

Running head: SELF-CONTROL STRATEGIES FOR FINANCIAL GOALS

Self-control strategies for financial goals: Proactive and reactive strategy use and effectiveness

by

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### Abstract

Self-control strategies help people resist tempting situations and make more goal-consistent decisions. I examined strategies in the financial domain through the lens of the Preventive-Interventive and Process models of self-control, distinguishing between proactive strategies used before a spending temptation and reactive strategies used during a spending temptation. I first conducted a meta-analysis to aggregate extant research and to estimate the overall effect size of financial self-control strategies. Strategies reduced spending and increased saving significantly with a medium effect size ( $d = 0.57$ ,  $k = 29$ ). I then examined whether these empirically studied strategies were present in a media sample (104 websites) and in people's personal experiences ( $n = 939$ ). About half the strategies found through the meta-analysis were present in the media sample and were listed by lay participants, and across these three perspectives, the majority were proactive strategies. Next, I examined how strategy use impacted monthly spending in two longitudinal experimental studies. I asked participants to read about proactive vs. reactive strategies (Study 3) or list the proactive vs. reactive strategies they personally already use (Study 4). In Study 3, reminding participants of proactive or reactive strategies did not influence monthly spending compared to an empty control or a "just use willpower" condition. In Study 4, participants described their personal proactive and reactive strategies and watched a brief video highlighting relevant strategies. Participants who described proactive strategies reported spending \$322 less than their goal during the month and significantly differed from the those who described reactive strategies (who spent \$246 more than their goal) but did not differ significantly from an empty control condition. This finding suggests that people's personal proactive strategies can be effective for bringing spending in line with their goals. In sum, the first part of this dissertation summarizes and identifies gaps between the empirical literature, online media, and lay sample perspectives on self-control strategies for financial goals. The second part of this dissertation attempts to manipulate strategy use and assess proactive and reactive strategy effectiveness for bringing spending in line with goals.

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## Introduction

Any goal pursuit is fraught with self-control dilemmas, where a person must choose between indulging in a temptation versus resisting the temptation and pursuing a goal-consistent choice. For instance, when a person's goal is to spend less money, it is necessary to resist daily temptations (e.g., to buy a new gadget, a favorite drink, or to book a vacation) to act in line with the goal. Falling short on goals is common. For example, although most adults want to save for retirement (Finke & Huston, 2013), only 22.9% of Canadians regularly contribute to a Registered Retirement Savings Plan (*Registered Retirement Savings Plan Contributions*, 2017). The average Canadian holds a credit card debt of \$4,236 (*TransUnion Q2 2019 Industry Insights Report*, 2019) and impulse purchases account for as many as 60% of all purchases (Mattila & Wirtz, 2008). Frequent failures in self-control can have pernicious consequences: consistently falling short on financial goals can have implications for financial security, which has been linked to lower quality of life (The WHOQOL Group, 1995) and even physical health struggles (Kahn & Pearlin, 2006).

What are some ways to align people's decisions with their financial goals? One way people can increase goal-consistent choices and more successfully resist temptations is to use self-control strategies. Self-control strategies are a form of self-management that can make goal-consistent decisions more likely, without relying on willpower alone to resist temptations. For example, people tend to spend less money if they make purchases with cash rather than a card (Helion & Gilovich, 2014; Prelec & Simester, 2001; Raghurir & Srivastava, 2008). Therefore, keeping a limited amount of cash on hand, rather than a credit card, may be a helpful strategy to deter oneself from spending in a tempting situation. Such strategies are specific, actionable ways to increase a person's chances of making goal-consistent choices – like self-imposed “nudges”

(Thaler & Sunstein, 2009). Self-control strategies can be used proactively before encountering a spending temptation (e.g., ‘preventive strategies’, Hofmann & Kotabe, 2012; ‘situational strategies’, Duckworth et al., 2014) or can be used in reaction to feeling tempted during a spending situation (e.g., ‘interventive strategies’, Hofmann & Kotabe, 2012; ‘intrapsychic strategies’, Duckworth et al., 2014). My research takes an interdisciplinary approach by drawing upon theory and empirical research from social psychology, behavioural economics, and consumer research. Within the context of the Preventive-Interventive Model of Self-control (Hofmann & Kotabe, 2012), this dissertation compiles self-control strategies for financial goals from the academic literature, the online media, and lay people, as well as assesses the impact of proactive and reactive strategies on spending behaviour.

### **Self-Control**

Self-control is characterized by a conflict between two opposing forces: between the myopic doer and the far-sighted planner (Thaler & Shefrin, 1981); between desire and willpower (Hoch & Loewenstein, 1991); between the hot, emotional system and the cool, cognitive system (Metcalf & Mischel, 1999); between want and should (Milkman et al., 2008); or between immediate gratification and enduring goals (Duckworth et al., 2016). Common across all these conceptualizations of self-control is the struggle between a short-term gain (e.g., impulse purchase) and long-term goal (e.g., retirement saving). Self-control is the deliberate, effortful, and conscious subset of self-regulation (Baumeister et al., 2007), and it is defined as “the self-initiated regulation of conflicting impulses in the service of enduringly valued goals” (Duckworth et al., 2016; p. 36). Self-control conflicts occur when a person must choose between two mutually exclusive, conflicting options (Duckworth et al., 2016; Hofmann & Kotabe, 2012). In such a conflict, choosing one option leads to short-term gratification (e.g., buying a new car),

but is in violation of a person's long-term goals. Meanwhile, choosing the other option results in foregoing current gratification for the promotion of long-term goals (e.g., saving for a down payment on a house). This asymmetrical valuation of short- and long-term goals is critical to generating a self-control conflict. If both options are equally pleasurable in the short-term (e.g., buying a new car vs. going on vacation) or if both promote an important long-term goal (e.g., saving for a house down payment vs. saving for retirement), then a self-control conflict does not occur. Self-control is also self-initiated. A person needs to have the volition to make the decision and the awareness of how this decision impacts their long-term goals when choosing between the conflicting options. This means that situations that call for compliance with authority (e.g., credit card declined because exceeded credit limit) or situations when the decision is made for you (e.g., retirement contributions through employer salary deductions) are not self-control conflicts.

### **Effects of Self-Control**

An abundant amount of research on trait self-control suggests the ability to control one's impulses has wide-reaching benefits in terms of healthy eating behaviour, weight control, academic and work performance, well-being, and prosocial behaviour (de Ridder et al., 2012). High self-control people tend to have more positive relationships (Tangney et al., 2004), better physical health (Wills et al., 2007), improved academic performance (Feldmann et al., 1995), and are more persistent when pursuing goals (Duckworth et al., 2007). Also, people high in self-control experience less conflict between a short-term temptation and a long-term goal and they resolve these conflicts faster than those low in self-control (Schneider et al., 2019). Meanwhile, being low in self-control is associated with negative personal and social outcomes, such as substance abuse (Patton et al., 1995), procrastination (Ferrari & Emmons, 1995), and negative affect (Hofmann et al., 2014). People low in self-control also engage in more ineffective goal

setting and risky behaviour (Baumeister et al., 1998). Self-control does not only impact one's well-being in the short-term but can also predict long-term success. Self-control measured in childhood predicts success in adulthood (i.e., income, savings, physical and mental health), and the predictive strength of childhood self-control rivals the predictive effect of socioeconomic status and intelligence on adulthood success (Moffitt et al., 2011). For example, in the famous marshmallow studies (Mischel et al., 1972; Mischel & Baker, 1975), those children who successfully delayed gratification in the original study were rated as more academically and socially competent over 10 years later (Mischel et al., 1989).

Is self-control relevant to financial decisions? There is evidence that self-control also impacts a person's financial well-being. People high in self-control have a greater propensity to plan and make budgets (Ameriks et al., 2003), engage in less impulsive buying (Roberts & Manolis, 2012), have fewer credit cards and are less likely to have a revolving monthly credit card balance (Mansfield et al., 2003), and are more likely to contribute to their retirement saving (Howlett et al., 2008; Strömbäck et al., 2017). People low in self-control are willing to pay more for an item when paying with a credit card and when the credit limit on the card is higher (Bearden & Haws, 2012).

Trait self-control measures a person's general ability to override impulses to a temptation and to regulate behaviour, thoughts, and emotions (de Ridder et al., 2012; Tangney et al., 2004). Trait self-control is relatively stable across situations and time. On the other hand, state self-control is variable, context dependent, and consists of in-the-moment acts of self-control. Generally, people high in trait self-control perform better at controlling their impulses than those low on self-control (Friese & Hofmann, 2009; Mischel, 1996), but situational factors, such as mood (Fishbach & Labroo, 2007; Tice et al., 2007), working memory (Hofmann et al., 2008),

intoxication (Hofmann et al., 2012), and motivation (Werner & Milyavskaya, 2019), can influence how successfully a person resists temptations in a specific situation. In this research, I focus on state self-control, specifically the role of self-control strategies in tempting situations.

### **Self-Control Strategies**

One way to resist temptations is to exert willpower, suppressing the tempting impulse. In practice, controlling impulses using solely willpower to forego short-term gains for long-term benefits is difficult (Hagger et al., 2010; Inzlicht et al., 2014). Researchers have defined willpower as the ability to resist temptation through effortful inhibition and mental fortitude, whereas self-control is like a ‘toolbox’ of self-control strategies that people can use to find the best ‘tool’ (i.e., self-control strategy) for each situation (Fujita et al., 2020). As I defined earlier, self-control is the active struggle between a short-term temptation and a long-term goal.

Willpower is what is used to resist that temptation in the final stage of a self-control conflict (e.g., “response modulation”, Duckworth et al., 2016; “behaviour enactment”, Hofmann & Kotabe, 2012) where a person must intentionally and effortfully resist the temptation through sheer will – expressed in the phrase “just say ‘no’”. As Fujita and colleagues (2020, p. 7) put it, telling someone “to ‘use willpower’ is akin to telling a person to build a house with a pile of wood”. Successful self-control is not solely based on exerting willpower (Inzlicht & Friese, 2020; Milyavskaya & Inzlicht, 2017; Williamson & Wilkowski, 2020).

Situations which involve exerting self-control are considered more difficult, tiring, and effortful than situations without a self-control element (Hagger et al., 2010). The subjective experience of exerting willpower is an effortful executive function (Inzlicht et al., 2014; Mischel & Ayduk, 2011; Westbrook & Braver, 2015), is a cognitively costly experience (Kool et al., 2013), and is negatively related to subjective well-being (Nielsen et al., 2019). Furthermore,

people tend to overestimate their ability to resist temptation, and these inflated self-control beliefs may lead people to overexpose themselves to tempting situations (Nordgren et al., 2009). Considering how difficult and effortful willpower is, relying on willpower alone may result in self-control failures and falling short on goals.

Self-control strategies can be another way to resist temptations and to act in line with goals without relying on willpower. Although self-control strategies and trait self-control use different approaches, they can both lead to successful self-control (Haws et al., 2012; Hennecke et al., 2019). Self-control strategies are “little tricks we play on ourselves to make us do the things we ought to do or to keep us from the things we ought to foreswear” (Schelling, 1978 p. 290). Researchers have referred to these strategies as self-management strategies (e.g., Schelling, 1978), self-regulation strategies (e.g., Duckworth et al., 2011), and self-control strategies (e.g., Duckworth et al., 2014; Mischel & Mischel, 1987).

Akin to “nudges” (i.e., any attempt that influences people’s behaviour in a predictable way; Thaler & Sunstein, 2009), self-control strategies can be defined as simple, quick, and actionable ways to nudge yourself towards making better decisions in the face of a self-control conflict. For example, a person can use strategies to prevent or limit their options to make it more likely that they will make a decision that is in line with their goals. It is important to recognize that strategies, like nudges, do not replace specialized treatments (e.g., for substance abuse, gambling addiction) or fix systemic issues (e.g., poverty, homelessness). Unlike nudges, strategies are self-imposed by the person, whereas nudges are used by employers, organizations, governments. Concepts such as choice architecture (i.e., organizing the context in which people make decisions; Thaler et al., 2013), mental accounting (i.e., mentally allocating money into expense categories; Thaler, 1985), and hyperbolic discounting (valuing immediate benefits over

future benefits; Ainslie & Haslam, 1992), are relevant both in the literature on nudges and for studying self-control. For example, a person may employ choice architecture to organize a situation in a way that limits tempting choices (e.g., bringing only cash when shopping); a person uses mental accounting when allocating a certain amount of their budget to tempting purchases (e.g., spending only \$15 a week on expensive coffees); and a person experiences hyperbolic discounting when they think about a long-term goal to make a short-term temptation less attractive (e.g., thinking about their retirement needs when receiving a tax refund windfall to prevent themselves from buying the latest smartphone model). Indeed, many of the situations in which nudges are used include self-control conflicts (e.g., increasing saving, Thaler & Benartzi, 2004; paying off credit card debt, Jones et al., 2015; controlling spending, Huang & Pocheptsova Ghosh, 2018).

Throughout this research, I will use the term *self-control strategies* for everything a person does or thinks either *before* or *during* a tempting situation that helps them resolve self-control conflicts between competing short-term gains and long-term goals. Self-control strategies can ease the subjective experience of the self-control conflict (i.e., make the temptation less tempting), suppress the goal-inconsistent choice (i.e. make the tempting choice more difficult), or promote the long-term goal (i.e., make the goal-consistent choice easier). Researchers have speculated that self-control strategies can be an effort-saving way to increase self-control while pursuing valued, long-term goals (Duckworth et al., 2014).

### **Integrating Perspectives on Self-Control Strategies**

In this dissertation, I examine how self-control strategies influence financial goals. This topic combines academic research from the psychology and economics disciplines. Researchers in both disciplines study how a person makes decisions. For example, in economics, the

influential work by Kahneman, Tversky, and Thaler on people's heuristics and biases in decision-making (e.g., Thaler, 1980; Tversky & Kahneman, 1981; Tversky & Kahneman, 1974) shaped future economics research by bringing to light people's inner struggle between the rational, Econ self and the irrational, human self (Loewenstein, 2005; Thaler, 2000). At a similar time, social psychologists were examining people's inner struggle between short-term impulses and long-term gains (e.g., Baumeister & Exline, 1999; Mischel & Patterson, 1976). Until the recent boom of behavioural economics outside academia, psychologists and economists explored concurrently, and often independently, how self-control influences decisions and behaviour. Social psychologists developed theories and tested models to make sense of self-control (e.g., see Inzlicht et al., 2021 for a review of self-regulation models), while behavioural economists examined practical techniques to boost self-control (e.g., see Thaler & Sunstein, 2009 for a review of nudges). Therefore, in the present research, I integrate three perspectives on self-control strategies for financial goals: perspectives within social psychology, other academic perspectives (e.g., behavioural economics, marketing), and non-academic perspectives (e.g., online media, lay people).

