14$, $p = .02$, and semester GPA, $r(299) = .19$, $p = .001$. The correlation between standardized test scores and future self-continuity was virtually zero, which suggests that previous academic aptitude did not predict perceptions of the future self among first-year college students. These findings

Table 2 Study 2: Correlations, Means, and Standard Deviations for Future Self-Continuity, Consideration of Future Consequences-Future, Consideration of Future Consequences-Immediate, Self-Control, and Semester GPA

Measure	1	2	3	4	5	*M*	*SD*
1. FSC	—					4.23	1.32
2. CFC-i	–.10*	—				3.73	.93
3. CFC-f	.29***	–.39***	—			5.01	.83
4. SCS	.24***	–.44***	.40***	—		3.15	.75
5. Sem GPA	.12*	–.20***	.15**	.26***	—	2.63	.93

Note. For relations with semester GPA, $N = 366$. For all other relations, $N = 403$. FSC = future self-continuity; CFC-i = consideration of future consequences-immediate; CFC-f = consideration of future consequences-future; SCS = self-control; Sem GPA = semester grade point average.
*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

suggest that observed effects of future self-continuity were independent of previous academic performance.

Results

Overall, we replicated our findings from Study 1 and found initial support for our proposed relationships in our examination of the zero-order correlations among the constructs of interest (see Table 2). Consistent with Study 1, there was a positive correlation between future self-continuity and self-control, $r(400) = .24$, $p < .001$; a negative relation between future self-continuity and CFC-immediate, $r(401) = –.10$, $p = .04$; and a positive relation between future self-continuity and CFC-future, $r(401) = .29$, $p < .001$. Replicating the relations observed in Study 1, CFC-immediate was associated negatively with CFC-future, $r(401) = –.29$, $p < .001$; CFC-immediate was associated negatively with self-control, $r(400) = –.39$, $p < .001$; and CFC-future was associated positively with self-control, $r(400) = .40$, $p < .001$.

Next, we extended our findings in Study 2 by examining an objective academic outcome, semester GPA. Consistent with our prediction, greater continuity with the future self was associated with higher semester GPA, $r(364) = .12$, $p = .02$. Also as predicted, we found that CFC-immediate was correlated negatively with semester GPA, $r(364) = –.20$, $p < .001$; CFC-future was correlated positively with semester GPA, $r(364) = .15$, $p = .004$; and self-control was correlated positively with semester GPA, $r(363) = .26$, $p < .001$. Taken together, these findings replicated our initial findings from Study 1 and extended the influence of future self-continuity to an objective measure of subsequent academic performance.

Path Model Analysis

Analytic Approach. In order to examine the relations in our model while controlling for the other variables, we tested our path model using MPlus, version 7.2 (Muthén & Muthén, 1998–2014).

These analyses utilized full information maximum likelihood (FIML) to handle missing data. To assess model fit, we used the chi-square test, the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), and the comparative fit index (CFI). Model fit was considered acceptable when RMSEA < .08 (Browne & Cudeck, 1993), CFI > .95, and SRMR < .08 (Hu & Bentler, 1999).

Model and Fit. We tested a model that included future self-continuity as an exogenous variable and CFC-future, CFC-immediate, self-control, and semester GPA as endogenous variables (see Figure 2). In this model, (a) future self-continuity predicted CFC-future, CFC-immediate, and self-control; (b) CFC-future and CFC-immediate were negatively related and predicted self-control; and (c) self-control predicted semester GPA. Fit indices indicated this model fit the data well, $\chi^2(1) = 1.55$, $p = .21$; RMSEA = .037 (.000–.144); SRMR = .013; CFI = .998.

Future self-continuity as a predictor. As expected, future self-continuity predicted lower CFC-immediate, higher CFC-future, and higher self-control. Given that only the path from future self-continuity to semester GPA was not estimated, the value of the chi-square test indicated that the inclusion of this path would not improve model fit. Thus, the association between future self-continuity and semester GPA was mediated by the other variables in the model. Unlike Study 1, the association between future self-continuity and self-control remained significant when controlling for the other variables in the model ($\gamma = .08$, $SE = .03$, $p = .001$).

