PB230: REPLICATION

-Study Preregistration-

**Study Title:** *Prescribed Optimism: Is it Right to Be Wrong About the Future?* by David A. Armor, Cade Massey & Aaron M. Sackett (2008, *Psychological Science*)

# I. Introduction

People tend to make optimistically biased predictions about their personal futures. For example, we anticipate living longer than average, and we overestimate our chances of success in the job market (Weinstein, 1980). This observation conflicts with the assumption that our primary goal is to be accurate in our predictions. The original study explored–amongst other things–what kind of predictions (accurate, optimistic, or pessimistic) one ought to make.

Researchers found that participants (n = 127) clearly felt they ought to make optimistic predictions, rather than accurate or pessimistic ones: *t*(124) = 10.36, *prep* > 0.99, *p* < .001, Cohen’s *d* = 0.93 (Armor, Massey, & Sackett, 2008). Overall, the modal prescription was *moderately optimistic* (+2 on a scale from -4[extremely pessimisitic] to +4[extremely optimistic]), which participants felt they ought to make almost twice as often as an *accurate* prescription (0 on the scale; 32.3% vs. 17.7%). These findings support the view that people believe optimistically biased predictions are ideal.

But is this the case? Many theories of behavior science rest on the assumption that people desire to be accurate when making personal predictions. This study was not preregistered, nor were the analyses declared prior to data collection. The article has been cited 90 times and findings disseminated in both the print and broadcast media without any replication effort to confirm the observed results. This replication study will do just that.

**Research Question:** Do college students prefer to make optimistic predictions about their personal futures than accurate ones?

# II. Methods and Measures

**Power Analysis**

The original effect size for the one-sample t-test that tested the primary prediction was Cohen’s *d* = .93, 95% CI .72, 1.14. A power analysis using the pwr R package (Champely et al., 2020) to determine the sample sizes necessary to achieve 80% power to detect the effect size indicates that a sample with 12 total participants is necessary. As is clear from these analyses the original study was well powered to detect a Cohen’s d = .93 and had a post-hoc power of essentially 1.00. Calculations for original study power are found in the power notebook of the research compendium.

**Planned Sample**

To achieve a very high power I only need a small number of participants because the original effect size was large. To give the original effect the best possible chance to succeed I used a power calculation of 80% Power and based the calculation of the lower confidence interval bound of the effect size (0.72). This analysis indicated that I need N = 38 to replicate the study assuming 80% power and a lower bound effect size estimate. Calculations for replication study power are also found in the power notebook of the research compendium. I also commit to collecting data from at least an additional 10 people to provide a "cushion" in case there is missing data. Importantly, in the PBS lab it is likely that it will be possible to collect data from additional participants and so N = 48 is the lower limit of the planned sample size. In the PBS lab, studies are run for one week at a time and data collection will stop at the end of one week. In this sample, participants will be student participants and will be compensated with course credit. The average LSE sample is typically between 18 and 22 years old and is primarily European and female.

**Materials**

All materials were obtained directly from the original authors. Because the primary result is based on only people in one of the between-subject experimental conditions (the “prescriptions” condition) I will only replicate this condition. Participants will be asked:

*“to imagine one of four different settings in which predictions (a) would be relevant and (b) might range from overly pessimistic to overly optimistic. These settings, chosen for breadth, included decisions about a financial investment, an academic-award application, a surgical procedure, and a dinner party. For each setting, we created eight vignettes by independently manipulating three variables known to be related to optimism: commitment (whether the decision to engage in a particular action has or has not been made; Armor & Taylor, 2003), agency (whether the decision to commit was, or will be, made by the protagonist or by another person; Henry, 1994), and control (the degree to which the protagonist can influence the predicted outcome; Klein & Helweg-Larsen, 2002). Each participant was randomly assigned to one setting and received all eight vignettes, in counterbalanced order, within that setting” (Armor, Massey, & Sackett, 2008, p. 329).*

In the between-subjects condition that I replicate, the “prescriptions” condition, participants will be “asked to provide *prescriptions* (i.e., to indicate whether it would be best to be overly pessimistic, accurate, or overly optimistic for each of the eight vignettes” (Armor, Massey, & Sackett, 2008, p. 329, italics in the original). “Response options ranged from -4 (*extremely pessimistic*) through 0 (*accurate*) to +4 (*extremely optimistic*)” (Armor, Massey, & Sackett, 2008, p. 329, italics in the original) with additional labels at -2 (*moderately pessimistic*) and +2 (*moderately optimistic*). Consistent with the original study, participants will also complete several other questions about the desirability of the scenario panning out, the probability of that happening, and three other questions associated with the three variables manipulated in the scenario.