### *Perspectives Within Social Psychology*

**Self-Control Strategy Models.** Aside from Schelling's (1978) broad definition of self-control strategies, researchers have developed models and theories to more specifically categorize and study strategies. For example, researchers have organized self-control strategies based on the focus of the strategy (i.e., self-control vs. willpower strategies; Hoch & Loewenstein, 1991), the process of the strategy (i.e., situational vs. intrapsychic strategies; Duckworth et al., 2014), and the timing of the strategy (i.e., preventive vs. interventive strategies, Hofmann & Kotabe, 2012). In the present research, I used the Preventive-Interventive (PI)

Model of Self-Control developed by Hofmann and Kotabe (2012) as a general framework for organizing self-control strategies pertaining to financial goals. Specifically, I focused on the distinction between strategies people can use in anticipation of a tempting situation (e.g., they might avoid walking by a tempting shop when trying to spend less) and strategies people can use once they are experiencing the situation (e.g., when tempted to buy something, they might think about whether they want or need the item).

The PI model consists of seven components of self-control and differentiates the components into preventive and interventive self-control. *Preventive* self-control consists of preventive strategies that people can use to “proactively affect the parameters” of potential, future temptations (Hofmann & Kotabe, 2012, p. 708). *Interventive* self-control addresses the situation when a temptation is already encountered and it consists of six components: desire (i.e., motivation to want a specific object or activity), conflict (i.e., when the desire is at odds with a goal), control motivation (i.e., intention to resist the desire), volition (i.e., enough willpower to adhere to the intention), opportunity constraints (i.e., external factors that limit the range of possible options for actions), and behaviour enactment (i.e., acting on the desire). In the PI model, a temptation occurs only if a desire is in conflict with a goal. The preventive strategies have downstream effects on interventive self-control. For example, commitment contracts (i.e., a preventive self-control strategy) increases a person’s control motivation and opportunity constraints (i.e., interventive self-control) once they are in a tempting situation. The PI model, although laid out in a sequential manner, recognizes that in practice the identified components are dynamic and influence each other. For this dissertation, I focus on the PI model’s distinction between preventive and interventive self-control and interpret my findings according to this general framework.

The PI model shares features with other models of self-control, such as the Process Model of Self-control (Duckworth et al., 2014). The Process model conceives temptations in an impulse-generation cycle, beginning with the situation (e.g., seeing a kitchen with candy), then to attention (e.g., look at candy), then to appraisal (e.g., think “that candy looks delicious”), and finally to a response (e.g., eat a piece of candy). The situation shapes what a person pays attention to, which in turn influences how a person appraises the situation, and finally encourages them to engage with or resist the impulse. If the impulse is strong enough, a person will give in to the temptation. The Process model categorizes strategies according to when in the impulse-generation cycle the strategies are used; situational strategies (akin to the PI model’s preventive strategies) target how a person consciously engages with the situation and intrapsychic strategies (akin to the PI model’s interventive strategies) target how a person uses attention, cognitive change, and response modulation to engage in self-control. According to Duckworth and colleagues (2014), situational strategies are superior to intrapsychic strategies because they are forward thinking, are deployed earlier in the impulse-generation cycle, can trigger intrapsychic mechanisms at later stages of the impulse-generation cycle, and can minimize the subjective distress associated with resisting a short-term gain in favour of a long-term benefit. Recent work has expanded on the Process model to show how self-control strategies can be used in a multi-stage process (i.e., temptation identification, strategy selection, strategy implementation) that can account for using multiple strategies per conflict (Werner & Ford, 2021).

Both the PI model and the Process model see self-control conflict as a procedural experience. The PI model captures the self-control experience from the point where a person forms a desire, before it is determined to be a temptation; next, the model outlines the various components (e.g., motivation, volition, opportunity constraints) of self-control and how a desire

might conflict or reconcile with a goal. In comparison, the Process model has a narrower focus and captures the self-control experience from the point of when a self-control conflict between a desire and a goal is already identified. In the next step, the Process model outlines the ways a person can manage the conflict through situational and intrapsychic strategies. Although the distinction is slight, the PI model thus outlines a more holistic understanding of how someone experiences desires and goals. In terms of the strategies included in each model, the volitional self-control strategies of the PI model and the intrapsychic strategies of the Process model include similar techniques to resist temptation, such as attention control, distraction, cognitive reappraisal, and thought suppression.

Both models distinguish between the strategies people can use before they encounter a temptation (i.e., ‘preventive strategies’, Hofmann & Kotabe, 2012; ‘situational strategies’, Duckworth et al., 2014) and the strategies they can use during a tempting situation (i.e., ‘interventive strategies’, Hofmann & Kotabe, 2012; ‘intrapsychic strategies’, Duckworth et al., 2014). Similarly, when collecting and examining strategies for financial goals, I also make such a distinction. I use the term *proactive self-control strategies* (i.e., preventive or situational strategies) to refer to any strategies that can be used proactively in anticipation of a tempting situation and *reactive self-control strategies* (i.e., interventive or intrapsychic strategies) to refer to strategies that can be used in reaction to a tempting situation (the terms ‘proactive’ and ‘reactive’ taken from Williamson & Wilkowski, 2020).

The PI and Process models propose that proactive strategies are superior to reactive strategies because they remove or limit tempting situations, thereby increasing the likelihood of goal-consistent decision-making. For example, if a person does not bring their wallet when going out and they encounter a spending temptation, they cannot purchase the item and they would be

successful in their self-control. Proactive strategies can also set up downstream mechanisms to increase motivation to control the temptation (e.g., through commitment contracts), to increase volition (e.g., through planning), and to create opportunity constraints (e.g., through situation modification) once a person is in a tempting situation (Hofmann & Kotabe, 2012). Using proactive strategies may minimize the subjective distress associated with experiencing and resisting a temptation. Therefore, self-control models would suggest that when people can anticipate tempting situations, restricting the set of available response options or removing the tempting option entirely is best for successful self-control. When people cannot anticipate a tempting situation or cannot modify the situation, they must rely on reactive self-control strategies.

**Self-Control Strategy Use.** There is growing research in psychology that examines whether lay people spontaneously use self-control strategies in their daily life and how different types of self-control strategies compare in effectiveness. Recent research would suggest that people do spontaneously use strategies in their daily life for academic and health goals (Hennecke et al., 2019; Milyavskaya et al., 2020; Williamson & Wilkowski, 2020). For example, Hennecke and colleagues (2019) asked lay samples to describe the strategies they use in their daily life to understand what types of self-control strategies people spontaneously use. Based on this bottom-up approach, the researchers identified 19 self-control strategy categories organized according to the Process model (Duckworth et al., 2014). In an experience sampling study, people reported on their desires (25% food related, 24% rest related, 13% media related, 10% work related; no finance related category reported) and spontaneous strategy use over seven days (Milyavskaya et al., 2020). The researchers found people use at least one strategy in 89% of the

self-control conflicts they experience and use more than one strategy 25% of the times; using more strategies led to greater self-control success.

Proactive strategies can help people select a situation to completely remove the temptation, modify a situation to limit the strength of the temptation, or plan their responses to the temptation. For example, early research showed rehearsing a planned response to a temptation (e.g., when I see the temptation I will look away, Mischel & Patterson, 1976) is an effective way to ease self-control in-the-moment by preparing in anticipation of a temptation. More recent research shows that when people anticipate a temptation and plan how to approach the temptation, they make more goal-consistent decisions (Duckworth et al., 2016; Williamson & Wilkowski, 2020). Duckworth and colleagues (2016) assessed strategy use and effectiveness in an experimental field study with high school and college students. Students were assigned to use situation modification strategies (i.e., by removing distracting temptations), response modulation (i.e., by exerting willpower), or no strategy to help them pursue their academic goals. After one week, students who used situation modification reported making greater progress on their goal than those who used willpower or no strategies. They found that those students who used willpower did not differ from those who used no strategies. In another study using experience sampling methods, Fischbach and Hofmann (2015) asked people to report on up to four goals throughout the day, and at the end of each day, people rated their goal progress and happiness that day. People were instructed either to anticipate obstacles and plan ways to overcome the obstacles (i.e., implementation intentions, Gollwitzer, 1999) as a proactive self-control strategy or to only anticipate the obstacles or they were given no instructions. The most common goals pursued were pleasure (33%), school/work (29%), and leisure (24%) related; financial goals accounted for 17% of the goals. Those who were instructed to use the proactive self-control

strategy made greater goal progress and were happier at the end of day than those who were given no instructions. This strategy was especially effective for goals perceived to be more challenging. In sum, using proactive strategies in anticipation of a temptation can help create situations where making goal-consistent decisions is more likely.

One downside of proactive strategies is that they require foresight, planning, and control over the situation to be effective. A recent experience sampling study showed that people successfully used proactive strategies in only 9% of their self-control conflicts (Milyavskaya et al., 2020). When a person has limited motivation to control their desires or can not control the tempting situations, reactive strategies can be helpful for unexpected, unprepared for, or unavoidable temptation. Reactive strategies target what we can control – our experience of the temptation – and include a variety of behavioural and cognitive techniques, such as distraction and reappraisal, to reduce the strength of the temptation and aid goal-consistent decision-making (Duckworth et al., 2014; Hofmann & Kotabe, 2012). For example, early research on reactive strategies showed using attentional deployment (e.g., focusing on elements of the situation that favour self-control, Mischel et al., 1972) and cognitive reappraisal (e.g., thinking about the temptation in a different way, Mischel & Baker, 1975) are effective ways to ease self-control when faced with a temptation. More recent research using experience sampling methods (Hennecke et al., 2019), asked people to report on unpleasant activities that included a self-control element, as well as what spontaneous reactive strategies they used to boost self-control and perform the activity. The most frequently mentioned activities were studying (39%), watching a lecture (27%), and commuting (12%); there was no financial activity category. The researchers found that during the unpleasant activity, focusing on the positive outcomes of the activity (36% of participants spontaneously used it), thinking about how the activity is almost

completed (28% spontaneously used it), regulating one's emotions (15% spontaneously used it), and monitoring progress (12% spontaneously used it), were the most effective reactive strategies for increasing self-regulatory success. Considering there is evidence that both proactive and reactive strategies are effective, in the present research, I use the theoretical framework of distinguishing between proactive and reactive strategies when examining self-control strategies for financial goals.

Increasingly, research is examining how the role of using multiple strategies per self-control conflict influences how successful people are at resisting temptation – a concept known as polyregulation or strategy stacking (Ford et al., 2019; Hennecke & Bürgler, 2020; Werner & Ford, 2021; Williamson & Wilkowski, 2020). In a 10 day experience sampling study, researchers asked participants eight times a day whether they experienced a self-control conflict in the last hour; in 40% of the samples people experienced a recent temptation (Bürgler et al., 2020). Bürgler and colleagues (2020) found that self-control success was not solely determined by mastery of a single strategy, but by the ability to respond flexibly to a given temptation with a repertoire of self-control strategies. In a study assessing the effectiveness of self-control strategies on goal progress (39% academic goals, 31% health goals, 10% financial and career goals), Williamson and Wilkowski (2020) found that all the Process model self-control strategies were similarly effective and suggested the combined use of proactive (e.g., situation selection) and reactive (e.g., distraction) strategies might best support goal progress.

Any one of the strategies in the PI model and the Process model can be manifested in different ways. For example, engaging in cognitive change strategies might include goal setting, self-monitoring, planning, psychological distancing, or mindfulness (Duckworth et al., 2018). These different operationalizations of cognitive change may vary in effectiveness and may not be

applicable to all tempting situations. Constraints of specific situations may limit the range of possible options, and potentially the effectiveness, of certain strategies. Experience sampling research found people used on average 2.25 self-control strategies per situation (Hennecke et al., 2019) and people spontaneously use different strategies for different self-control situations (Milyavskaya et al., 2020). A reason why people vary not only the types of strategies they use, but also the number of strategies they use, per situation might be because some strategies may not suit some situations. For example, when shopping in a brick-and-mortar store, choosing to pay with cash as opposed to a credit card can be an effective reactive strategy because it limits spending to the amount of cash available; however, this strategy would not be applicable to online shopping situations. Additional situational factors, such as time, money, physical barriers, or social barriers, may be necessary to successfully use a strategy and resist a temptation. In the present research, when assessing effectiveness I examine sets of practical proactive or reactive strategies (as opposed to individual proactive and reactive strategies) to allow for flexible strategy use across diverse spending situations.

The self-control literature has focused more on academic goals (e.g., Ariely & Wertenbroch, 2002; Benedict & Hoag, 2004; Duckworth et al., 2019; Robinson et al., 2018; Schmitz & Perels, 2011) and health goals (e.g., Burke et al., 2011; David & Haws, 2016; Krishnamurthy & Prokopec, 2010; Milkman et al., 2014; Pearson, 2012) than financial goals (except under the umbrella of self-nominated personal goals, Fishbach & Hofmann, 2015; Hofmann et al., 2012; Williamson & Wilkowski, 2020). Some research estimates that financial goals account for approximately 23% of people's actively pursued goals (Davydenko et al., 2019). While there is a lot of similarity across goal domains, goal domains have also been shown to differ in terms of goal setting and pursuit (Milyavskaya et al., 2014; Milyavskaya & Werner,

2018), planning behaviour (Gollwitzer & Sheeran, 2006; Lynch Jr. et al., 2010), and trait self-control (de Ridder et al., 2012; Haws et al., 2012). Similarly, there might be unique self-control strategies that work especially well in the financial domain. Financial self-control might also differ from other domains of self-control, such as work or school, because a person's financial resources are limited and money as a resource is countable and storable (unlike effort or other self-control resources).

### *Other Academic Perspectives*

In addition to research focusing on self-control or self-control strategies, research on financial decision-making is also relevant to financial self-control. Research on financial decision-making spans disciplines from marketing, behavioural economics, and consumer research. Some of this research on financial decision-making is essentially studying self-control strategies. This research can contribute to the self-control literature even though it does not refer to self-control models or use the same terminology. Typically, these studies examined situational factors that decrease spending or increase saving by changing the situation or one's cognition – in other words, self-control strategies, even though the term is not usually used.

Several studies on financial decision-making found that changing the way a person thinks or behaves in a tempting situation (i.e., reactive self-control strategies) may help people make more goal-consistent decisions for the saving and spending goals (e.g., Keinan & Kivetz, 2008; Rudzinska-Wojciechowska, 2017). For example, researchers showed participants their own photos aged 40 years into the future and then asked them what they would do with a windfall of \$1,000: invest into a retirement fund, buy something nice, plan an event, or deposit it in a chequing account (Hershfield et al., 2011). Participants who saw the aged photo of themselves (compared to those who saw a current photo of themselves) were more likely to invest in the

retirement fund option and would forego current spending for the benefit of their future self. Researchers suggest that thinking of the future self helps make future oriented spending decisions (Bartels & Urminsky, 2015; Haws, 2016; Nenkov et al., 2014). Thus, thinking of the future self aligned (hypothetical) spending choices with spending goals and can be seen as equivalent to a self-control strategy. In the PI Model, this strategy could be integrated as an interventive strategy that boosts volitional self-control by changing how a person thinks about the temptation (Hofmann & Kotabe, 2012). In the Process model, thinking about your future self when encountering a temptation would be considered an intrapsychic strategy that uses cognitive change to reappraise the temptation to favour more goal-consistent decision-making (Duckworth et al., 2014).