CFC-immediate and CFC-future as predictors. As in Study 1, CFC-immediate and CFC-future had a significant, negative relation to each other. Both CFC-immediate and CFC-future significantly predicted self-control, as expected. The paths between CFC-immediate and semester GPA ($\beta = –.09$, $SE = .06$, $p = .13$) and between CFC-future and semester GPA ($\beta = .04$, $SE = .06$, $p = .52$) were not significant after accounting for self-control.

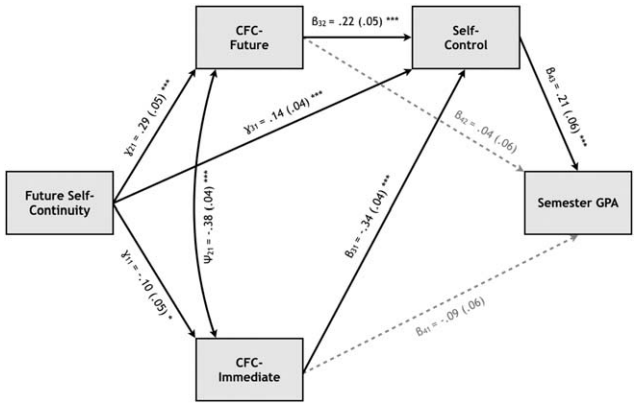

Figure 2 Study 2: Path model describing relations among future self-continuity, consideration of future consequences-future, consideration of future consequences-immediate, self-control, and semester GPA. Standard errors are given in parentheses. Solid black lines refer to significant paths, and gray dotted lines refer to nonsignificant paths.†$p < .1$. *$p < .05$. **$p < .01$. ***$p < .001$.

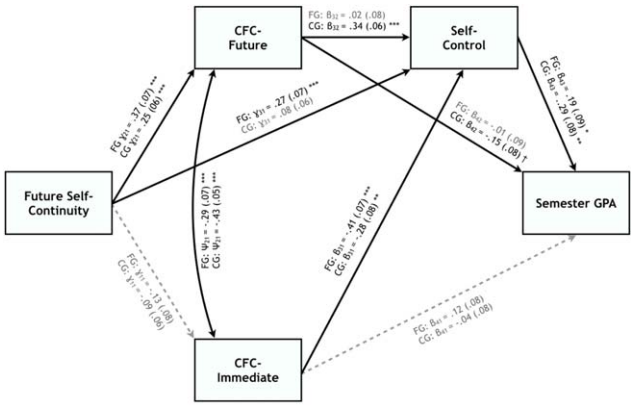

Figure 3 Study 2: Path model stacked by college generation status describing relations among future self-continuity, consideration of future consequences-future, consideration of future consequences-immediate, self-control, and semester GPA. FG = first-generation college students; CG = continuing-generation college students. Standard errors are given in parentheses. Solid black lines refer to significant paths, and gray dotted lines refer to nonsignificant paths.†$p < .1$. *$p < .05$. **$p < .01$. ***$p < .001$.

Self-control as a predictor. Finally, as expected, self-control predicted academic performance. As self-control increased, students earned higher semester GPAs. Taken together, these findings lend support to our proposed model.

Role of Culture: College Generation Status. Next, we investigated whether these psychological processes were similar for first-generation college students and for continuing-generation college students. We tested a version of our model that was stacked by college generation status in order to examine whether college generation status moderated any of the pathways (see Figure 3).