**Procedure**

Participants will arrive at the laboratory and will complete the study in a paper-and-pencil format, consistent with the original study. After completing an informed consent form, participants will receive instructions, complete the experimental materials, complete the Life Orientation Test, and finally complete the demographic variables (gender, age, ethnicity, and year in college). This will closely replicate the prescriptions condition from the original study in its entirety. In the LSE lab, participants will complete experimental materials alone in a study room or in a shared space separated from others by privacy dividers. Participants will be instructed to complete their materials independently and to refrain from checking cellular devices throughout the study. Like with many psychology labs, the replication study will likely be included with several other studies in one experimental session.

# III. Confirmatory Hypotheses & Analysis Plan

**Confirmatory Hypotheses**

In line with the original study, the confirmatory hypotheses are as follows:

H1: The mean prescribed recommended prediction will be greater than zero

H0: The mean prescribed recommended prediction will not be different from zero

**Analysis plan**

**Confirmatory analyses.** Participants who did not complete all the measures we analyze will not be included (i.e. a listwise deletion strategy). Participants’ prescribed optimism responses will be averaged together across the vignettes. First, the descriptive statistics will be reported for the participant characteristics and study measures (i.e., means and standard deviations). The original test of the primary hypothesis is a one-sample *t*-test that compares the average responses on the prescribed optimism measure to zero (the mid-point of the scale). I will report the mean, t value and degrees of freedom, and Cohen’s d, alongside the p value for t. A successful replication will find evidence of support for the alternate hypothesis.

**Exploratory analyses.** I also plan to conduct some exploratory analyses. First, I will also see what the modal prescribed optimism response is and see how that compares to the frequency of accurate responses (see Armor, Massey, & Sackett, 2008, p. 329). Second, and consistent with the original study, I will also conduct the same two-stage one-sample t-test strategy described above for each of the eight vignette conditions (see Armor, Massey, & Sackett, 2008, p. 329).

A full analysis plan, including analysis syntax, is found in the syntax notebook of the research compendium.

# IV. Differences from Original Study

There are several differences between the original study and our replication.

1. In the original study (but not noted in the original article), participants were recruited from campus locations at Yale University or at the University of Chicago’s Graduate School of Business’s Decision Research Lab (two elite private American universities). The replication study will recruit participants from the LSE in London, UK, which is a different setting and context. Social anthropometric observations suggest the British are more pessimistic in general than people in the USA (Fox, 2004). Although it may be out-of-date, a cross-country comparison found results consistent with this observation (Michalos, 1988; data collected between 1978 and 1987). This is a difference that I feel may have the potential to influence the results.
2. Participants in the original study were compensated with a Snapple drink (Yale Sample) or with $3 (University of Chicago Sample). In my sample, participants will likely complete the study for course credit. I do not anticipate that receiving course credit instead of a tasty drink or money will influence the results unduly, but it is a difference worth noting.
3. I will not collect data on the between-subject experimental conditions that do not test the primary result. Because these are between-subject conditions, it is logically extremely unlikely that they will influence the outcome of the replication. But again, this difference in methods is worth noting.

In summary, although there are differences between the original and the replication studies, we believe these differences are either trivial, or will be transparently reported. In either case, the replication of this study in a different context will provide not just evidence of the robustness of the effect but also its generalizability (Nosek & Errington, 2020).

# VII. References

Armor, D. A., Massey, C., & Sackett, A. M. (2008). Prescribed optimism: Is it right to be wrong about the future?. *Psychological Science*, *19*, 329-331.

Fox, K. (2004). *Watching the English: The hidden rules of English behaviour.* London, UK: Hodder

Michalos, A. C. (1988). Optimism in thirty countries over a decade. *Social Indicators Research*, *20*, 177-180.

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Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology, 39*, 806-820.