



## Temptation and commitment in the laboratory



Daniel Houser<sup>a</sup>, Daniel Schunk<sup>b</sup>, Joachim Winter<sup>c</sup>, Erte Xiao<sup>d</sup>

<sup>a</sup> George Mason University, United States

<sup>b</sup> Johannes Gutenberg University Mainz, Germany

<sup>c</sup> University of Munich, Germany

<sup>d</sup> Monash University, Australia

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### ABSTRACT

We report data from a novel laboratory experiment on economic decisions under persistent temptations. This type of temptation is ubiquitous, as it refers to any temptation that is present until one either gives in or makes a costly commitment decision to have it removed. Subjects in our experiment are repeatedly offered an option with instantaneous benefit that also entails a substantial reduction to overall earnings. We show that this option is tempting in the sense that a substantial fraction of our subjects incur pecuniary costs to eliminate the choice, and thus commit not to choose this alternative. We find that commitment and giving in to temptation generally occur at the first opportunity, though a non-negligible fraction of subjects delay either making the commitment decision or giving in to temptation. This delay is consistent with the costs of self-control increasing with its use.

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## 1. Introduction

Because temptation can interfere with attaining long-term goals, the ability to resist temptation is an important skill. In this paper, we investigate behavior under “persistent” temptations. That is, temptations that appear repeatedly until one either succumbs to the temptation or uses a (possibly costly) commitment device to remove it. For example, saving money requires consistently controlling the impulse to consume immediately. Also, to complete a time consuming task can require continuous effort to resist the temptation to procrastinate. Since self-control is difficult, people frequently turn to external devices to assist them in resisting. One such device is to intentionally exclude the tempting good from a choice set, as has been studied in a number of contributions (e.g. Fudenberg and Levine, 2006; Gul and Pesendorfer, 2001; Noor, 2007). For instance, a person trying to avoid eating meat may commit to dining only at vegetarian restaurants, or people may choose to set up a deadline to help overcome procrastination (Ariely and Wertenbroch, 2002).

The questions of when people choose to use a commitment device when facing a persistent temptation and how that choice is affected by the cost of commitment are of significant economic importance. In particular, economic theory suggests that the timing of commitment, or the time at which one succumbs to temptation, can depend on how the cost of self-control changes with the use of self-control (e.g., Fudenberg and Levine, 2012). Here we present a novel laboratory experiment that informs how people make decisions under persistent temptation, and thus provides evidence on the specification of models of behavior under temptation.<sup>1</sup>

E-mail addresses: dhouser@gmu.edu (D. Houser), daniel.schunk@uni-mainz.de (D. Schunk), winter@lmu.de (J. Winter), erte.xiao@monash.edu (E. Xiao).

<sup>1</sup> An early draft of this paper (Houser et al., 2010) reported data from a similar design that included a “surprise” temptation, as compared to the full-information design analyzed below. We are grateful to an anonymous referee for encouraging this alternative design and analysis.

How people make decisions under temptation has long been a topic of interest in both psychology and economics. [Strotz \(1955–1956\)](#), develops theoretical explanations for time-inconsistent decision-making.<sup>2</sup> More recently, it has been shown that temptation and commitment can be modeled in a time-consistent manner.<sup>3</sup> These and related theoretical developments are grounded in a broad empirical literature demonstrating that humans are affected by temptation and sometimes succumb to it (see, e.g., [Mischel et al., 1989](#)).<sup>4,5</sup> Further, data from natural and field experiments provide evidence for the importance of temptation in real economic choices.<sup>6</sup> In psychology, substantial evidence suggests cognitive load (which is thought to reduce the ability to exercise “willpower”) leaves subjects more likely to choose tempting goods.<sup>7</sup>

The psychic cost of exercising self-control can encourage people to use commitment devices to resist temptation. Early research considered a variety of commitment devices that restricted individuals’ choice sets, for instance, by visiting a restaurant with fewer tempting foods ([Werthenbroch, 1998](#)), by using specific ordering strategies that enforce watching “high-brow” movies ([Read et al., 1999](#)), by removing the ability to make choices in the future ([Casari, 2009](#)), or by committing to saving plans ([Ashraf et al., 2006](#); [Benartzi and Thaler, 2004](#); [Beshears et al., 2015](#)). In addition to commitment, other strategies to avoid succumbing to temptation can involve increasing the cost giving in ([Schelling, 1992](#); [Gine et al., 2010](#); [Kaur et al., 2010](#); <http://www.stickk.com/>)<sup>8</sup> distracting oneself from the temptation, or forcing oneself to use certain personal rules of conduct (see [Baron, 2000](#); [Elster, 2000](#); [Ariely and Werthenbroch, 2002](#)).

Given the vast empirical evidence on people’s difficulties in resisting temptation and their effort to use commitment devices, it is important for economists to develop an improved understanding of whether these devices are adopted with delay, and whether and how the timing of their use is affected by the benefit of resisting the temptation and the cost of commitment. That is, it is important to know more about the timing and elasticity of decisions in environments with persistent temptations. To shed light on this, we designed a new laboratory experiment that allows the cost of commitment and the cost of giving in to a temptation to be manipulated exogenously and independently. This control enables us to discover systematic patterns in commitment under temptation that would be difficult to observe in field data.

