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Developing a computer game for measuring delay discounting

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Introduction

Would you prefer \$75 now or \$100 in the future? What about an unhealthy dessert now or good health in the future? Both of these questions involve a smaller sooner reward option and a larger later reward option. These types of choices can be described in part by delay discounting.

- **Delay discounting** is the tendency for rewards to lose value when they are presented after a delay.
- **Impulsivity** is defined as a pattern of choosing smaller sooner rewards. High levels of impulsivity are associated with problematic behaviors.

High levels of impulsivity are associated with high levels of delay discounting. People who have drug addiction or smoking problems, share needles, or are obese tend to discount more than other people. There are methods for reducing delay discounting rates in individuals. Decreasing delay discounting in people could have societal benefits.

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Methods

I am designing an open-access computer game to assess delay discounting. Subjects will complete this game and another delay discounting task. Our current methods have some limitations:

- Subjects do not always pay careful attention and because some of the procedures take a long time this can skew our responses.
- Some tasks are not fully supported by previous research as accurately assessing delay discounting.

Figure 1. Time influences how one perceives a reward

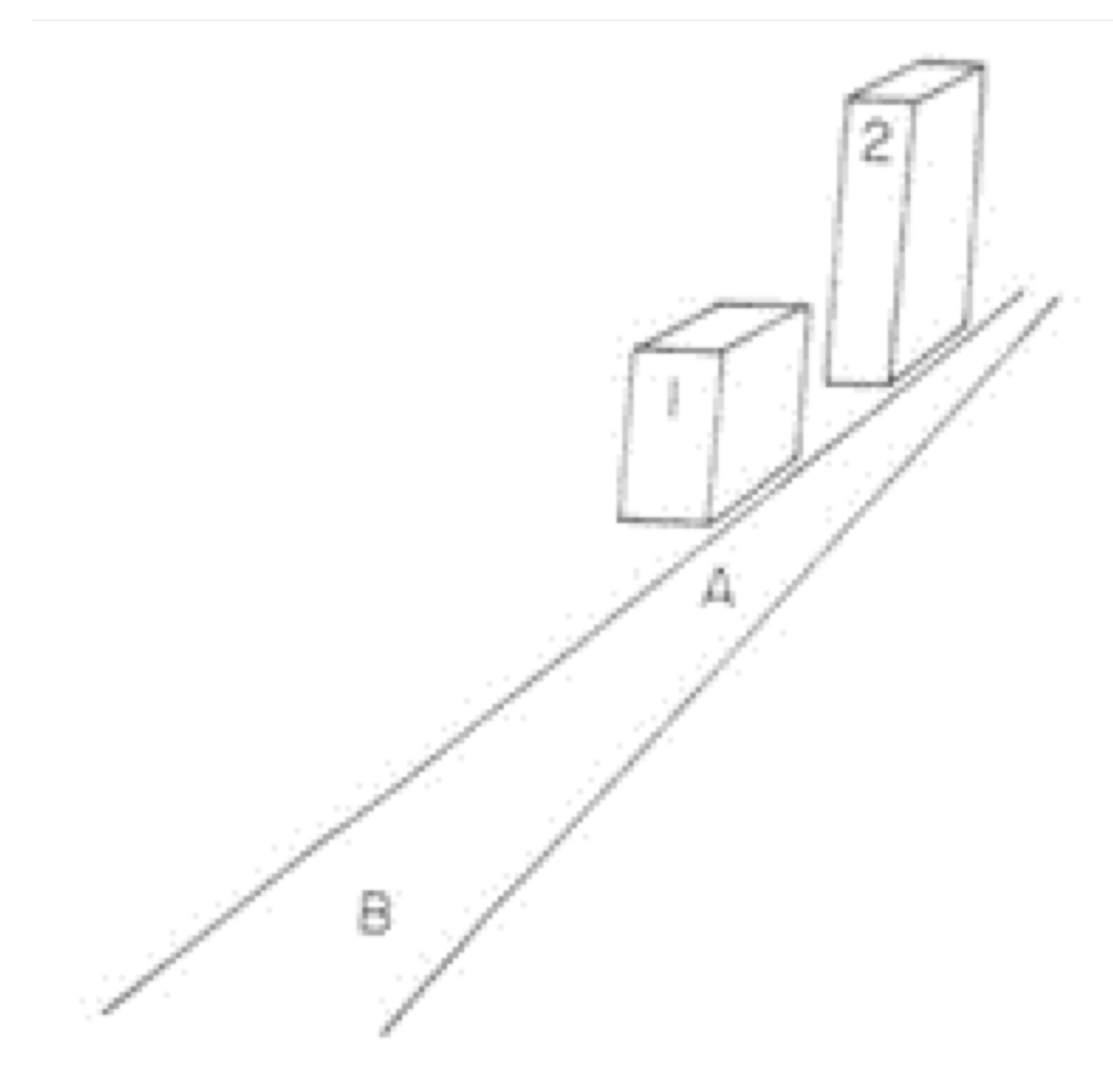


Figure 1: At point A, it might be hard to tell which building is bigger. At point B, it is clear that building 2 is bigger. Similarly, in the moment, it may be hard to decide what outcome is better.