Other studies found that changing what a person thinks or does in anticipation of a spending temptation may help people make more goal-consistent decisions for saving and spending goals (e.g., Somville & Vandewalle, 2018; Tam & Dholakia 2011). For example, through a second-bid sealed auction, MBA students were asked to report how much they were willing to pay for three separate prizes of tickets to a baseball game; the student with the second highest bid for each prize would actually purchase the tickets (Prelec & Simester, 2001). Those who were assigned to make their bids with the expectation of having to pay by credit card paid 59% to 113% more (i.e., a credit card premium) compared to those who expected to pay by cash if they won the prize. Although the students did not have a choice in payment method, in practice, paying with cash is a self-control strategy because it limits the amount of money a person can spend when tempted. In the PI model, this strategy could be integrated as a preventive strategy that creates opportunity constraints (i.e., limiting how much can spend by limiting available money) in anticipation of encountering a spending temptation (Hofmann & Kotabe,

2012). In the Process model, preparing to pay with cash would be considered a situational strategy that uses situation modification to limit how much a person can spend when tempted (Duckworth et al., 2014). In the present research, I consider this a proactive strategy because to use this strategy a person would need to withdraw cash from an ATM before they even encounter a spending situation where they are tempted to spend money.

Anticipating temptation can also be helpful in a saving context. In an experimental longitudinal study, Beshears and colleagues (2011) gave people \$50, \$100, or \$500 and asked them to divide the amount between a liquid account where they could take money from the account anytime and a commitment account with either a 10% early withdrawal penalty or no possibility for early withdrawal (i.e., people could not withdraw any of the money until a certain amount of time passed). The researchers found people placed more money into commitment accounts with no early withdrawal than the other types of accounts. In the PI model, depositing money into an account that is hard to access could be integrated as a preventive strategy that increases a person's motivation to control impulses by setting up commitment contracts (Hofmann & Kotabe, 2012). In the Process model, this strategy would be considered a situational strategy that uses situation selection to eliminate future tempting options (Duckworth et al., 2014).

In sum, there are several aspects of people's cognition and financial behaviour before they encounter spending temptations (i.e., proactive strategies) and their cognition and financial behaviour during spending temptations (i.e., reactive strategies) that can be seen as financial self-control strategies. In the first part of my dissertation, I aim to aggregate this interdisciplinary research that lies outside the realm of social psychology self-control research on the various ways a person can use cognition and behaviour to influence their financial decision-making. I

examine these previously studied ‘strategies’ in terms of whether they are employed proactively versus reactively, linking to the PI and Process models.

### *Non-Academic Perspectives*

Outside of academic research, self-control for financial goals is a popular topic. A quick Google search returns 648,000,000 results for “spend less money and self-control” and 778,000,000 results for “save more money and self-control”. Clearly, a variety of people are interested in learning about how to use self-control for financial goals and a variety of people have something to say about it. From financial advisors (e.g., Orman, 2019; Ramsey Solutions, 2020) to journalists (e.g., Adams, 2018; Wealthsimple, 2017) to bloggers (e.g., Morgan, 2018; Omololu, 2021), people dispense advice online for how to boost self-control to save more or spend less money. Although these recommendations are not usually based on empirical findings, this is the advice that most lay people find when looking for help with their self-control.

The way academics study a phenomenon may differ from the way people experience it in daily life. For example, for a long time, economists studied decision-making with the assumption that people are rational and overlooked how situational factors could influence people to make ‘irrational’ decisions (e.g., Ariely, 2008; "Econs" vs. humans, Thaler & Sunstein, 2009). In the goal literature, most academic studies on goals have focused on only one goal and rarely take into consideration what happens when people have multiple competing goals (e.g., at the grocery store deciding between expensive free-range eggs, omega-3 eggs in a plastic carton, or cheaper eggs from a large poultry farm when you have competing environmental, health, and financial goals). In terms of self-control strategies, some strategies may be easier to study in lab settings than others. For example, relying on your partner for self-control support may be a strategy in everyday life, but in the academic context, it would be difficult to design an experimental,

longitudinal, dyadic study to study the effect of this strategy on monthly spending. Therefore, in the present research, I examine not only the academic literature, but also the online media and lay people's reports, when identifying self-control strategies. This method also allows me to investigate how many of the self-control strategies studied in the academic literature are circulated in the media and are known by the public.

### **The Present Research**

The purpose of the present research is twofold: (1) to identify concrete self-control strategies for financial goals, (2) to determine the effectiveness of proactive versus reactive self-control strategies for financial goals. In the first part of this dissertation, I examined academic, media, and lay person perspectives on financial self-control strategies. I identified empirically studied financial self-control strategies through a formal meta-analysis. To my knowledge, this is the first meta-analysis of research on self-control strategy use for financial goals. This analysis included research from psychology, marketing, and economics disciplines. The objectives of the meta-analysis were to collate financial self-control strategies, to examine overall effect sizes, and to examine two possible moderators of effect sizes: whether the strategies were designed to increase saving or reduce spending and whether the strategies could be used proactively or reactively. Next, I examined self-control strategies promoted in online media (Study 1), which included the perspective of other experts on financial self-control strategies outside of academia (i.e., financial advisors, banks, financial organizations). Finally, I examined the self-control strategies lay people described using in their daily life (Study 2). I did not make hypotheses before conducting the meta-analysis or before examining media and lay strategies because the research was descriptive in nature. The purpose of these studies was to create a comprehensive

understanding of the financial self-control strategies studied in the literature and those promoted and used by people outside academic research.

In the second part of this dissertation, I examined the effectiveness of proactive and reactive financial self-control strategies. According to the PI and Process models, strategies used earlier in the self-control cycle should be more effective (Duckworth et al., 2016; Hofmann & Kotabe, 2012). For a sample of lay people, I highlighted several proactive and reactive strategies, respectively, and compared participants' spending over the course of a month with a control group. Participants were informed of proactive and reactive strategies identified in earlier studies (Study 3) or were asked participants to describe the proactive versus reactive strategies, respectively, they themselves currently use (Study 4). Both studies assessed spending goals at the first day of a month and actual spending on the last day of the month, and daily spending was sampled throughout the month.

### **Meta-Analysis of Financial Self-Control Strategies**

I conducted a formal meta-analysis of the existing literature about empirically tested self-control strategies in the financial domain. A meta-analysis goes beyond a literature review by following more formal rules in literature selection and by synthesizing the statistical results of the reviewed studies to determine the overall effect of an intervention (Borenstein et al., 2009). I collected experimental studies based on adult samples that compared a self-control strategy to a control treatment and measured saving or spending as an outcome. This meta-analysis aimed to provide an overview of the current state of the research but also provided an initial estimate of the effectiveness of financial self-control strategies. I examined whether effect sizes of the studies differed by outcome behaviour (i.e., saving vs. spending) and by type of strategy (i.e., proactive vs. reactive strategies). According to the PI and Process models, proactive strategies

should generally be more effective than reactive strategies because proactive strategies remove or restrict temptations from situations likely to be tempting, thereby reducing the need to engage in self-control (Duckworth et al., 2014; Hofmann et al., 2012). I had no expectations for differences in effectiveness between strategies used for increasing saving or decreasing spending.

## **Method**

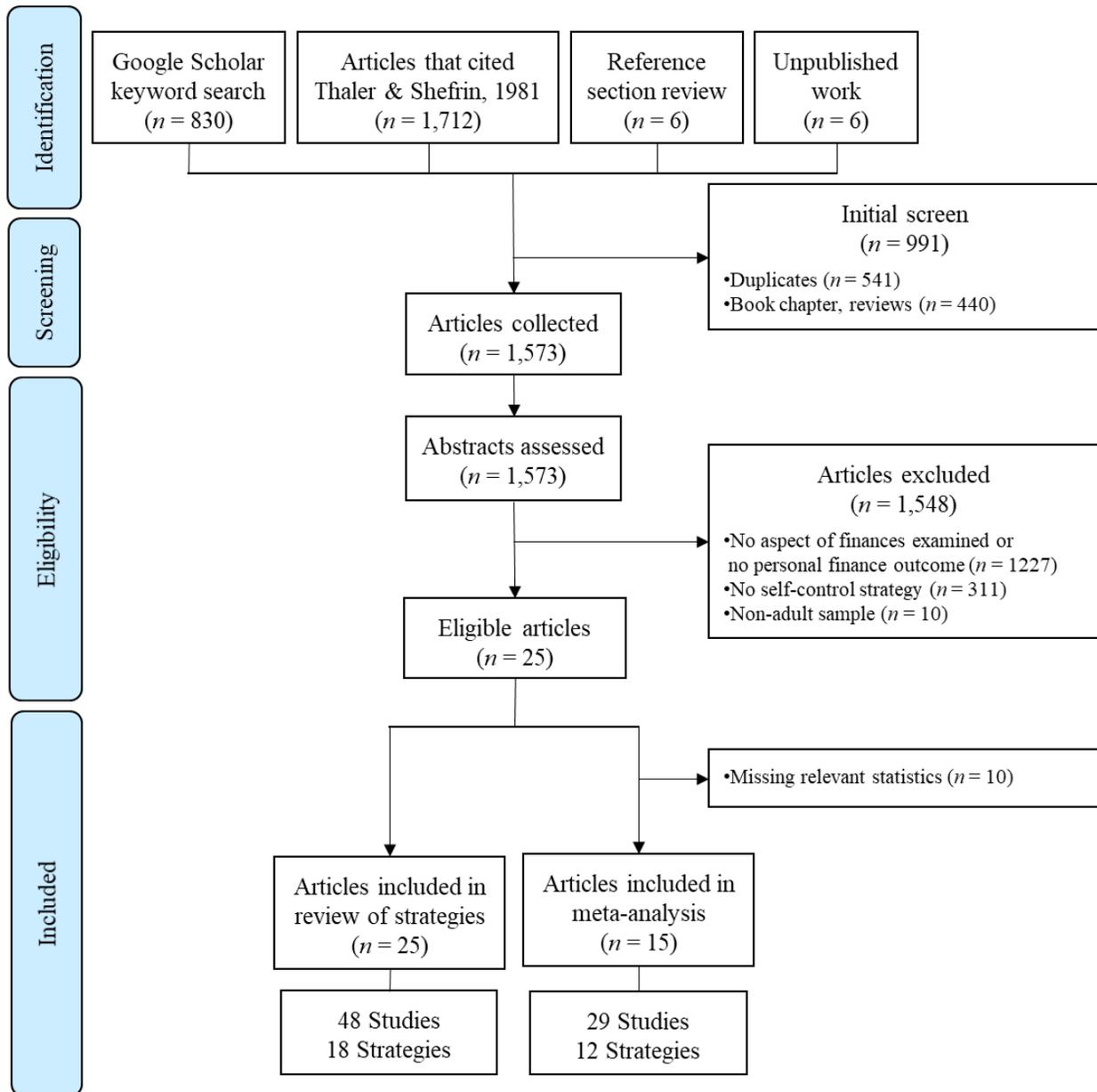
### ***Step 1: Identification Process***

In a first step of the literature search, I searched relevant databases, including PsycInfo, SAGE Journals Online, Wiley Online Journals, and ProQuest via the meta-search engine Google Scholar, for articles of any type (i.e., published, dissertation, grey papers, pre-prints) that matched these search terms: “allintitle: “saving decisions”, “allintitle: “saving behavior”, “allintitle: “personal saving”, “allintitle: “spending decisions”, “allintitle: “spending behavior”, “allintitle: “personal spending”. The search keywords were broad and encompassed many irrelevant articles since the words “saving” and “behaviour” and “decisions” can be used in many different contexts (e.g., life saving, spending time). I opted to use broad rather than narrow keywords because the purpose of this search was to gather as many types of self-control strategies as possible. I did not use the keyword “self-control strategies” in the search because it is not widely used outside psychology research, and the keyword could miss relevant studies that examined strategies without explicitly using the term. There were no date constraints on the search, but the search parameters were constrained to articles in English. In a second step, I examined those papers who cited a hallmark paper: “The economic theory of self-control” by Thaler and Shefrin (1981). This seminal paper brought attention to the concept of self-control in the economic literature and introduced more research from the economics discipline into the present meta-analysis. I presumed subsequent articles on the topic would likely cite this paper.

At the time of the meta-analysis search, this article was cited 1,712 times in English articles. In a third step, I screened the reference sections of articles identified in the search for other potential articles not found via the first two steps. In a final step, I put out a call for unpublished papers on several listserv platforms (i.e., Society of Personality and Social Psychology, European Association for Social Psychology, Society for Judgment and Decision Making) requesting researchers to send any unpublished or in-press work they may have on financial self-control strategies. The search for relevant research was initially conducted in July 2018 and updated in July 2020. Figure 1 depicts the flow of the search and screening process and the number of articles found in each of the steps of the article identification process.

**Figure 1**

*Flow Diagram of Meta-Analysis Screening Process*



***Step 2: Screening Process***

I excluded duplicates, non-empirical articles (e.g., review articles, book chapters). A total of 1,573 potential texts were identified.

***Step 3: Eligibility Coding***

Next, I evaluated the abstracts for eligibility on three criteria. When coding for eligibility, coding stopped once an article was deemed ineligible according to any one of the criteria. First, an article was eligible if it examined individual-level spending or saving. I excluded those articles that did not assess spending or saving outcomes (e.g., research on stocks, dividends, non-finance related outcomes) and those that did not assess *individual-level* spending outcomes (e.g., research on spending or saving at the household, organizational, or country level). Second, an article was deemed eligible if it examined self-control strategies as a predictor variable. I excluded articles treating the use of self-control strategies as an outcome variable (e.g., relationship between individual differences and strategy use) and excluded articles that examined ways to reduce spending or increase saving outside a person's control (e.g., defaults set up by employers). Third, I excluded research conducted with children or adolescents. A second coder screened a random sample of 200 abstracts. Interrater reliability for article inclusion was strong (98% agreement) and significant,  $\kappa = .84$  (95% CI [.68, .99]),  $p < .001$  (Landis & Koch, 1977; McHugh, 2012).

***Step 4: Included Articles***

A total of 25 articles were deemed eligible. These articles outlined 18 distinct financial self-control strategies. Several were proactive strategies that focused on what people can do before they encounter a tempting situation: using a saving projection plan (Fajnzylber & Reyes, 2015), tracking weekly saving deposits (Akbas et al., 2016), automatizing saving (Bronchetti et

al., 2011; Rabinovich & Webley, 2007), using a saving account with no early withdrawals (Beshears et al., 2011), setting specific goals (Tam & Dholakia 2011; Ülkümen & Cheema 2011), keeping money in an account rather than in cash (Somville & Vandewalle, 2018), keeping budgets (Cheema & Soman, 2006; Pennings et al., 2005; Sheehan & Van Ittersum, 2018), making the saving goal personally meaningful (e.g., by decorating piggy banks, De Francisco et al., 2014), and planning purchases with a shopping list (Davydenko & Peetz, 2020). Several were reactive strategies that focused on what people can do during a tempting situation: imagining one's future self (Ersner-Hershfield et al., 2009, 2011), considering reasons for the goal (Rudzinska-Wojciechowska, 2017), keeping cash in large denomination (Raghubir & Srivastava, 2009) or in bills rather than coins (Tessari et al., 2011), paying cash only (Helion & Gilovich, 2014; Prelec & Simester, 2001; Raghubir & Srivastava, 2008), tracking expenses via text messages (Hernández Escuer et al., 2014), avoiding financing options (Wertenbroch et al., 2001), remembering your account balance before thinking about a future purchase (Cheema & Soman, 2006), and anticipating regret over purchases (Keinan & Kivetz, 2008). Using coupons was the only self-control strategy that *increased* spending (Milkman & Beshears, 2009). Among these 25 articles, 12 (48%) used the word “self-control” and only three (12%) used the term “self-control strategies” in the text. Among these 18 strategies, there was an even split between proactive ( $n = 9$ ) and reactive ( $n = 9$ ) strategies, and an even split between strategies used for saving ( $n = 9$ ) and strategies used for spending ( $n = 9$ ).