In an environment with persistent temptation it can be optimal, under perfect foresight, to delay one’s decision to commit depending on whether the costs of exercising self-control increase with its use, as shown for instance by [Fudenberg and Levine \(2012\)](#). They first note that in a model without cognitive resources, “it is always cheaper to commit now to avoid a future temptation than to do so later when the temptation is more imminent” (p. 29). In their Example 9 they then show that once a model with cognitive resource is augmented with a commitment cost, then it might pay to use the cognitive resources to exert self-control until its marginal benefit is sufficiently high and then to pay the commitment cost, taking the temptation off the table. In order to provide evidence on whether self-control costs might change in this way, participants in our laboratory environment are exposed to the same tempting stimulus multiple times. On each exposure, they can either: (i) give in to the temptation; (ii) make a (perhaps costly) commitment decision that removes any future exposures to the temptation; or (iii) resist the temptation without choosing to commit, thus being exposed to it again in the future. Participants are provided complete information at the beginning of the experiment about all aspects of the environment, including the specific way that temptation and opportunities to give-in or commit will evolve over time. Consequently, our experiment sheds light on whether delay in commitment occurs in a perfect foresight environment.<sup>9</sup>

We find that the majority of our participants either commit or give in immediately, or resist temptation until the end of the experiment. This result is consistent with [Fudenberg and Levine \(2012\)](#) under the condition that there are unchanging (positive) costs to exercising self-control.<sup>10</sup> This behavior is also consistent with predictions from many other models of temptation, including [Noor \(2007, 2011\)](#), [Fudenberg and Levine \(2006, 2011\)](#), [Gul and Pesendorfer \(2001\)](#), and in general models that rely on quasi-hyperbolic discounting ([Strotz, 1955–1956](#); [Phelps and Pollack, 1968](#); [Laibson, 1997](#); [O’Donoghue and Rabin, 1999](#)).<sup>11</sup>

<sup>2</sup> Subsequent theoretical approaches and reviews of this vast literature include [Thaler and Shefrin \(1981\)](#), [Laibson \(1997\)](#), [O’Donoghue and Rabin \(1999, 2000\)](#), [Bénabou and Tirole \(2004\)](#), [Heidhues and Köszegi \(2009\)](#), and [Caillaud and Jullien \(2000\)](#).

<sup>3</sup> Important contributions to the theoretical literature on temptation and commitment include [Gul and Pesendorfer \(2001, 2004, 2005\)](#), [Fudenberg and Levine \(2006, 2011, 2012\)](#), [Noor \(2007, 2011\)](#), [Miao \(2008\)](#), [Ozdenoren et al. \(2012\)](#), [Dekel et al. \(2009\)](#), and [Ali \(2011\)](#).

<sup>4</sup> Additional empirical results in this literature are due to [Hoch and Loewenstein \(1991\)](#), [Ainslie \(1992\)](#), [Loewenstein and Prelec \(1992\)](#), [Baumeister et al. \(1994\)](#), [Metcalf and Mischel \(1999\)](#), [Ameriks et al. \(2007\)](#), [Charness and Gneezy \(2009\)](#), [Casari \(2009\)](#), [Augenblick et al. \(2015\)](#), [Bonein and Denant-Boémont \(2015\)](#), and [Corgnet et al. \(2015\)](#); see also [Bryan et al. \(2010\)](#) for a survey.

<sup>5</sup> It is worth emphasizing that the early “marshmallow task” delay of gratification experiments (see the survey by [Mischel et al., 1989](#)) as well as the later derivatives of these experiments ([Buccioli et al., 2011](#)) generally include a “persistent temptation” of the sort studied in this paper. The same is true of early studies of procrastination and deadlines ([Loewenstein and Prelec, 1992](#)). The advantage to our study is that it offers a carefully controlled environment that allows a more direct test of theory by narrowing the scope for alternative explanations for the patterns in our data.

<sup>6</sup> See [DellaVigna and Malmendier \(2006\)](#), [Houser et al. \(2008\)](#), [Burger et al. \(2011\)](#) and [Buccioli et al. \(2011\)](#).

<sup>7</sup> See [Shiv and Fedorikhin \(1999\)](#), [Baumeister et al. \(1994\)](#), [Baumeister and Vohs \(2003\)](#), [Hinson et al. \(2003\)](#), [Dewitte et al. \(2005\)](#), and [Vohs and Faber \(2007\)](#).

<sup>8</sup> This is a company launched by Ian Ayres and Dean Karlan. A participant signs a contract requiring him/her to donate a self-specified amount of money to charity if he/she fails to achieve a self-specified goal.

<sup>9</sup> [Fudenberg and Levine \(2012\)](#), at the conclusion of their Example 9, suggest the importance of data from these types of environments.

<sup>10</sup> In the sense of [Fudenberg and Levine](#), we mean by unchanging costs of self-control, that the exertion of self-control in period  $t$  increases the self-control costs at  $t + 1$ , and this should not be confused with a temporal convex costs of self-control. In the remainder of the paper, we also call this property “increasing (marginal) costs of self-control”.

<sup>11</sup> See [Fudenberg and Levine \(2012\)](#) for detailed discussion of connections among various leading economic theories of temptation.

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