To test metric (pattern) invariance—whether the two groups' path coefficients significantly differed from each other—we ran a fully constrained base model that fixed the path coefficients for first-generation college students and continuing-generation college students to be equal. Then, in a series of nested models, this constraint was released for each path, one at a time, and we inspected the change in model fit from that base model (see Table 3). The only nested model that improved fit was the model that released the constraint on the equality of the relation between CFC-future and self-control. That is, this path was estimated separately for first-generation and for continuing-generation college students, rather than fixing it to be equal for both groups. The path from CFC-future to self-control was not significant for first-generation students ($\beta = .02$, $SE = .07$, $p = .76$). In contrast, this path was significant and stronger for continuing-generation students ($\beta = .31$, $SE = .06$, $p < .001$). In this model, considering the future consequences of one's actions was a significant predictor of self-control for continuing-generation college students but *not* for first-generation college students.

In addition, we conducted multiple regression analyses that predicted self-control from CFC-future, separately for first-generation and for continuing-generation college students. Although this regression equation was significant for both groups, we found that it accounted for a greater proportion of the variance for continuing-generation college students, $F(1, 235) = 71.27$, $p < .001$; $R^2 = .23$, $R^2_{adj} = .23$; $\beta_{CFCfcent} = .44$, $t(235) = 8.44$, $p < .001$, than it did for first-generation college students, $F(1, 157) = 10.69$, $p = .001$; $R^2 = .06$, $R^2_{adj} = .06$; $\beta_{CFCfcent} = .23$, $t(157) = 3.27$, $p = .001$. When interpreted alongside the invariance testing and path coefficients, these findings illuminated important, nuanced points. It was *not* the case that there was no significant overall relation between CFC-future and self-control for first-generation college students; there was, but this relation was not as strong as it was for continuing-generation college students. For first-generation college students, the path between CFC-future and self-control was not significant in our model ($\beta = .02$, $SE = .08$, $p = .76$), indicating that this relation no longer held when controlling for the other variables in the model.

Lastly, it should be noted that the link between future self-continuity and self-control in the model was significant for first-generation students ($\gamma = .27$, $SE = .07$, $p < .001$) but not for continuing-generation students ($\gamma = .08$, $SE = .06$, $p = .14$),

Table 3 Study 2: Examination of College Generation Status Moderation of Relations in Path Model Through Pattern Invariance Testing Using Comparison of Nested Models

Model	χ^2 (*df*)	CFI	RMSEA [CI]	SRMR	$\Delta\chi^2(1)$	$\Delta\chi^2$ *p*
Base model, fully constrained	18.15 (11)	.972	.057 [.000, .103]	.057	n/a	n/a
Release CFC-i with CFC-f	16.10 (10)	.976	.055 [.000, .103]	.042	2.05	.15
Release CFC-f on FSC	17.70 (10)	.970	.062 [.000, .109]	.062	.45	.50
Release CFC-i on FSC	18.15 (10)	.968	.064 [.000, .110]	.057	< .001	1.00
Release SCS on FSC	17.45 (10)	.971	.061 [.000, .108]	.061	.70	.40
Release SCS on CFC-f	11.44 (10)	.994	.027 [.000, .084]	.049	6.71	.01
Release SCS on CFC-i	18.15 (10)	.968	.064 [.000, .110]	.056	< .001	1.00
Release Sem GPA on CFC-f	17.60 (10)	.970	.062 [.000, .108]	.059	.55	.46
Release Sem GPA on CFC-i	17.02 (10)	.973	.059 [.000, .107]	.054	1.13	.29
Release Sem GPA on SCS	17.88 (10)	.969	.063 [.000, .109]	.055	.27	.60

Note. Each path released is the only path released; that is, paths were released one at a time. FSC = future self-continuity; CFC-i = consideration of future consequences-immediate; CFC-f = consideration of future consequences-future; SCS = self-control; Sem GPA = semester grade point average.

though there was a significant indirect effect of future self-continuity on self-control via CFC-future for continuing-generation students (estimate = .09, $SE_{estimate}$ = .03, p = .001).