However, for several of these articles the necessary meta-analysis statistics were not reported in the article (and could not be obtained by contacting the authors). To be included in the meta-analysis, the articles needed to report at least one of the appropriate statistics needed to compute the effect size (i.e.,  $M$  and  $SD$  or  $t$ , or  $F$ ), as well as the total sample size and the sample

size per condition. From these reported statistics, I computed Cohen's  $d$  for each study using online calculators (Lenhard & Lenhard, 2016; Wilson, 2001) based on the difference in means between the strategy and control group (Lenhard & Lenhard 2017; Suurmond et al., 2017). In the case of repeated measure study designs, only the first post-test measurement was used for analysis to allow for meaningful comparison with independent-group study designs that reported only one measurement after the strategy intervention. By including only one effect size from each study, I prevented having the same participant represented in more than one effect size estimate. Thus, the meta-analysis of effect sizes is based on 15 articles with a total of 29 studies testing 12 unique self-control strategies (see Table 1). See Appendix A for the meta-analysis coding guide, data, and PRISMA checklist (Page et al., 2021).

### ***Coding Guide***

Next, these 29 studies were coded for study design, sample, intervention, and outcome characteristics, as well as within study bias coding. *Study design characteristics* included the publication year, country of research, publication status (peer-reviewed published, thesis/dissertation, unpublished), and data collection method (online, in-lab, in-person outside of lab). *Sample characteristics* included the type of sample pool (university students, community), mean age, and the percentage of female to male participants. *Intervention characteristics* included the strategy used (tracking, make money hard to access, withdrawal penalty, planning, payment method, future self, budget, construal focus, denomination effects), strategy type (proactive, reactive), and control group instructions. *Outcome characteristics* were coded for the outcome type (saving, spending). Other types of characteristics that were coded but not used in the analysis are available in the coding guide in Appendix A.

As with any meta-analysis, the conclusions drawn from this meta-analysis are restricted to the methodological rigor of the included studies. I coded individual studies included in this meta-analysis for systematic differences between the conditions for selection bias (random sequence generation and allocation concealment), performance bias, detection bias, attrition bias, and selective reporting bias. Random sequence generation refers to whether participants were assigned to conditions using non-random (high risk) or random (low risk) approaches. Allocation concealment refers to whether participants and researchers could foresee (high risk) or could not foresee (low risk) into which condition an upcoming participant would be assigned. Performance bias refers to whether participants and researchers knew (high risk) or did not know (low risk) which participants received which intervention. Detection bias refers to whether the participants knew (high risk) or did not know (low risk) the study's outcome of interest. Attrition bias refers to whether conditions differed (high risk) or did not differ (low risk) in the amount, nature, or handling of incomplete outcome data. Selective reporting bias refers to whether reported findings differed (high risk) or did not differ (low risk) from unreported findings. Two coders (i.e., myself and an additional rater) rated each study as high risk, low risk, or unclear risk of bias (see Table 8.5.c in Higgins et al., 2019 for risk assessment tool used). For the selective reporting bias coding, Higgins and colleagues (2019) forewarn that it is likely that most studies will fall under "unclear risk". Overall, there was moderate to strong agreement ( $\kappa$  range = .65 to 1.00; McHugh, 2012) between the coders with 93.1% to 100% agreement in ratings.

**Table 1***Studies Included in the Meta-Analysis in Order of Effect Size*

Study	Strategy Description	Strategy condition (vs. control condition)
1 Raghbir & Srivastava, 2009 (s1a)	Keep cash in large denomination	Pay with 1 x \$1 bill (vs. 4 x \$0.25 coins)
2 Fajnzylber & Reyes, 2015	Use a saving projection plan	See personalized retirement saving projection statement (vs. not)
3 Davydenko & Peetz, 2020 (s1)	Write a shopping list	Write a shopping list (vs. not)
4 Rudzinska-Wojciechowska, 2017 (s2)	Think about reason for goal	Adopt abstract mindset (vs. concrete mindset)
5 Prelec & Simester, 2001 (s2)	Pay cash only	Pay with cash (vs. credit card)
6 Akbaş et al., 2016	Track account	Track weekly saving deposits (vs. weekly text message reminders)
7 Davydenko & Peetz, 2020 (s2)	Write a shopping list	Write a shopping list (vs. not)
8 Beshears et al., 2011 (s2)	No early withdrawals	Use saving account with no early withdrawal (vs. early withdrawal penalty)
9 Sheehan & Van Ittersum, 2018 (s4)	Have a budget	Shopping with a budget (vs. without a budget)
10 Raghbir & Srivastava, 2009 (s1c)	Keep cash in large denomination	Pay with 1 large bill (vs. 5 smaller denomination bills)
11 Hernández Escuer et al., 2014	Track account	Receive text messages listing each expenditure (vs. not)
12 Helion & Gilovich, 2014 (s2)	Pay cash only	Pay with cash (vs. gift card)
13 Raghbir & Srivastava, 2009 (s1b)	Keep cash in large denomination	Pay with 1 x \$5 bill (vs. 5 x \$1 bill)
14 Hershfield et al., 2011 (s1)	Imagine future self	See photo of self aged to 70 years old (vs. unaltered photo)
15 Beshears et al., 2011 (s1)	No early withdrawals	Use saving account with no early withdrawal (vs. early withdrawal penalty)
16 Raghbir & Srivastava, 2008 (s3)	Pay cash only	Pay with cash (vs. gift card)
17 Raghbir & Srivastava, 2008 (s2)	Pay cash only	Pay with cash (vs. credit card)
18 Tam & Dholakia, 2008 (s1)	Make goal specific	Set saving goal for a specific future month (vs. next month)
19 Raghbir & Srivastava, 2008 (s4)	Pay cash only	Pay with cash (vs. gift card)
20 Prelec & Simester, 2001 (s1)	Pay cash only	Pay with cash (vs. credit card)
21 Tam & Dholakia, 2008 (s3)	Make goal specific	Set saving goal for a specific future month (vs. next month)
22 Rudzinska-Wojciechowska, 2017 (s3)	Think about reason for goal	Think about why saving money (vs. think about how to save money)
23 Hershfield et al., 2011 (s3a)	Imagine future self	See aged avatar of current self (vs. unaltered avatar of current self)
24 Tessari et al., 2011 (s3)	Keep cash in bills	Pay with fake currency banknotes (vs. fake currency coins)
25 Tessari et al., 2011 (s1a)	Keep cash in bills	Pay with fake €1 banknotes (vs. fake €1 coins)
26 Tessari et al., 2011 (s1b)	Keep cash in bills	Pay with fake €1 banknotes (vs. fake €1 coins)
27 Tessari et al., 2011 (s2)	Keep cash in bills	Pay with real \$1 banknotes (vs. real \$1 coins)
28 Somville & Vandewalle, 2018	Make money hard to access	Keep money in a bank account (vs. keep it in cash)
29 Tam & Dholakia, 2008 (s5)	Make goal specific	Set saving goal for a specific future month (vs. future quarter)

## Results

### *Descriptive Information of the Studies and Samples*

The majority of the studies were published articles in peer-reviewed journals (75.9%), conducted in the U.S. (53.6%), and recruited university student samples (65.5%). Most studies (77.8%) were conducted in person (in-lab:  $n = 18$ , in-person outside of lab:  $n = 5$ , online:  $n = 6$ ). Across all studies, a total of 12,316 participants were recruited ( $M_{\text{age}} = 26.6$  and 65.2% of studies had a roughly equal gender distribution) with 9,192 participants in the strategy conditions and 3,124 in the control conditions. The sample size of studies varied widely, from 24 to 8,940 participants. The year of publication ranged from 2001 to 2020, and 65.5% ( $n = 19$ ) of the studies were published before 2012 – before the replication crisis<sup>1</sup> in social psychology (Open Science Collaboration, 2012).

### *Overall Effect Size of Strategy Use*

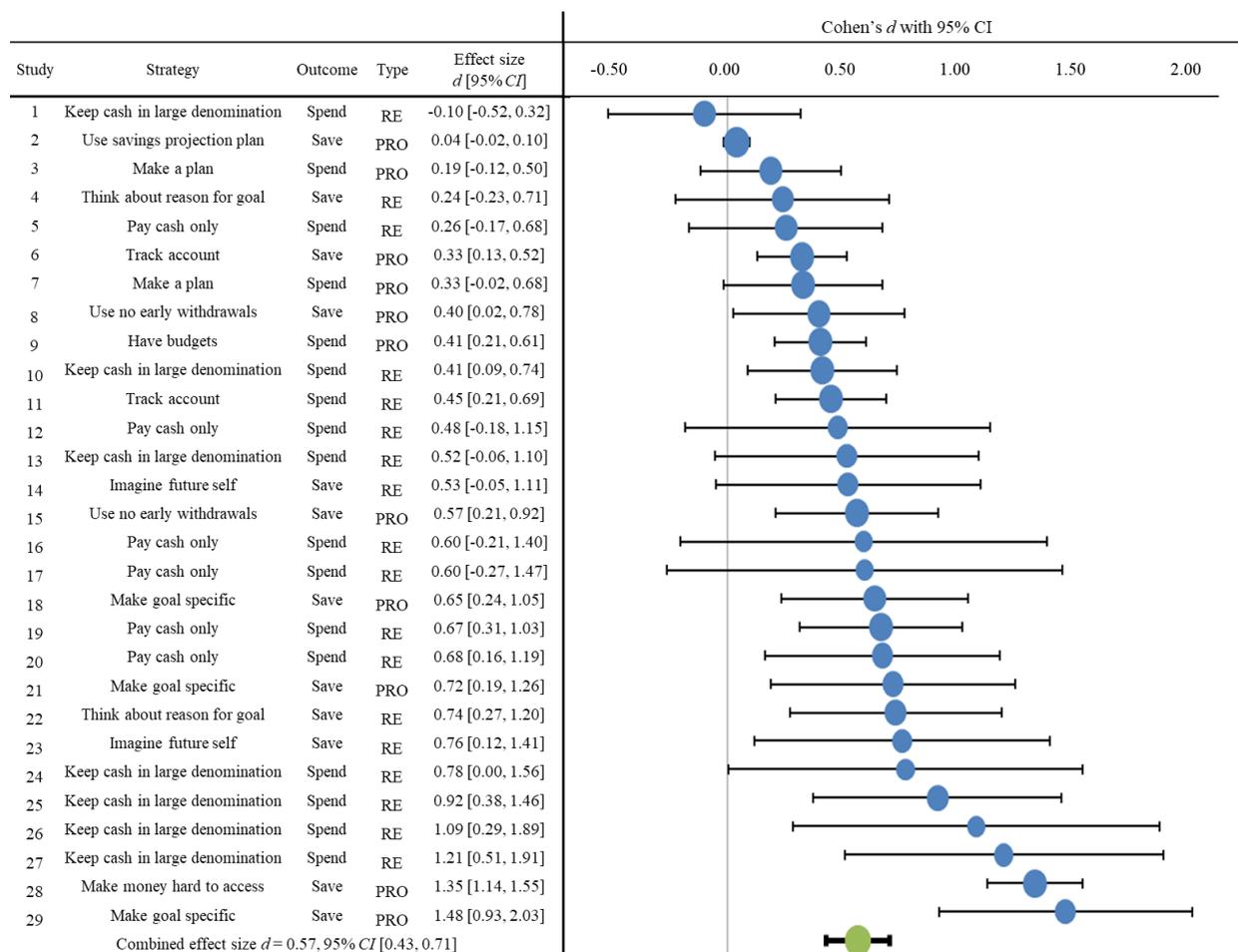
I used the Meta-Essentials workbook designed by Erasmus Research Institute of Management (Suurmond et al., 2017) to compute an effect size (Cohen's  $d$ ) for each study. According to Cohen (1992),  $d = 0.20$  is a small effect,  $d = 0.50$  is a medium effect, and  $d \geq 0.80$  is a large effect. I used an online calculator to compute effect sizes for those studies that reported only  $t$  or  $F$  statistics (Lenhard & Lenhard, 2016). All studies were coded such that the effect reported was in the direction of lower spending or higher saving, respectively. In all analyses reported below I used a random effects model due to the variety of self-control strategies examined and methodologies used across the studies. See Figure 2 for a forest plot.

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<sup>1</sup> The replication crisis began in the 2010s when social psychologists became increasingly concerned about the replicability of the field's published results, which resulted in changes to the common research (e.g., preregistering study design and analysis techniques prior to data collection) and publication (e.g., sharing study materials and data online) practices in the field.

**Figure 2**

*Forest Plot of Strategy Effect Size by Study*



*Note.* Each line represents one study. The position of the bubble depicts the effect size. The size of the bubble represents the weight of that individual study on the overall average effect size, whereby studies with larger sample sizes are weighed more and are represented with larger bubbles. The bubble at the bottom of the plot represents the weighted combined effect size. The bars represent the 95% confidence interval. Outcome refers to whether the purpose of the strategy is to reduce spending (Spend) or increase saving (Save). Type refers to whether the strategy is proactive (PRO) or reactive (RE). Refer to Table 1 for article and strategy details.

The average effect size of financial self-control strategies was 0.57 with a 95% confidence interval from 0.43 to 0.71 ( $Z = 8.38, p < .001$ ). In other words, on average, instructing participants to employ a financial self-control strategy significantly reduced spending or increased saving with a medium effect size (Cohen, 1992). Such an effect size is slightly larger than the average effect sizes ( $d = 0.39$  to  $0.43$ ) found in social psychology (Gignac & Szodorai, 2016; Richard et al., 2003). Examining the forest plot revealed there were no effect size outliers. However, there was one study (study #2, Fajnzylber & Reyes, 2015) that was a sample size outlier and due to its large sample size ( $n = 8940$ ) was weighted most heavily in the calculation of the overall effect size. Sensitivity analyses showed that excluding this study from the meta-analysis did not change the combined effect size ( $d = 0.59, 95\% \text{ CI } [0.45, 0.73], Z = 8.75, p < .001$ ). Of the 29 studies, 11 had effect size confidence intervals that included zero, suggesting the strategy did not significantly influence saving or spending.