Hypothesis

Our prediction is that delay discounting levels measured by our game will be correlated to delay discounting levels in another established measurement method. If participants score similarly on our method and other established methods, then we are probably measuring the same phenomenon. See the expected results graph in Figure 2. We expect to be able to predict smoking status or drug use status based on delay discounting rates from our game.

Figure 2. Expected results

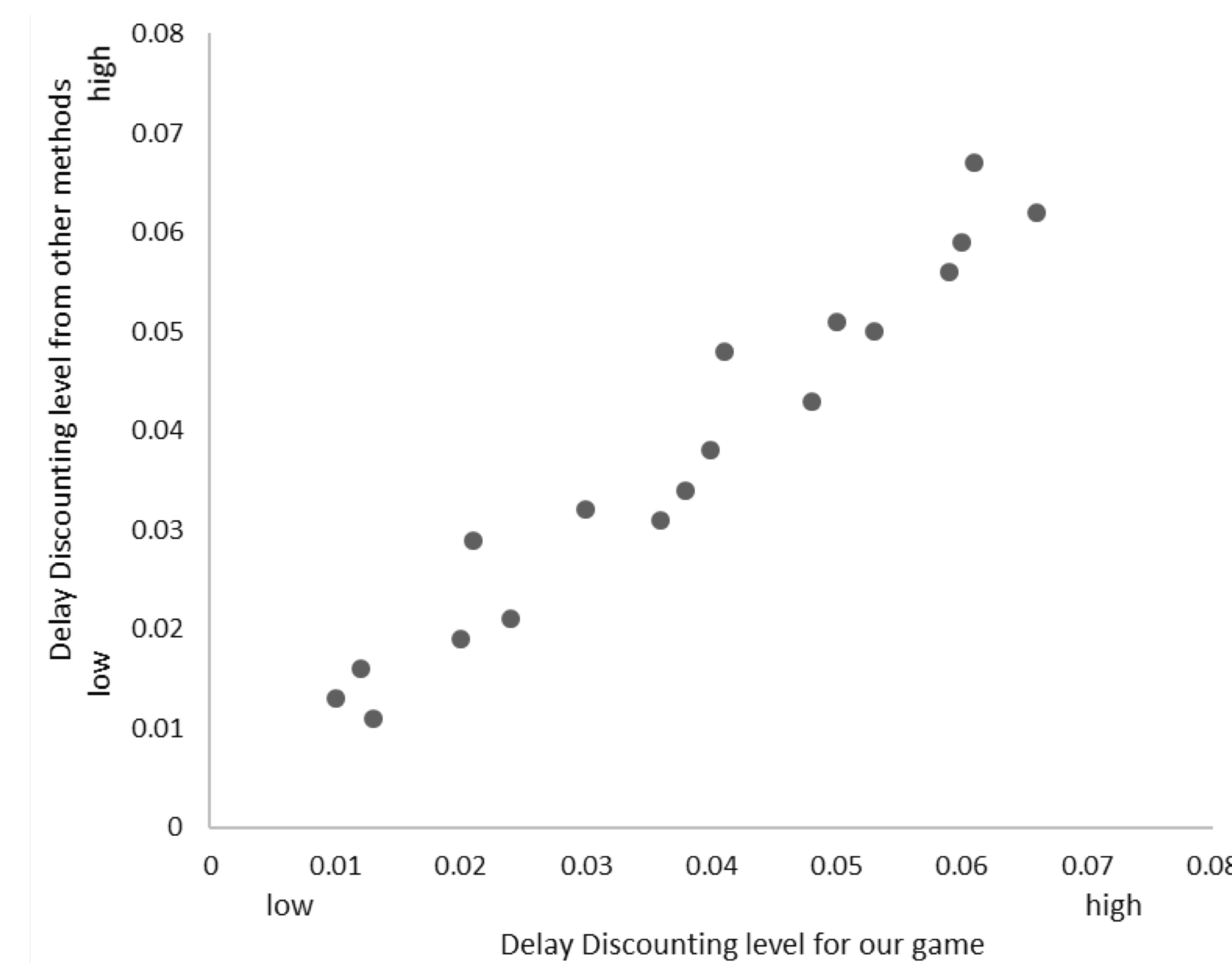


Figure 2: We expect that people who score high on delay discounting in one task will also score high in another delay discounting task.

Figure 3. Gameplay view



Figure 3: Subjects can click to choose between a smaller sooner reward or a larger later reward in the delay discounting computer game.

Conclusions

This game has the potential to become a recognized tool for measuring delay discounting. A common method would allow scientists to easily compare results.

In the future, our game could be used in other studies that aim to reduce delay discounting levels. Reductions in delay discounting levels may help people to make better long term decisions.

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