GENERAL DISCUSSION

This research demonstrates that future self-continuity plays a vital, beneficial role in the academic context and that cultural factors influence the interplay among temporal psychological factors and psychological self-regulatory resources. We tested whether higher future self-continuity has positive downstream consequences for undergraduate academic performance through its relations with other temporal psychological constructs and with psychological resources. In addition, we also examined how these processes differ for first-generation and continuing-generation college students. First, we found the hypothesized relations among future self-continuity, consideration of the future, consideration of the present, and self-control: Greater continuity with the future self relates to higher self-control, higher consideration of future consequences, and lower consideration of immediate consequences of one's actions. Second, we extended these findings to objective academic outcome; future self-continuity predicts subsequent semester GPA. Third, we examined the role of college generation status and demonstrated that the relation between consideration of future consequences and self-control is stronger for continuing-generation college students than it is for first-generation college students.

These findings contribute to the literature by demonstrating future self-continuity plays an important role in the academic context and has downstream consequences on academic achievement. Past research has primarily examined future self-continuity as it relates to financial decisions, such as monetary time preference (Bartels & Rips, 2010; Bartels & Urminsky, 2011) or investment behavior (Hershfield et al., 2011). Importantly, this research extends the influence of future self-continuity to the academic domain, which has implications for major life outcomes. We theorize future self-continuity improves academic outcomes by directing focus away from present demands and toward possible long-term rewards, in turn promoting psychological resources and thus enhancing academic performance. These data support this account.

This research also contributes to the literature through its examination of how culture influences temporal psychological factors. Though past research has documented mean-level cultural differences in temporal psychological variables—for example, a recent study on health perception shows that first-generation college students have higher present-fatalistic orientation (i.e., the sense that the future is predetermined regardless of individual actions) compared to their continuing-generation counterparts (Guthrie, Butler, & Ward, 2009) —these findings show that aspects of culture may influence the underlying processes of how temporal psychological factors relate to psychological resources. Most striking was how college generation status moderated the relation between consideration of future consequences and self-control. Past research has documented the positive association between consideration of future consequences and self-control (Joireman et al., 2008), but the current study is the first one to demonstrate that this relation is stronger for continuing-generation college students and weaker for first-generation college students. The present findings suggest that the psychological processes underlying future self-continuity and academic outcomes differ between these two cultural groups. For first-generation college students, higher future self-continuity is directly associated with higher self-control, which may promote academic performance. For continuing-generation college students, higher future self-continuity may increase consideration of the future and decrease consideration of the present, which may promote self-control and improve academic performance. Future research should verify the causal relationships among these constructs.

Recall that first-generation students reported greater consideration of future consequences than did continuing-generation students. Perhaps this is because first-generation college students do hold a deep concern for their future and are strongly encouraged to think about their future by others. At first glance, this may seem like a good, beneficial strategy, but digging deeper into the impact of these temporal psychological factors reveals that consideration of the future is not associated with self-control and academic performance for these individuals. Our findings imply that to gain a more nuanced, thorough understanding of the relations between aspects of culture and temporal psychological factors, we should not only probe for mean-level differences but also closely examine how cultural factors moderate the impact of temporal psychological factors.

Of importance, these findings imply distinct strategies for helping members of these two different groups perform in school. For continuing-generation college students, encouraging them to focus on the future, on their future goals, and on how their current actions affect their future may be a successful strategy to increase self-control and, in turn, select behaviors that promote achievement. In contrast, telling first-generation college students to simply look to the future may not be enough to promote self-control. For these students, instead, it may be more effective to implement a targeted intervention designed to increase their feelings of similarity and connectedness to their future self. This approach may be more successful in promoting self-control, encouraging motivation, and improving academic outcomes for these students. Further, these findings may reveal the differences in challenges facing these two groups of college students. One possibility is that first-generation college students face more competing (and immediate) demands than continuing-generation college students do. Another possibility is that the presence, or absence, of role models plays a role in linking contemplation of the future to behavioral self-regulation. Continuing-generation college students—who, by definition,

are likely to have more educational role models than first-generation college students—may not only focus on the future but also link the attainment of that future to hard work, self-control, and delay of gratification, in addition to having a greater familiarity with the many incremental steps involved and their importance. Together, these differences may contribute to the differences in the strength of the observed relationships found.