### ***Homogeneity of Effect Sizes***

Next, I examined the variability in effect sizes. Cochran's  $Q$  statistic is a test of the total amount of observed heterogeneity (Borenstein et al., 2009; Cochran, 1954), whereby a significant  $Q$  statistic suggests the effect sizes are heterogeneous and supports the use of moderator analysis to explore the source of the variability in effect sizes. The homogeneity test of the overall effect size was significant ( $Q = 241.68, df = 28, p < .001$ ), indicating that there was significant heterogeneity in effect sizes and that the observed variation in study effect sizes was larger than would be expected from mere sampling error. The  $I^2$  is the ratio of true heterogeneity to total observed variation and it reflects how much the effect size confidence intervals overlap across the studies (Borenstein et al., 2009). The proportion of total variation due to heterogeneity between studies was large ( $I^2 = 88.4\%$ ; Higgins & Thompson, 2002), suggesting the variability

in effect sizes is due to heterogeneity rather than sampling error. This heterogeneity suggests other factors may need to be accounted for in order to explain the variability of the true effect sizes (e.g., moderators) and confirms the random effects model approach.

### ***Moderator Analysis***

Considering the significant heterogeneity in effect sizes, I conducted moderator analyses to examine whether the variability in effect sizes can be attributed to the strategy type (i.e., proactive vs. reactive strategies) or outcome type (i.e., increasing saving vs. decreasing spending). The PI and Process models would suggest that proactive strategies are more effective than reactive strategies for reducing spending and increasing saving. I used the Meta-Essentials workbook to conduct the moderator analyses (Suurmond et al., 2017) through meta-regression (Thompson & Higgins, 2002).

Across all included studies, 11 (37.9%) examined proactive strategies, and 18 (62.1%) examined reactive strategies. A meta-regression revealed that strategy type was not a significant predictor of effect size ( $\beta = 0.02$ ,  $B = 0.01$ ,  $SE = 0.18$ ,  $F(1, 27) = 0.01$ ,  $p = .930$ ). Strategy type explained only 0.03% of the variance in the overall effect size. Contrary to self-control models, proactive and reactive strategies were similarly effective at reducing spending or increasing saving. The combined effect size for proactive strategies ( $d = 0.56$ , 95% CI [0.30, 0.83]) was not significantly larger than the combined effect size for reactive strategies ( $d = 0.58$ , 95% CI [0.43, 0.72]). The effect size confidence interval for proactive strategies is larger than the confidence interval for reactive strategies, suggesting there is greater variability in effect sizes for studies that assessed proactive strategies.

Across all included studies, 12 (41.4%) examined saving as outcome, and 17 (58.6%) examined spending reduction as outcome. A meta-regression revealed that outcome type was not

a significant predictor of effect size ( $\beta = 0.15$ ,  $B = 0.11$ ,  $SE = 0.19$ ,  $F(1, 27) = 0.63$ ,  $p = .435$ ).

Outcome type explained only 2.27% of the variance in the overall effect size. The combined effect size for self-control strategies used to increase saving behaviour ( $d = 0.63$ , 95% CI [0.39, 0.88]) was similar to the combined effect size for self-control strategies used to decrease spending behaviour ( $d = 0.52$ , 95% CI [0.37, 0.68]). The effect size confidence interval for saving is larger than the confidence interval for spending, suggesting there is greater variability in effect sizes for studies that measured the effect of strategy use on saving. This moderator analysis suggests financial self-control strategies are similarly effective whether they are used before or during a spending temptation and whether they are for reducing spending or increasing saving.

### ***Within-Study Bias***

The majority of studies included in the meta-analysis were low in risk for selection bias (i.e., groups were randomly assigned), performance bias (i.e., participants and researchers did not know which participants were in which group), and detection bias (i.e., participants did not know the main outcome). There were only three studies that showed high risk of bias across all biases coded. It was difficult to assess attrition bias and selective reporting bias because of insufficient information, such as no reasons for missing data were stated or the study protocol was not available; therefore these types of bias were mostly coded as “unclear risk”. Unclear risk of selective reporting bias was excepted (Higgins et al., 2019), especially considering most of the studies were conducted before open science practices (e.g., preregistration – when researchers outline their hypotheses, methods, and analyses before collecting data; van’t Veer & Giner-Sorolla, 2016) were more widely accepted. See Table 2 for the breakdown by bias and risk

category. Due to the lack of heterogeneity in risk of bias ratings for the included studies, I did not examine within study bias as a moderator of overall effect size.

**Table 2**

*Frequency Table of Within Study Risk of Bias in the Meta-Analysis*

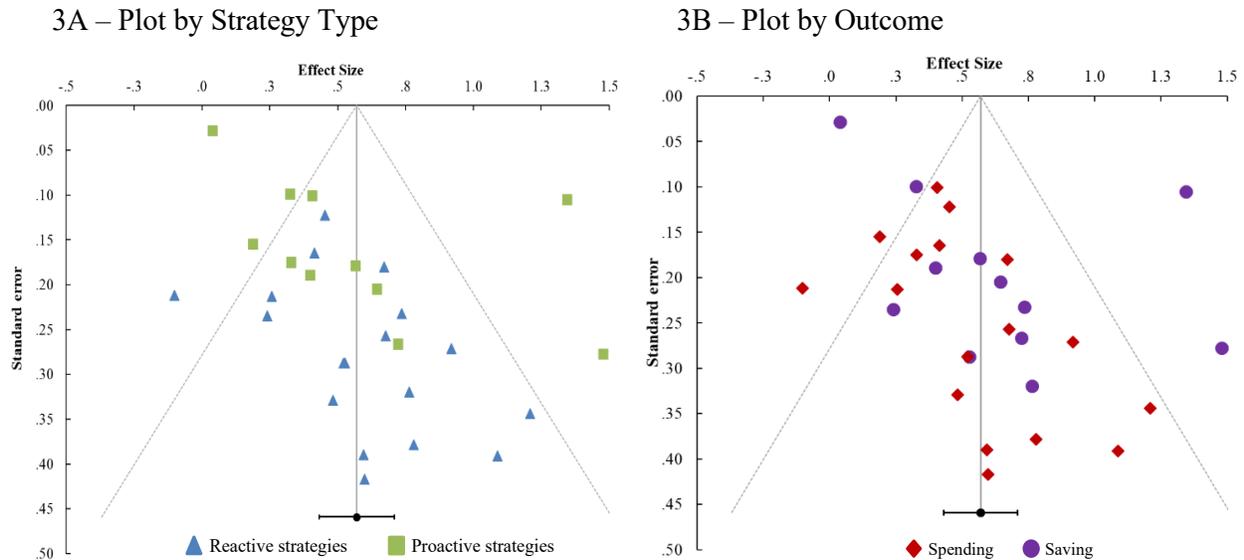
Type of bias	Risk of bias ( $k = 29$ ) $n$ (%)			Inter-rater reliability $\kappa$ ( $SE$ )	Agreement between coders
	Low risk	High risk	Unclear risk		
Selection bias in random sequence generation	26 (89.7)	1 (3.4)	2 (6.9)	.84 (0.15)	96.6%
Selection bias in allocation concealment	27 (93.1)	0	2 (6.9)	.65 (0.32)	96.6%
Performance bias	29 (100)	0	0	1.00	100%
Detection bias	28 (96.6)	1 (3.4)	0	.66 (0.32)	96.6%
Attrition bias	9 (31.0)	1 (3.4)	19 (65.5)	.85 (0.10)	93.1%
Selective reporting bias	3 (10.3)	0	26 (89.7)	.84 (0.16)	96.6%

*Note.*  $\kappa$  represents Cohen's kappa.  $\kappa$  values of .60 to .79 suggest moderate agreement and  $\kappa$  values of .80 to .90 suggest strong agreement between raters (McHugh, 2012).

### ***Publication Bias***

I examined whether the effect sizes included in the meta-analysis were biased due to a lack of published studies with small or null effects using a funnel plot. A funnel plot displays an individual study's effect size and standard error. Studies with large sample sizes have smaller standard errors, cluster around the overall effect size, and are plotted higher in the funnel plot. Meanwhile, studies with smaller sample sizes have larger standard errors, are spread widely around the overall effect size, and are plotted lower in the funnel plot. In the absence of publication bias, the individual study effect sizes are symmetrically distributed around the

overall effect size and resemble a funnel shape. In the presence of publication bias, the distribution is asymmetrical with studies missing at the bottom of the plot. A funnel plot (Figure 3) of the studies included in this meta-analysis reveals signs of publication bias. The bottom of the funnel plot shows an asymmetrical pattern, specifically there are more published studies with effect sizes greater than the overall effect size (i.e., to the right of the overall effect size) than studies with effect sizes less than the overall effect size (i.e., to the left of the overall effect size). Such a distribution suggests that studies which found small or null effects are missing from the published literature. The limited number of studies with small effect sizes may also suggest there is a lack of highly powered studies because large sample sizes are required to find significant small effect sizes. Although this funnel plot is suggestive of a publication bias, visual examination of a funnel plot is too subjective to provide conclusive evidence (Terrin et al., 2005) and there are other reasons why a funnel plot may be asymmetrical other than publication bias (e.g., heterogeneity of results; Sterne et al., 2005).

**Figure 3***Funnel Plot of Individual Study Effect Sizes and Standard Errors*

*Note.* The vertical line represents the overall effect size ( $d = 0.56$ ) with the dashed diagonal lines representing the 95% confidence interval. The dot at the bottom of the plots represents the overall effect size with the 95% confidence interval.

Considering the large between study heterogeneity ( $I^2 = 88.4\%$ ), I examined how strategy type (proactive, reactive) and strategy outcome (saving, spending) was represented in the funnel plot. The funnel plot comparing strategy type (Figure 3A) shows that studies that examined reactive strategies had generally larger standard errors (i.e., there are more reactive than proactive strategy studies in the bottom half of the plot) and found generally larger effect sizes (i.e., there are more reactive than proactive strategy studies to the right of the overall effect size). This is indicative of the small-study effect, the tendency for smaller studies to find larger effect sizes (Sterne et al., 2005). This may suggest that there is greater publication bias in studies that published about reactive strategies because there are fewer high-powered studies on reactive strategies that found small effect sizes. The funnel plots reveal studies that examined proactive

strategies (Figure 3A) or assessed saving (Figure 3B) show greater variability in effect size, visually depicting the greater range of the effect size confidence intervals for proactive (vs. reactive) strategies and saving (vs. spending). The comparison by strategy type and outcome shows that it may be misleading to ignore between study heterogeneity when assessing publication bias (Peters et al., 2010).

Considering this meta-analysis consisted of more than 10 studies and the studies varied in sample size (Sterne & Egger, 2005), I also conducted an Egger's regression to examine whether there is a significant linear relationship between the effect sizes and the standard errors which would suggest publication bias (Egger et al., 1997). The Egger's regression was significant ( $B = -0.92$ ,  $SE = 0.48$ ,  $t(23) = 3.12$ ,  $p = .005$ ), supporting the presence of publication bias.

I conducted Rosenthal's and Orwin's *Fail-safe N* tests to determine the impact of publication bias on the meta-analysis findings. Rosenthal's *Fail-safe N* examines how many more studies with null effects would be needed to make the overall effect size not significant (Rosenthal, 1979). Orwin's *Fail-safe N* estimates how many more fail safe studies are needed to result in a non-zero overall effect size, whereby the researcher chooses the smallest effect size of interest and the average effect size found in each fail safe study (Orwin, 1983). In the current meta-analysis, Rosenthal's *Fail-safe N* suggests 2,385 studies with null effects are needed before the overall effect size becomes not significant. Orwin's *Fail-safe N* shows 54 studies with a null effect are needed to lower the overall effect size found from a medium ( $d = 0.57$ ) to a small ( $d = 0.20$ ) effect (Cohen, 1992). This would suggest that the overall effect size found may be inflated due to publication bias if the addition of 50 small effect studies could lower the overall effect size from a medium to small effect. These *Fail-safe N* tests should be interpreted with caution because *Fail-safe N* are a measure of the tolerance of the overall effect size to additional null

results (i.e., how many more null results are needed before the overall effect size is not significant) rather than a measure of the file drawer problem (i.e., how many null results are hidden in the literature).

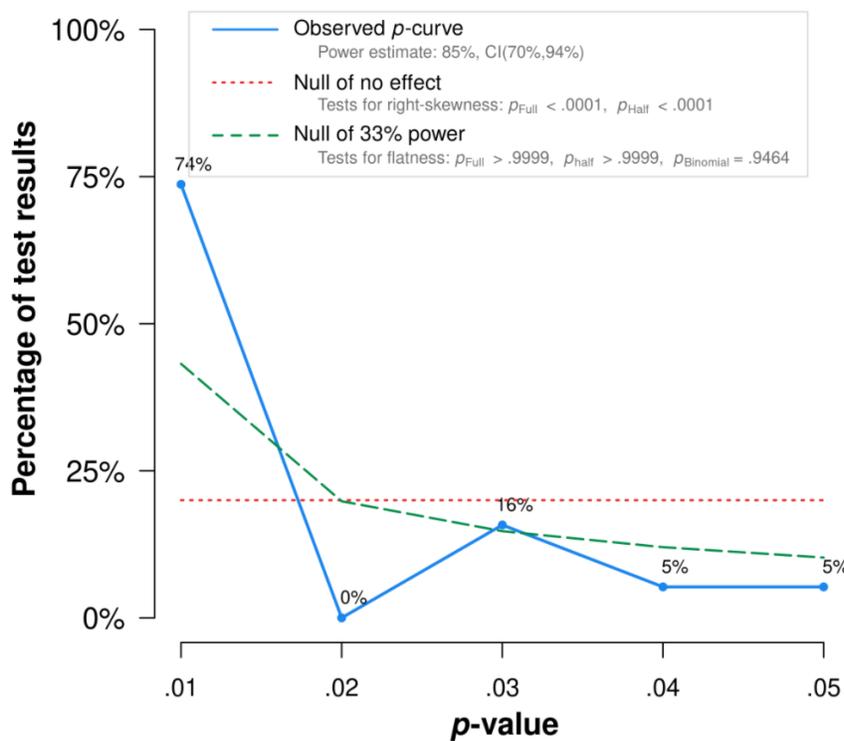
### ***P-curve***

The *p*-curve examines whether a research area or topic has high publication bias and whether there are high rates of *p*-hacking (Simonsohn et al., 2014, 2015). *P*-hacking occurs when researchers use questionable research practices (e.g., excluding conditions and/or studies that did not produce significant results, using questionable covariates, analyzing data during data collection; Lindsay, 2015) as a way to lower the *p*-value until it reaches significance (e.g., below the  $p < .05$  benchmark often needed for the research to be publishable). The *p*-curve creates a distribution of *p*-values from a collection of independent studies to show whether the research examined has evidential value (i.e., the significant results are likely due to true underlying effects rather than selective reporting). The *p*-curve has evidential value when there are more low (e.g.,  $p < .01$ ) than high (e.g.,  $p < .04$ ) *p*-values, generating a positive skew in the *p*-curve. The creators of the *p*-curve argue that high *p*-values that hover around the  $p < .05$  benchmark raise suspicion and are more likely to be the result of *p*-hacking than lower *p*-values. Distributions that do not have a positive skew lack evidential value. *P*-curve distributions that have a negative skew, with more high than low *p*-values, suggest intense *p*-hacking. Using the test results reported in the studies included in the meta-analysis, I generated a *p*-curve using the latest version of the online *P*-curve App 4.06 (Simonsohn et al., 2014; <http://www.p-curve.com/>). From the 29 studies in the meta-analysis, the *p*-curve included 19 statistically significant results at  $p < .05$ , of which 16 were  $p < .025$ . The *p*-curve showed there was a significant positive skew (binomial test  $p = .002$ ) with more low than high *p*-values, suggesting evidential value (i.e., the significant results are

likely due to true underlying effects). The estimated statistical power of tests included in the  $p$ -curve is 85% with a 90% confidence interval of 70% to 94% power. Therefore, although the funnel plot suggested that there was publication bias among the studies in the meta-analysis, the  $p$ -curve suggested that the published findings have evidential value.

