**Replication of “When Does the Future Begin? Time Metrics Matter, Connecting Present and Future Selves” (Study 7) by Lewis & Oyserman (2015, *Psychological Science*)**

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**Introduction**

The main finding from the original study is that the use of particular time metrics affected the perceived nearness of events, and how soon participants felt they should start preparing for those events. This finding has implications for when people will start saving for retirement or engage in other behaviors that might be beneficial in the future but may not hold any immediate benefits. I am to replicate Study 7, which found that when participants read vignettes that framed events in terms of fine-grained time metrics (e.g., days) compared to gross-grained time metrics (e.g., years), they were less likely to engage in temporal discounting (i.e., prioritize current rewards over future rewards). Importantly, this relationship was mediated by how connected participants felt to their future self and perceived congruence between their current and future self. Thus, when participants read vignettes that used fine-grained time metrics, they felt more connected to their future self, which led them to feel greater congruence with their future self, and in turn had a lower temporal discounting rate. These results held after controlling for demographics (age, income, education) and self-control measures (grit, and “interpretation of difficulty”).

**Methods**

**Power Analysis**

*[Original effect size, power analysis for samples to achieve 80%, 90%, 95% power to detect that effect size. Considerations of feasibility for selecting planned sample size.]*

**Planned Sample**

Participants in the original study were 324 MTurk workers with U.S. IP addresses ranging in age from 18-73 (*M* = 35.6, *sd* = 11.3). Participants were 80% White, most had completed some college (82%), and earned less than $50,000 (75%). This sample appears to be representative of the population of MTurk workers (e.g., Ipeirotis, 2015); thus, my only restriction will be MTurk workers with U.S. IP addresses. I will stop collecting data once I have reached the planned sample size.

**Materials**

**Independent Variable.** The first independent variable is scenario [saving for college or retirement]. The second independent variable is time metric [fine-grained vs. gross-grained]. Stimuli include the following 4 scenario x time metric vignettes:

1. "Imagine you have a newborn child. You realize your child will be ready for college in only 6,570 days."

2. "Imagine you have a newborn child. You realize your child will be ready for college in only 18 years."

3. "Imagine you plan to retire. You realize you will be ready for retirement in only 14,600 days."

4. "Imagine you plan to retire. You realize you will be ready for retirement in only 40 years."

**Mediators.** Mediators include 'identity connection' and 'identity congruence'. Participants rated all items on a 7-point Likert-type scale, from 1 = *strongly disagree* to 7 = *strongly agree*.

Identity connection (a = .81) is measured with 4 items: “The person I am now and the person I will be in [18 years or 6,570 days/ 30 years or 10,950 days] are pretty much the same person,” “When I try to imagine the person I will be in [18 years or 6,570 days/ 30 years or 10,950 days] it is as if I am imagining a person other than myself (reverse coded),” “The person I will be in [18 years or 6,570 days/ 30 years or 10,950 days] does not look like me at all (reverse coded],” “The person I will be in [18 years or 6,570 days/ 30 years or 10,950 days] is a stranger to myself (reverse coded).”

Identity congruence (a = .71) is measured with 4 items: “I cannot imagine being [the parent of a college student/being a retiree] (reverse coded),” “The identity of a [‘retiree’/’college mom or dad’] is just something I cannot imagine as me at all (reverse coded),” “My identity as [a parent/an adult] includes saving for [college/retirement],” “My identity as a person conflicts with some of the trappings of adulthood like saving for [college/retirement] (reverse coded).”

**Dependent Variable.** The dependent variable, temporal discounting rate, will be assessed with the 27-item Kirby Monetary Choice Questionnaire (Kirby, Petry, & Bickel, 1999). For each item, participants are asked to choose whether they would prefer to receive a smaller amount of money today, or a larger amount in a variable amount of days. Examples of items include “Would you prefer $54 today, or $55 in 117 days?” and “Would you prefer $31 today, or $85 in 7 days?” The rate is calculated by solving for *k*, the rate parameter of a hyperbolic discounting function (Myerson, Baumann, & Green, 2014). The original author used macros to calculate this rate and I will attempt to obtain them.

**Demographics and Covariates.** Demographic items will include age, income, and years of education. Covariates include two measures of control: interpretation of experienced difficulty (Oyserman, Destin, & Novin, 2015) and grit (Duckworth & Seligman, 2005). I do not yet have access to the Interpretation of Experienced Difficulty scale. The grit measure is 12 items and participants respond to each item with a 5-point Likert scale (1 = not like me at all, 5 = very much like me). Grit is calculated by creating an average score.

**Procedure**

“…Each participant was randomly assigned to one of [four] scenarios: college in 18 years or 6,570 days and retirement in 30 years or 10,950 days. They were asked about their sense of connection and congruence between their present and future selves. These posited mediators were followed by a standard set of questions to calculate temporal discounting generally (not related to saving for their child’s college or to their own retirement). Then we obtained demographic and self-control covariate controls (interpretation of experienced difficulty as importance, Oyserman, Destin, & Novin, 2015; and grit, Duckworth & Seligman, 2005).” (p. 820)

**Analysis Plan**

The authors excluded 8 participants from their analysis, but it is unclear why this was done. I will exclude participants if they are missing data on the dependent variable (temporal discounting). “Mediation was tested via identity connection, identity congruence, and temporal discounting.” (p. 820) The authors “tested the prediction that time metric influences temporal discounting via its effect on experienced connectedness between the present and future selves and hence the congruence of the present and future self. We tested this prediction, controlling for demographic variables [age, income, education] and self-control measures [grit, interpretation of difficulty as importance], using PROCESS for SPSS Version 2.12, Model 6, with a bootstrap sample of 10,000 reiterations (Hayes, 2013).” (p. 821)

**Differences from Original Study**

Sample setting and overall demographics are expected to be similar to the original study (although the authors do not report full demographics, only % White, % under $50,000, etc.). I do not anticipate that differences in demographic measurement will have a large impact on the results because the original results held whether controlling for covariates or not. Once calculated, however, sample size may be different from the original study. This would be due to availability of class funds, and may result in an underpowered study that is unable to detect the effect, if it exists (which is small). I currently have all measures used in the original study except for the measure of “interpretation of difficulty as importance,” which is an original scale developed by the second author. I will contact the original author for this measure. Should I succeed, I will use identical measures for all constructs. When contacting the original authors I will also ask for the macros they used for calculating temporal discounting rate (dependent variable). Should I be unable to secure this macro, this likely would have only a small impact on results because other papers report how to calculate this rate. Finally, I will aim to limit the exclusion of participants. It is unclear why the authors excluded 8 participants from their final analysis, but I will include all participants unless they are missing data on the dependent variable, because this would make the temporal discounting rate difficult to calculate.

**References**

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