LIMITATIONS AND FUTURE DIRECTIONS

One limitation of this study was that it focused on a single aspect of future self-continuity: connectedness. Hershfield (2011) proposed that vividness and positivity compose other aspects of future self-continuity. Little research has examined the relationships among these aspects and their effects on important life outcomes within a single study. It remains an empirical question, and a direction for future research, to determine which aspect or aspects of future self-continuity are most influential in the academic context and beyond.

Another interesting direction for future research is to identify antecedents of future self-continuity, the factors that may promote or inhibit future self-continuity. Having positive role models who evoke positive representations of others, such as successful adults, can help children understand the connection between hoped-for identities and the actions necessary to attain those identities. Successful adults, such as parents, teachers, and friends' parents, can serve as role models and set examples for perseverance during difficult times (Oyserman et al., 2006). In contrast, underrepresented minorities and first-generation college students from lower-income families may be unable to envision the benefits of a college degree as concrete or obtainable due to the absence of positive role models in their lives, and well-meaning authority figures may not know how to help them achieve desired possible selves. While many students value education highly, those who perceive a greater distance to their eventual goal may be less motivated. For example, lower SES and first-generation college students with only a vague image of what a future with a college degree looks like may perceive the future as further away and less likely to turn out favorably. Having education-relevant role models may help students see the similarity between their present self and the future with a college degree; after all, these role models may indicate particular goals for which an admirer should aim, and suggest the road that one should follow to achieve those goals (Collins, 1996; Lockwood & Kunda, 1997).

If it is the case that educational role models influence future self-continuity, then one might wonder why we did not observe college generation status differences in future self-continuity in Study 2. One possibility is that future self-continuity is a greater selection factor for entering college among first-generation students than continuing-generation students. Another possibility relates to the timing of Study 2 and the type of student sample. Perhaps differences between first-generation and continuing-generation college students had not yet emerged at the beginning of the second semester. That is, a history of educational role models may be more influential later in one's academic career, such as when one is choosing among and navigating various academic paths, facing daunting academic setbacks, or approaching graduation. By assessing the absence or presence of academic role models, future research can address these possibilities.

Additionally, it would be interesting to examine the stability of future self-continuity over time in the academic context. A recent study has demonstrated the test-retest reliability of the future self-continuity measure employed in our studies (Ersner-Hershfield et al., 2009, Study 1). The authors of the study stated that the two data collections were separated by at least 1 week; thus, these data may not have captured fluctuations in future self-continuity over time. Many students face setbacks and receive negative feedback in the form of poor grades. It may be the case that such negative feedback attenuates future self-continuity, in which case we would expect that future self-continuity may decline among low-performing students shortly following midterm papers and examinations. Alternatively, high future self-continuity may serve a buffering function against negative feedback and allow students to maintain their focus, self-control, and motivation in the face of frustrating forces. A fruitful future direction will be to examine the stability and malleability of future self-continuity over time and whether it has psychologically protective effects or whether it fluctuates with academic setbacks and successes. In addition, a vital future direction will be to develop, implement, and assess manipulations of future self-continuity that can easily be administered in an academic setting. Tailoring such manipulations to the academic context may enhance the positive downstream effects of future self-continuity on performance in school.

CONCLUSIONS

The academic success of millions of undergraduate students is of vital importance to the future of our nation and its economy, not to mention the prosperity of those students themselves. Because it is of grave concern that such a large proportion of students who start college never finish, we sought to develop our scientific understanding of the mechanisms underlying academic achievement to contribute to future solutions. These studies highlight the role of future self-continuity and other temporal psychological factors in self-control and academic performance, further validating the future self-continuity perspective and extending it beyond the monetary and financial domains to the academic domain. Our findings suggest promising, practical implications for further research on future self-continuity and recommendations for how to optimally tailor interventions to

first-generation students. Through this and future work, we hope to ameliorate the severe problem of college retention and improve academic success.

Declaration of Conflicting Interests

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