**Figure 4**

*P-Curve Distribution of P-Values Included in the Meta-Analysis*



**Discussion**

As the first systematic review of literature on financial self-control strategies, this study aggregated 18 self-control strategies and compared effect sizes for 12 strategies for which effect sizes could be obtained. A formal meta-analysis showed that in these experimental tests, self-control strategies effectively reduced spending or increased saving (89.7% of studies found at

least a small effect size,  $d \geq 0.20$ ; 58.6% of studies found at least a medium effect size,  $d \geq 0.50$ ; Cohen, 1992). Given the presence of publication bias, it is of course possible that other strategies have been tested experimentally but shown a small, null, or negative effect, or that the overall effect size of self-control strategies on financial behaviour is actually lower than this published research suggests (Chandon, 2020; Open Science Collaboration, 2015; Franco et al., 2016). A meta-analysis of field experiments on the effectiveness of nudges compared academic research and research outside of academia (in government and organizations); the researchers found the reported effectiveness of nudges was larger in academic research ( $d = 0.28$ ) than in research outside of academia ( $d = 0.15$ , DellaVigna & Linos, 2020). The conclusions drawn from this meta-analysis on the effectiveness of financial self-control strategies are restricted to the methodological quality and rigor of the included studies. The addition of more field studies or more unpublished studies may change the overall effect size found in this meta-analysis. Across the included papers, however, this meta-analysis shows that there are concrete and effective financial self-control strategies people may use to increase financial goal-adherence.

Drawing from self-control models (Duckworth et al., 2014; Gross, 1998; Hofmann & Kotabe, 2012), I also categorized the strategies found in the literature as either *proactive* (i.e., self-control strategies that can be used before a person encounters a spending temptation) or *reactive* (i.e., self-control strategies that can be used when a person already feels tempted to spend). Most of the studies tested reactive (vs. proactive) strategies. Contrary to the position of self-control models that proactive strategies should be more effective than reactive strategies, the meta-analysis found no such difference in effect sizes of studies examining financial self-control strategies for spending and saving outcomes. However, it should be noted that strategies coded as reactive in the experimental context might also be sometimes employed as proactive strategy

*outside* the lab. For example, if the study compared paying with cash or credit card for a purchase, “paying cash” was coded as reactive strategy because the strategy was used during the spending situation (Prelec & Simester, 2001). However, if someone were to use this strategy outside a lab setting, the strategy could require one to have foresight and plan for having cash on hand by visiting an ATM or bank before going shopping. Other strategies, such as budgeting or planning, could also be used either proactively or reactively depending on the situation. For example, in anticipation of temptations, a person could create a monthly budget (proactive strategy), and when shopping, the person could think about the monthly budget to resist a specific temptation (reactive strategy). In sum, the coding of strategies as reactive or proactive depends heavily on the experimental context of the studies and should be interpreted with caution. Coding of studies with regards to whether they assessed saving or spending was more straightforward. The effectiveness of the self-control strategies did not differ according to whether the strategy was used to increase saving or decrease spending, suggesting self-control strategies can be similarly helpful for not only reducing an unwanted behaviour (e.g., spending more than planned), but also encouraging a desired behaviour (e.g., putting money in a saving account).

In sum, the meta-analysis provided a collection of financial self-control strategies in the academic literature. How similar is this academic body of knowledge of effective self-control strategies to media communications or people’s own financial habits? In the next studies, I examined two perspectives on spending strategies that might differ from the academic discourse. I examined what self-control strategies are communicated to the public via online media (study 1) and what self-control strategies lay people report using (study 2).

### **Study 1: Media Financial Self-Control Strategies**

It is unlikely that a lay person would turn to academic journals to learn about self-control and goals. They would most likely just “Google it”. In the next study, I conducted an analysis of the financial self-control strategies communicated in a sample of online media. This media perspective examines how many of the empirically tested self-control strategies are covered in online media communications, addressing how well the academic knowledge is mobilized and reaches the public via media communications. I also compare these ‘media’ strategies in terms of strategy type (proactive vs. reactive) and outcome (saving vs. spending).

#### **Methods**

I collected a sample of unique online webpages about financial self-control from Google.com (the most popular search engine worldwide; Davies, 2018) in January 2020. The search terms were specific to financial strategies: “save money”, “spend less money”, “strategies to save more money”, “strategies to spend less money”, “save more money AND self-control OR willpower”, “spend less money AND self-control OR willpower”. I included ‘willpower’ as a search keyword because I anticipated lay people would use willpower and self-control interchangeably. The search was restricted to English language webpages and webpages created in the last 10 years. The first 30 results for each search term were included (this is equivalent to the first three pages of a default Google search; note that only 5% of internet users continue to page two; Kaye, 2013), resulting in 180 webpages. Duplicate webpages ( $n = 54$ ) and irrelevant webpages (e.g., e-books, forums;  $n = 22$ ) were excluded, resulting in a final sample of 104 webpages.

Next, three raters coded the webpages in two steps. First, raters coded each webpage for the number of self-control strategies listed on the webpage (e.g., 0 if no specific strategies are

recommended, 1 if only one strategy is recommended, 2 if two strategies are recommended, and so on), the type of webpage (*Magazine / Newspaper / Blog / Organization*), and the author credentials (*Finance expert / Economist / Journalist / Lay person / No author given or unclear*). Coding for webpage type differentiated between websites that specialize in financial topics (e.g., banks, money advice blogs, organizations selling financial services) or did not specialize in providing financial information (e.g., news outlets, self-help blogs, life coaches selling their services). Author information was missing or was unclear in almost a third of the webpages ( $n = 32, 30.8\%$ ) and I did not further analyze the author credential coding.

Second, raters coded each strategy for the strategy type (*Proactive strategy / Reactive strategy / Not a self-control strategy*), the strategy category (e.g., create or use budgets, avoid spending temptations, automatize saving, etc.), the strategy outcome (*Decrease spending / Increase saving / Both / Other financial outcome*), and whether a reference is cited for the strategy (*Yes / No*). Strategy categories were based on the strategies identified in the meta-analysis literature search and additional strategy categories were generated for strategies in the online media that were not found in the literature search.

I coded all 104 webpages and two research assistants coded 52 webpages each. Thus, each webpage was coded by two independent raters (i.e., myself and an additional rater). Overall, there was moderate to strong agreement ( $\kappa$  range = .65 to .87; McHugh, 2012) between the raters for webpage type,  $\kappa_{\text{first author/rater1}} = .651, SE = .075, \kappa_{\text{first author/rater2}} = .751, SE = .070$ ; webpage author credentials,  $\kappa_{\text{first author/rater1}} = .771, SE = .068, \kappa_{\text{first author/rater2}} = .760, SE = .071$ ; strategy type,  $\kappa_{\text{first author/rater1}} = .769, SE = .020, \kappa_{\text{first author/rater2}} = .755, SE = .019$ ; strategy category,  $\kappa_{\text{first author/rater1}} = .874, SE = .019, \kappa_{\text{first author/rater2}} = .805, SE = .022$ ; strategy outcome:  $\kappa_{\text{first author/rater1}} = .710, SE = .046, \kappa_{\text{first author/rater2}} = .799, SE = .044$ ; and strategy reference:  $\kappa_{\text{first}}$

author/rater1 = .832, SE = .052,  $\kappa$  first author/rater2 = .700, SE = .082. As the primary rater, I resolved inconsistencies in coding due to my experience with the self-control literature. Note that this study is exploratory and descriptive and there were no potentially biasing hypotheses. Therefore, it is unlikely that the coding was biased by me being the primary coder. See Appendix B for the coding guide and data.

## Results

### *Webpage Characteristics*

Across 104 webpages, the media sample included 1,950 suggestions for how to reduce spending or increase saving. On average, there were 17.91 suggestions per webpage, ranging from 1 to 206 per webpage. Of these suggestions, 56.3% ( $n = 1098$ ) were not self-control strategies (e.g., suggestions to downsize, to earn more money, to move to a cheaper city). In total, the media sample included 852 self-control strategies from 104 webpages.

Of the 104 webpages, about half (52.9%) were from websites that specialize in financial topics (financial organizations  $n = 29$ , financial blogs  $n = 19$ , financial newspapers/magazines  $n = 7$ ) and the other half did not (other organizations  $n = 26$ , other blogs  $n = 11$ , other newspapers/magazines  $n = 12$ ). I examined whether finance focused webpages and other webpages differed in the number of proactive vs. reactive strategies and the number of saving vs. spending strategies they recommended. There was no significant difference between finance focused vs. other webpages and the types (proactive, reactive) of recommended strategies,  $\chi^2(1, N = 851) = 0.36, p = .551$ , or the outcome of the recommended strategies (saving, spending),  $\chi^2(1, N = 832) = 0.77, p = .380$ .

### *Strategy Characteristics*

Strategy categories are listed by frequency in Table 3. The three most commonly promoted strategies were being a savvy shopper (e.g., using coupons, purchasing on sale items only, shopping around for the best price), avoiding tempting situations (e.g., not browsing online/in store, avoiding shopping when hungry or in a bad mood, going to the library to rent movies and books), and avoiding spending situation by “doing it yourself” (e.g., bringing lunch to work, making your own coffee, wash your own car). Most of the self-control strategies in the media sample were proactive strategies ( $n = 684$ , 80.2%) rather than reactive strategies ( $n = 168$ , 19.7%). More strategies were focused on decreasing spending ( $n = 737$ , 86.5%) than increasing saving ( $n = 95$ , 11.1%). A minority of strategies ( $n = 21$ , 2.5%) were described as appropriate for either saving or spending goals or were focused on other financial outcomes (e.g., reducing debt, improving credit score). Only 60 (7%) of the 852 strategies included a reference to another source of information for the strategy (e.g., a research article, financial expert, book, other webpage).

Of all strategy categories identified in the media sample, 13 (out of 22 strategy categories listed) overlapped with strategies identified in the meta-analysis literature search. Put differently, 55.4% ( $n = 472$ ) of the 852 self-control strategies listed in the media sample were strategies for which the strategy category overlapped with one of the 18 strategies collated in the meta-analysis, and 44.6% were strategies that did not come up in the meta-analysis literature search.

**Table 3***Media Financial Self-Control Strategies Frequency Table*

Strategy category	Count	%	Link to article identified in meta-analysis
Savvy shopping (e.g., use coupons, only buy on sale items shop for best price, avoid brand name items)	181	21.2	Milkman & Beshears, 2009
Avoid tempting places, people, activities	139	16.3	
Avoid spending temptations by doing it yourself (e.g., make your lunch/coffee, fix your own car)	108	12.7	
Make a plan	57	6.7	Davydenko & Peetz, 2020
Automatize	55	6.4	Bronchetti et al., 2011
Create or use budgets/mental accounting	55	6.4	Sheehan & Van Ittersum, 2018; Cheema & Soman, 2006
Track accounts/spending or saving behaviour	40	4.7	Akbas et al., 2016
Make money hard to access (e.g., leave wallet at home, cut up card to saving account)	36	4.2	Somville & Vandewalle, 2018
Set or think about your financial goals	35	4.1	
Think about if you need or want it	31	3.6	
Pay cash only	26	3.0	Helion & Gilovich, 2014; Prelec & Simester, 2001; Raghubir & Srivastava, 2008
Wait before making the purchase	25	2.9	
Rely on others for support (e.g., give partner credit card, consult financial advisor)	14	1.6	
Think about or imagine your future self	7	0.8	Hershfield et al., 2011
Translate money into time spent working	6	0.7	
Think about or imagine your future regret	4	0.5	Keinan & Kivetz, 2008
Choose to pay now rather than later	4	0.5	Wertenbroch et al., 2001
Use a retirement saving projection plan	3	0.4	Fajnzylber & Reyes, 2015
Apply for saving account with no early withdrawals	2	0.2	Beshears et al., 2011
Save before spending (e.g., save 50% of income, spend what is left after saving)	2	0.2	
Use rewards to motivate self	2	0.2	
Think about the reasons for your financial goal	2	0.2	Rudzinska-Wojciechowska, 2017
Other strategies	18	-	

*Note.* Strategies included in this table were mentioned at least twice, otherwise they were

included in the ‘Other strategies’ category. References in the meta-analysis column refer to academic papers on a similar strategy.

## Discussion

This study showed some overlap between the kind of strategies mentioned in an online media sample and the kind of strategies studied in the academic literature: about half the strategies recommended in a sample of webpages were also identified in the meta-analysis literature search. Thus, there is still a large gap between what is studied by researchers and what is recommended online. Furthermore, media recommendations were in one case directly opposed to academic findings: The most common strategy in the online media was being a savvy shopper, which includes using coupons. However, empirical evidence (Milkman & Beshears, 2009) suggests that using coupons actually *increased* spending. To further illustrate the gap between academic and media views on financial self-control strategies, only 7% of the strategies had a reference to another source, suggesting many of the media recommendations are made without expert input.

Communications in the media sample focused heavily on proactive (vs. reactive) strategies. Proactive strategies may be perceived as more effective, in line with self-control theories posited by researchers (Duckworth et al., 2014; Hofmann & Kotabe, 2012). Alternatively, it might be that reactive strategies, such as imagining your future self (Ersner-Hershfield et al., 2011) or thinking about the reasons for your goal (Rudzinska-Wojciechowska, 2017), are seen as less relevant because they are more psychological in nature (i.e., more about how people think about a situation rather than about controlling the situation). This may be because people think that psychology is not as relevant to their financial goals as it is to other goals (e.g., health, work, school). Achieving a financial goal is influenced by external factors outside a person's motivation and self-control (e.g., employment, banking institutions, or the stock market). For example, someone could successfully resist temptations and regularly

contribute to a retirement fund, but an economic recession could result in them not meeting their retirement saving goal. As a result, people may think reactive, psychological strategies are not as effective for their financial goals as proactive strategies, which are better suited for controlling financial situations.

Note that this sample of online media was a convenience sample. Search results would change with time, keywords, and the country code of the Google site. The aim was not to find an exhaustive list of strategies communicated in the media, rather to collect a sample of the online discourse on financial self-control strategies.

