Preferences, Ability, and Intrinsic Motivation

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Recommended Citation
Taylor, Matthew P., "Preferences, Ability, and Intrinsic Motivation" (2018). University Grant Program Reports. 49.
https://scholarworks.umt.edu/ugp-reports/49
The UGP grant in the amount of $5,000 that I received was used to pay human subjects for participating in an economics experiment. With Institutional Review Board approval, the experiment was conducted at the University of Montana between October 2017 and April of 2018. Subjects were recruited via email with the permission of the instructors from a variety of courses, to include: astronomy, biology, chemistry, mathematics, philosophy, political science, and economics. The 160 subjects who participated in the experiment have a diverse array of majors, and, on average, each subject received $32.98 for participating in the experiment. I also had three undergraduate economics students assist with the administration of the experiment.

The results from my experiment have resulted in a paper, which I will submit to the *Journal of Economic Behavior & Organization* within the next month. I presented this paper in a seminar at Montana State University on September 21, 2018.

1 Paper Abstract

I use an experiment to test whether economics experiments that have explored the relationship between cognitive ability and several important economic behaviors have biased estimates because they fail to account for the impact of differences in intrinsic motivation. I find that monetary incentives do not significantly improve subject performance on the types of questions that are commonly used to measure cognitive ability. I also find that estimates of the relationships between cognitive ability and strategic reasoning, trust, and risk aversion are not significantly different whether cognitive ability is measured with or without monetary incentives. Consistent with the existing literature, subjects with higher cognitive ability demonstrate higher levels of strategic reasoning and they tend to be more trusting; however, in contrast to some prior studies, they are not more risk tolerant.

2 Summary

Economists have generated a substantial literature exploring the relationships between cognitive ability and decision making, such as investing behavior, time preferences, risk preferences, trust, and level of reasoning. In the experimental studies that have explored these relationships, the typical protocol measures the economic behavior of interest with decisions that are incentivized with monetary payoffs, but does not incentivize performance on the tests used to measure cognitive ability.

Although it does reduce the cost of an experiment, it is somewhat surprising that the standard protocol that economists have adopted to explore these relationships uses an un incentivized test to measure cognitive ability for two reasons. First, economists generally agree that incentives matter when a task requires effort, and the tests that are used to measure cognitive ability certainly do. Second, there is empirical evidence that suggests that the effect of incentives on performance on ability tests is heterogenous and that incentives can increase the scores of individuals with

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low-baseline cognitive ability scores. The effects of these differences in intrinsic motivation can be significant—potentially, one standard deviation in performance.

The consequences for ignoring the role of intrinsic motivation in our measures of ability are two-fold. First, it is possible that the estimated relationships between decision making and ability are actually being primarily driven by differences in intrinsic motivation. Individuals with high levels of intrinsic motivation may actually enjoy solving the problems, puzzles, and “brain-teasers” presented to them during the cognitive ability tests and decision-making tasks. Second, it is possible that the estimated relationships between preferences and ability are stronger and our estimates are biased downward because high-ability individuals with low intrinsic motivation are misidentified as low-ability individuals. This possibility, however, assumes that monetary incentives improve performance and that may not necessarily be the case.

This study addresses this gap using an experiment that measures cognitive ability for every subject under incentivized and unincentivized conditions with two nine-item tests, each including a subset of six CRT questions, and then compares whether incentives increase performance on the ability test and whether the estimated relationship between ability and economic behavior depends on the incentive conditions under which ability was measured. I focus on three types of economic behaviors that are important to decision making and have been shown to be correlated to cognitive ability in prior studies: the level of reasoning or strategic sophistication, trust, and risk preferences.

I find that subjects do not perform significantly better on the cognitive ability test that is incentivized with monetary payments relative to the one that is not. Subjects who perform relatively better when the test is incentivized also tend to perform relatively better when it is not. This lack of difference in performance holds for the subset of CRT questions, as well. Additionally, paying subjects did not significantly reduce the proportion of subjects who gave the impulsive response for the CRT questions.

I also find that estimates of the relationship between cognitive ability and strategic reasoning, trust, reciprocity, and risk aversion are not significantly different when cognitive ability is measured with an unincentivized test. Regardless of the conditions under which ability was measured, the results from this experiment support the following conclusions: (a) subjects with higher cognitive ability tend to average lower guesses in the beauty contest game and earn more money; (b) higher ability subjects tend to trust more than lower ability subjects when playing the trust game but that trust does not result in greater earnings; (c) cognitive ability is not correlated with reciprocity; and (d) cognitive ability is not correlated with risk preferences.