### **Study 2: Lay Financial Self-Control Strategies**

In the next study I examined a third perspective on financial self-control strategies: participants' own self-report. I asked individuals to describe the strategies they use in their daily life and then coded these self-reported strategies based on strategy type and outcome.

#### **Methods**

##### ***Participants***

I recruited 1000 participants from Amazon's Mechanical Turk (MTurk) to complete an online study on Qualtrics about income variability. Participants were compensated with \$1.00. There were no exclusion criteria to participate in this study, but recruitment was limited to only Canadian and American MTurk workers. Sixty-one participants were excluded because they wrote a nonsensical response about their strategy use (e.g., copied instructions, random words) resulting in a final sample of 939 participants. Participants were on average 37.22 years old ( $SD = 11.57$ ;  $range_{age} = 18$  to 76 years old; 46.8% female). Almost half (44.4%) had an undergraduate degree or higher, the median gross personal income was \$30,000 - \$39,999, 48.5% were homeowners, 25.6% lived in single households by themselves, 44.3% were married

or living with a common-law partner, and 43.0% had children living with them. This study was approved by the Carleton University Research Ethics Board – B.

### ***Procedure***

The question on financial self-control strategy use was asked in the larger context of a study on financial beliefs and decisions. After agreeing to participate in the study in the informed consent form, participants reported their demographics, income sources, income variability, a variety of measures of financial behaviours, and responded to one item on what strategy they use. See Appendix C for the complete materials. For the present study, only responses to the open-ended question “What kinds of strategies do you use in your own life to limit spending and increase saving?” were analyzed.

Two raters and I coded the described strategies into strategy type (proactive, reactive), strategy outcome (saving, spending), and strategy categories (e.g., avoid tempting situations, wait before making purchases, track account balances). Strategy categories were based on the strategies identified in the meta-analysis literature search and the online media coding; one additional strategy category (i.e., think about past financial problems) was generated because this strategy was not found in the literature search or the online media. The vast majority of participants described only one strategy ( $n = 702$ , 84.6%), but some participants did spontaneously describe more than one strategy (two strategies:  $n = 96$ , 11.6%; three strategies:  $n = 24$ , 2.9%; four strategies:  $n = 7$ , 0.8%; five strategies:  $n = 1$ , 0.1%). When multiple strategies were listed, only the first strategy was coded. Any self-control strategies that were mentioned fewer than two times were placed into an ‘other’ category. There was small to moderate agreement between coders ( $\kappa$  range = .35 to .62; agreement for strategy type:  $\kappa_{\text{rater1/rater2}} = .35$ ,  $SE = .02$ ; agreement for strategy outcome:  $\kappa_{\text{rater1/rater3}} = .62$ ,  $SE = .03$ ; agreement for strategy

category:  $\kappa_{\text{rater1/rater2}} = .59$ ,  $SE = .02$ . McHugh, 2012). Raters resolved inconsistencies through discussion, resulting in 100% agreement. See Appendix C for the coding guide and data.

## Results

Of the entire sample, 41 participants said they did not use any strategies and 68 participants did not describe a *self-control* strategy (e.g., instead they reported working more, investing money). The remaining 830 participants described a financial self-control strategy that was coded. The majority of participants' self-reported strategies were proactive ( $n = 556$ , 67.0%) rather than reactive ( $n = 274$ , 33.0%). Most strategies were aimed at reducing spending ( $n = 642$ ; 77.3%) rather than increasing saving ( $n = 133$ ; 16.0%). Some strategy descriptions were not detailed enough to determine the category or the strategy could be used for either saving or spending goals ( $n = 55$ ; 6.6%).

Table 4 lists the strategy categories that emerged from the coding by frequency. The most popular self-control strategies were creating/using a budget, thinking about if you need or want the item, and making money hard to access. Of the 20 strategy categories identified in this sample, 10 (50.0%) of the self-reported strategies mapped on to the strategies identified in the meta-analysis literature search (e.g., making money harder to access, Somville & Vandewalle, 2018; setting specific goals, Tam & Dholakia, 2008). Put differently, 443 (53.4%) of the 830 participants listed strategies that were similar to one of the 18 strategies collated in the literature review. Nineteen (95.0%) of the self-reported strategies mapped onto the strategies identified in the media sample. Put differently, 783 (94.3%) of the 830 participants listed strategies that were similar to one of the 22 strategies collated in the media sample.

**Table 4***Financial Self-Control Strategies, Examples, and Frequency in a Lay Person Sample*

Strategy category	Example (direct quotes from participants)	Count	%	Link to article identified in meta-analysis	Media sample
Create or use budgets/mental accounting	<i>Keep a strict by the penny budget. Make sure to include free and inexpensive small pleasures. Wish list for food and other items I cannot afford now.</i>	138	17.3	Sheehan & Van Ittersum, 2018; Cheema & Soman, 2006	✓
Think about if you need or want it	<i>When I want something, I ask myself how much I really need it or if I'll actually use it before I decide if I'll buy it or not.</i>	109	13.7		✓
Make money hard to access (e.g., leave wallet at home, cut up access card to saving account)	<i>I have put my credit cards in a jar of water and put this in the freezer. It's prevented me from impulse spending.</i>	95	11.9	Somville & Vandewalle, 2018	✓
Avoid tempting places, people, activities	<i>If shopping, I go only to the aisles where the items I need are located. I don't allow myself to window shop unnecessary things or I will buy them.</i>	70	8.8		✓
Savvy shopping (e.g., use coupons, only buy on sale items, avoid brand name items)	<i>I use coupons and research sell prices to maximize savings.</i>	49	6.2	Milkman & Beshears, 2009	✓
Save before spending (e.g., save 50% of paycheque, limit spending by saving first)	<i>I save at least 40% of what I earn each month, after I pay all the necessary bills in that month.</i>	47	5.9		✓
Set or think about your financial goals	<i>My husband and I just keep talking about our goal of building a house, so it's top of mind all the time to keep me from spending when I shouldn't.</i>	41	5.2		✓
Track accounts/spending or saving behaviour	<i>I keep a chart of all of my expenses for the month and track my spending and savings over time.</i>	40	5.0	Akbas et al., 2016	✓
Think about or imagine your future self	<i>Think of my kids future, think of myself where I want to be like retired and how it would feel to be still working into retirement.</i>	39	4.9	Hershfield et al., 2011	✓

Wait before making the purchase	<i>Whenever I have the desire to buy something, I wait a week, and if I still want to buy it, then I buy it after checking for the best deal.</i>	28	3.5		✓
Automatize (e.g., automatic deductions from paycheck)	<i>I have made a 'bill' that automatically comes out of each paycheck that is deposited into savings. This way it is gone before I can spend it.</i>	27	3.4	Bronchetti et al., 2011	✓
Rely on others for support (e.g., give partner credit card, consult financial advisor)	<i>I gave my husband the password to my credit card account to keep me honest and help me stay on track with my spending!</i>	22	2.8		✓
Pay cash only	<i>I have recently started a new method of taking out \$200 in cash on Sunday's. It helps me to see exactly what I have spent and what I have left.</i>	18	2.3	Helion & Gilovich, 2014; Prelec & Simester, 2001; Raghurir & Srivastava, 2008	✓
Use rewards to motivate self	<i>For every \$1000 I save I buy a new purse for myself.</i>	17	2.1		✓
Think about or imagine your future regret	<i>I tell myself that I will regret wasting money when I desperately need it.</i>	16	2.0	Keinan & Kivetz, 2008	✓
Think about your past or current debt or financial problems	<i>I just think about how horrible it was for me when I was completely broke – I literally had nothing, was sleeping in an airport. Thinking of that puts things into perspective.</i>	13	1.6		
Translate money into time spent working	<i>I try to think of the amount of time I spent making the money I am spending.</i>	12	1.5		✓
Make a plan	<i>I create a shopping list for myself. If it's not on the list, then I don't buy it.</i>	9	1.1	Davydenko & Peetz, 2020	✓
Avoid spending temptations by doing it yourself (e.g., make your lunch/coffee, fix your car)	<i>Do my own nails and color my own hair. Eat at home often.</i>	4	0.5		✓
Apply for a saving account with no early withdrawals	<i>Put money into funds that penalize me for early withdrawal.</i>	2	0.3	Beshears et al., 2011	✓
Other strategies		34	-		

*Note.* Strategies included in the table were mentioned at least twice, otherwise they were included in the ‘Other Strategies’ category.

References in the meta-analysis column refer to academic papers on a similar strategy. Checkmarks in the media sample column refer to a similar strategy mentioned on a website.

## Discussion

This study suggests that the vast majority of people use self-control strategies in their daily life, as only 4.4% of people reported that they do not use any strategies when pursuing financial goals. Furthermore, this study again suggested a gap between the literature (as summarized in the meta-analysis) and people's day-to-day use of self-control strategies, as only about half the self-reported strategies overlapped with strategies identified in the meta-analysis literature search. As there was a considerably larger overlap between self-reported strategies and strategies identified in the media sample it suggests that either lay people learn about financial self-control strategies from the media or lay people are writing the media webpages.

Note that this sample of lay person reports was an American convenience sample recruited through MTurk. Thus our findings are based on a specific subset of the population (younger, more educated, and more white; Stone et al., 2019) and may not generalize to other populations. The media sample (Study 1) and the lay sample (Study 2) collected strategies from the American media and the American lay people. Cultural or country differences may also impact the generalization of these strategies depending on people's approaches to money (e.g., differences in risk perception, Weber & Hsee, 1998) and on the financial institutions in their country (e.g., differences in online banking, Yuen et al., 2010). Also, individual differences, such as age, might play a role in strategy use (e.g., older people might prefer paying by cash more than younger people). For example, people high (vs. low) in trait self-control use more proactive, situational strategies to avoid temptation (Ent et al., 2015; Hofmann et al., 2012; Nielsen et al., 2019), and if tempted, they focus on the positive outcomes of self-control, create sub-goals, and regulate their emotions (Hennecke et al., 2019). Also, people in better financial situations tend to use more strategies that boost willpower (e.g., precommitment, anticipate guilt or regret) and

fewer strategies that reduce temptations (e.g., avoidance, distraction; Karlsson, 2003). It is likely that the types of strategies used differs by person, situation, group, and this research only presents a snapshot of the strategies people use in their daily life.<sup>2</sup>

### **Summary of Strategies Identified Across Studies**

So far, I have examined the financial self-control strategies studied in the academic literature (meta-analysis), strategies recommended in a sample of media articles on finances (Study 1), and strategies reported by a sample of North American adults (Study 2). Across these different perspectives, 28 unique financial self-control strategies were identified. See Figure 5 for the relative frequency of the strategies across all three perspectives.

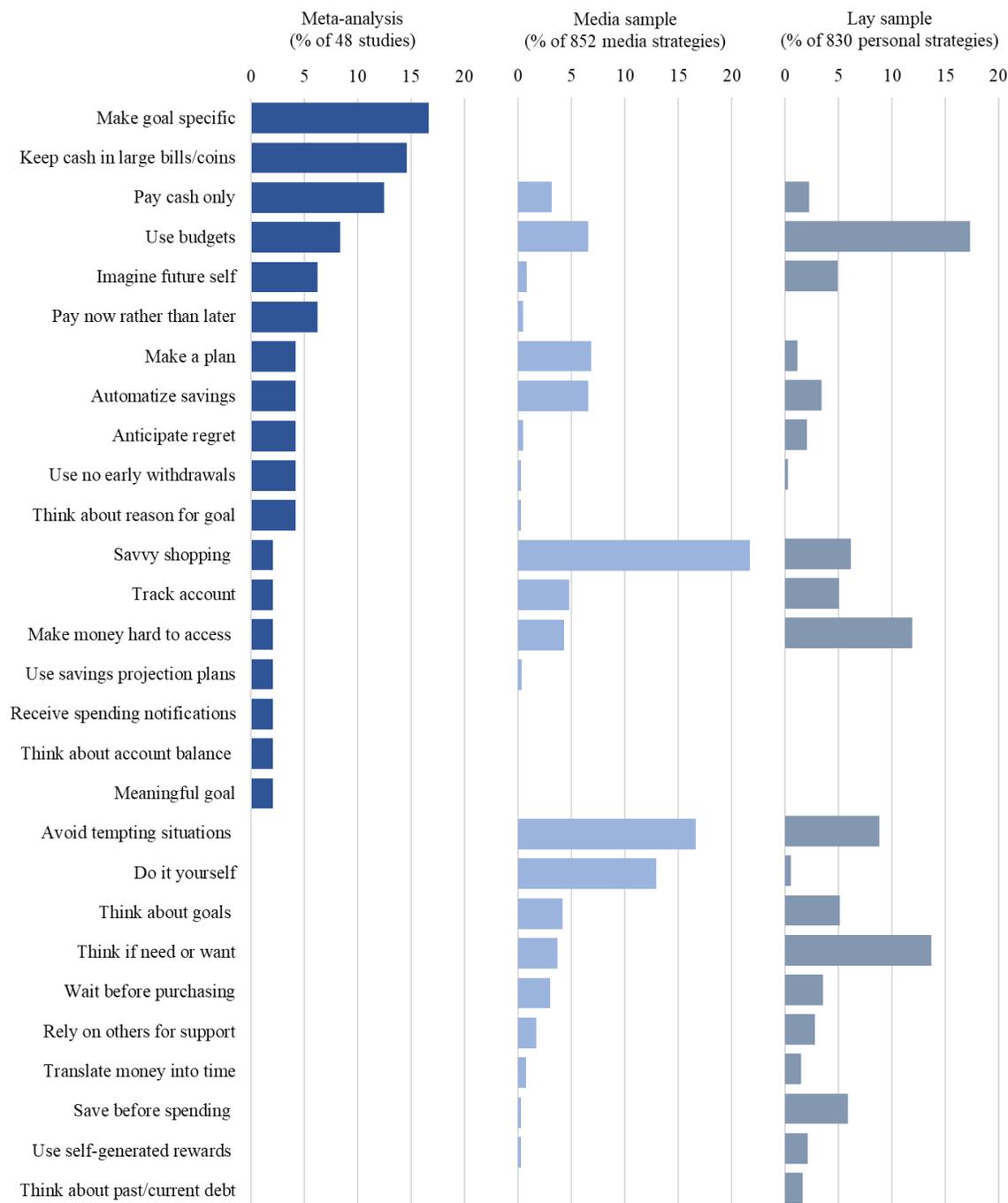
Decreasing spending (rather than increasing saving) was the primary purpose for financial self-control strategies across all three perspectives (academic literature search: 50%, media sample: 87%, lay sample: 77%). The proportion of proactive to reactive strategies was different across the academic, media, and lay person perspectives, but overall, proactive strategies were equally, if not more, common than reactive strategies across the three perspectives (50%, 80%, and 67%, respectively). According to the PI and Process models, proactive strategies should be more effective than reactive strategies because proactive strategies remove or restrict temptations from situations likely to be tempting, thereby reducing the need to engage in self-control (Duckworth et al., 2014; Hofmann et al., 2012). Similarly, lay people may believe that proactive strategies are more effective, and they may write about them more in the online media and report using them more than reactive strategies.

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<sup>2</sup> I conducted two additional studies examining participants' use and perceptions of strategies identified through the meta-analysis. These studies were completed after the first round of the literature search and before I updated the search with additional articles, and thus participants reported about only 13 of the now 18 strategies in the meta-analysis. For the sake of brevity I do not report these initial studies in the main text but rather report them in Appendix F.

**Figure 5**

*Panel Graph Showing Prevalence of Self-Control Strategies Across Perspectives*



*Note.* Each panel shows the percentage of how often each strategy was mentioned in each study.

Refer to Tables 1, 3, and 4 for strategy details. The Meta-analysis panel includes all strategies found in the literature search, not only the strategies included in the effect size calculations.

Approximately half of the specific strategies mentioned in a media sample and by lay persons matched with the specific strategies identified in the meta-analysis literature search. However, at least as many financial self-control strategies promoted in the media and reported by lay persons have not yet been studied in the academic literature. Notably, there were ten strategies that appeared in all three perspectives: anticipating future regret (Keinan & Kivetz, 2008), automatizing saving (Bronchetti et al., 2011), making a plan (Davydenko & Peetz, 2020), imagining your future self (Hershfield et al., 2011), making money hard to access (Somville & Vandewalle, 2018), using accounts with no early withdrawals (Beshears et al., 2011), paying only with cash (Helion & Gilovich, 2014; Prelec & Simester, 2001; Raghurir & Srivastava, 2008), savvy shopping such as using coupons (Milkman & Beshears, 2009), tracking accounts (Akbas et al., 2016; Hernández Escuer et al., 2014), and – the most frequent across all samples – using budgets (Sheehan & Van Ittersum, 2018; Cheema & Soman, 2006). These most relevant strategies had more proactive strategies (seven out of ten) than reactive strategies (three out of ten). The gap between the academic literature and the media and lay samples, suggests greater knowledge translation is needed to share research findings on self-control strategies with the public. Using the financial self-control strategies identified based on these three perspectives, I next examined strategy effectiveness for reducing monthly spending in two longitudinal studies.

### **Study 3: Self-Control Strategy Effectiveness Over Time**

In this and the next study, I examined the effectiveness of proactive and reactive financial self-control strategies on reducing spending over the course of a month. This study focused on reducing spending rather as critical outcome variable.<sup>3</sup> Strategy effectiveness is defined in this

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<sup>3</sup> An alternative outcome variable might be increasing saving. However, saving goals and actual saving is difficult to define because saving could mean different things to different participants. For example, saving behaviour could be putting money into a savings account or ‘saving’ money

study as bringing spending behaviour more in line with a goal. This longitudinal, experimental study assessed the effectiveness of sets of proactive and reactive self-control strategies, as well as willpower, to bring a person's monthly spending closer to their spending goals. The appropriate strategy for a spending temptation depends on a variety of situational factors (e.g., time, money, physical barriers, or social barriers). Therefore, I provided participants with sets of strategies, as opposed to a single strategy, to use throughout the month to allow for flexible strategy use among a multitude of spending situations and to add to participants' strategy repertoire (e.g., Ford et al., 2019). I expected participants who read about and were encouraged to use strategies (both proactive and reactive strategies) to spend less over the course of the month (relative to their spending goals) than those who were encouraged to use willpower or those who received no instructions. In exploratory analyses, I also examine the consequences of using strategies on the types of purchases people made throughout the month and their emotional state.

## **Method**

### ***Participants***

A sample of 277 participants would detect a small to medium effect ( $f \geq 0.20$ ) between four groups with 80% power. I overrecruited to account for attrition (expecting about 40% attrition) and exclusions, and I posted 500 slots on MTurk. To participate in this study, the minimum MTurk approval rate (i.e., the proportion of previously completed tasks that are approved) was set to at least 95% (as recommend by Peer et al., 2014; Robinson et al., 2019).

This study was approved by the Carleton University Research Ethics Board – B. By participating

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could be buying an item with a discount (i.e., I saved \$5 with this coupon). Spending, however, is characterized by the actual dollar amount spent on something, so more easily tracked.

in this study participants could earn up to \$7.50 USD in compensation (\$0.50 for the intake survey, \$0.50 for each of the 10 diary reports, \$1.00 for the exit survey, and \$1.00 for the follow-up survey). All surveys were completed through Qualtrics.

Five hundred and twenty-five Canadian and American MTurk workers completed the intake survey on the first day of the month (August 1, 2020). As preregistered, 51 participants (9.7%) were excluded for writing nonsense (e.g., they wrote non-answers such as “good”, copied the instructions instead of replying to the question, or entered meaningless strings of letters) in the open-ended attention check item in the intake survey. I also excluded 36 participants who reported a monthly spending goal that was double their monthly income; this was not a preregistered exclusion criterion but was deemed necessary in light of unexpectedly improbable spending goal values (e.g., a participant reported a monthly spending goal of \$60,000 but only a monthly income of \$6,000; the average spending goal was \$2,293.10, as comparison). Before excluding these participants, the spending goal distribution had a large positive skew ( $skew = 5.69$ ,  $SE = 0.11$ ), and excluding the participants who reported a spending goal that was more than double their monthly income reduced the skew of the distribution ( $skew = 1.86$ ,  $SE = 0.12$ ).

Of the remaining 438 participants, 315 (71.9%) completed the exit survey on or after August 31<sup>st</sup>. Exit survey completion did not differ by condition,  $\chi^2 (N = 438, df = 3) = 6.31, p = .098$ . In line with preregistered criteria, I excluded four monthly spending values as outliers ( $+3 SD$ ) and eight monthly spending values were missing in the exit survey. Thus, the total number of valid exit spending reports was 303 (control condition:  $n = 73$ ; willpower condition:  $n = 79$ ; proactive condition:  $n = 81$ ; reactive condition:  $n = 70$ ).

Participants were on average 41.70 years old ( $SD = 12.79$ ; 56.6% male, 43.4% female; 81.5% white). Over half (61.3%) had an undergraduate degree or higher, the average annual

personal income was \$40,000-49,999, 75.2% worked full time, 24.0% lived in single households by themselves, 58.7% were married or living with a common-law partner, and 49.5% had children living with them.

In addition to the intake and exit surveys, I also sampled strategy use and spending on several days throughout the month. Participants were contacted 10 times during the month and were prompted to complete a daily report. Of the total 3,105 daily reports submitted, I excluded 95 reports (3.1%) from analysis because the spending situation description was nonsense (e.g., copied instructions, random words). I did not exclude reports that left the spending situation description blank. Finally, I excluded 11 daily spending values as outliers ( $+3 SD$ ) and 24 daily spending values were missing; thus, the total number of reports containing valid daily spending values is 2,975 from 384 participants. The average number of daily reports completed by participants was 7.74 ( $SE = 0.15$ ), and 70.3% ( $n = 270$ ) completed eight or more diary reports (15.9%,  $n = 61$ , completed three or fewer diary reports). The number of reports participants completed did not differ by condition,  $F(3, 381) = 0.34, p = .796$ .

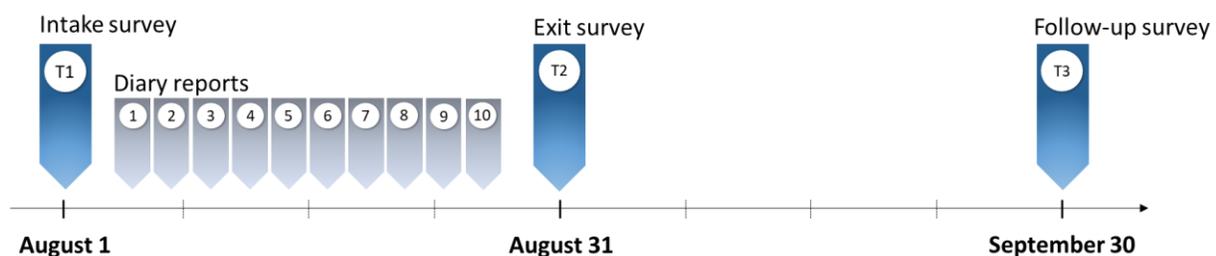
Finally, I also contacted participants for a one-month follow-up. For this additional follow-up, 221 participants completed the survey on or after September 30<sup>th</sup> and survey completion did not differ by condition,  $\chi^2(N = 303, df = 3) = 3.95, p = .267$ . In line with preregistered criteria, I excluded five monthly spending values as outliers ( $+3 SD$ ) in the follow-up survey. Thus, the total number of valid follow-up spending reports was 216 (control condition:  $n = 58$ ; willpower condition:  $n = 56$ ; proactive condition:  $n = 54$ ; reactive condition:  $n = 48$ ).

## Procedure

This study assessed participants at several points in time. See Figure 6 for an overview of the data collection procedure. See Appendix D for the preregistration (<https://aspredicted.org/blind.php?x=ue9nq2>), the full study materials, and a link to the data.

## Figure 6

*Study 3 Data Collection Timeline*



### *Intake Survey (T1)*

On the first day of the month (August 1, 2020), participants completed the intake survey (T1). After agreeing to participate in the study in the informed consent form, participants completed a demographic survey with gender, age, highest level of education, household size (number adults, number of children), marital status, ethnicity, work schedule (“On average, how many hours do you work a week, including time at an office, in the field, or working at home?”, *35 or more hours / less than 35 hours / not employed*), and employment status (“Has your employment status changed due to the COVID-19 pandemic?”, *Yes / No*). Next, I asked about their total annual personal income before taxes, how much their income changes (1 = *Amount of income is the same every month* to 7 = *Amount of income changes a lot from month to month*) and how stressed they feel about their financial situation (1 = *Not at all stressed* to 10 =

*Extremely stressed*). Participants also filled out a revised version of the Financial Capability Scale (Robson & Splinter, 2015), reporting whether they contributed to their saving account in the last year (*Yes regularly / Yes at least once / No / I don't know*), whether they were behind on a bill, rent, or loan payment in the last year (*Yes / No*), whether they have a budget (*Yes / No*), how often they budget (select all that apply: 1 = *Daily*, 2 = *Weekly*, 3 = *Monthly*, 4 = *Yearly*, 5 = *Other* [text box], 6 = *I do not budget*), and whether they are planning financially for retirement (*Yes / No / I don't know / I'm already retired*). See Table D1 in Appendix D for descriptive information about the sample's demographics and financial capabilities.

**Strategy Conditions.** Participants were then randomly assigned to one of four conditions. Participants in the *proactive strategies condition* were told to use three self-control strategies that can be used before encountering a spending temptation in their daily life: *avoid tempting situations* (e.g., Duckworth et al., 2016; Hofmann et al., 2012; Milyavskaya et al., 2015), *limit access* (e.g., Somville & Vandewalle, 2018), and *plan purchases* (e.g., Davydenko & Peetz, 2020). After reading about each of the three strategies, participants rated their current use of each strategy (1 = *Never*, 2 = *Rarely*, 3 = *Occasionally*, 4 = *Most of the time*, 5 = *All the time*). Participants in the *reactive strategies condition* were told to use three self-control strategies that can be used during a spending temptation in their daily life: *think if you need or want the item* (e.g., Bayley & Nancarrow, 1998), *wait before deciding* (e.g., Loewenstein, 2005), and *anticipate regret* (e.g., Keinan & Kivetz, 2008). After reading about each of the three strategies, participants rated their current use of each strategy (1 = *Never*, 2 = *Rarely*, 3 = *Occasionally*, 4 = *Most of the time*, 5 = *All the time*). These specific six strategies were selected because they were most clearly proactive and reactive. Strategies that can be used both proactively (e.g., creating a monthly budget) and reactively (e.g., remembering your budget when shopping) were not

selected to make the conditions as different as possible. Participants in the *willpower condition* were told to use self-control to resist temptations and to train their self-control muscle (see study materials in Appendix D for willpower instructions). In the *control condition*, participants were given no instructions about using self-control strategies or willpower. I consider randomization to be successful because there were no significant differences by condition for any of the demographic, financial capability, or exploratory scale measures.

**Spending Variables.** Next, all participants reported their spending goal for the month (August), as a dollar value in an open-ended text box.<sup>4</sup> They were instructed to include both basic living expenses (e.g., mortgage) and discretionary spending (e.g., entertainment) in their goal. As an attention check, I asked participants to describe why this is their spending goal.

Participants also completed exploratory scales on their trait self-control (Tangney et al., 2004), personality traits (extraversion, agreeableness, openness, conscientiousness, and neuroticism; Gosling et al., 2003), and emotions (positive affect and negative affect; Diener et al., 2009), but these questionnaires were not used in the main analyses. See Table D1 in Appendix D for mean values on these exploratory scales. Finally, participants selected whether they wanted to receive email reminders about the spending reports. All participants who completed the intake survey (T1) were eligible to participate in all following surveys through MTurk.

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<sup>4</sup> Participants reported spending in dollars without specifying if their goal or actual spending was in Canadian (CAD) or American (USD) currency. I also did not record participants' current country of residence. The difference in value between CAD and USD may have introduced additional variance in the spending goal and monthly spending variables. On August 31, 2020, \$1 CAD = \$0.77 USD.

### ***Sampled Daily Reports***

Participants were emailed in the evening 10 times throughout the month to report on their spending experiences that day. For each of these reports, participants first reported how many spending situations they had encountered that day where they made a purchase (up to five situations) and then described each of the spending situations in an open-ended text box. On average, participants encountered 1.42 spending situations ( $SE = 0.05$ ) a day. There was no significant difference by condition for the number of spending situations encountered,  $F(3, 305.35) = 0.87, p = .455$ . Participants also reported up to five spending situations where they were tempted to spend, but ultimately did not spend ( $M = 0.79, SE = 0.05$ ); there was no significant difference by condition,  $F(3, 325.89) = 0.51, p = .677$ . Next, participants in the proactive and reactive strategy conditions reported on self-control strategy use. For each spending situation they described where they made a purchase (up to five situations), participants in the proactive and reactive strategy conditions selected all the strategies they had used (*avoid places, limit access, or plan purchases* in the proactive condition; *need vs. want, wait, or anticipate regret* in the reactive condition), and/or described a different strategy that they used, or selected that they did not use any strategies for that spending situation. Participants in the willpower condition reported whether they used willpower in each spending situation they described (*Yes / No*). Participants in the control condition did not report on strategy or willpower use, they only listed spending situations.

Next, all participants reported how much they spent in dollars and how many purchases they made that day. Finally, in exploratory variables, participants reported how many of those purchases were objects, experiences, intended for others, intended for themselves, made online,

and made in person. Finally, participants reported how tired and how happy they felt in the moment, on single items, respectively (1 = *Not at all* to 7 = *Extremely*).

### ***Exit Survey (T2)***

On the last day of the month (August 31, 2020), participants were contacted in the evening for the exit survey (T2). In this survey, they reported how much they spent in total during last month (August), including basic expenses and discretionary spending. They reported this in an open-ended text box, in dollars. Next, all participants reported on their willpower use (“How often did you use willpower to resist a temptation to spend money during the month of August?”, 1 = *Never*, 2 = *Rarely*, 3 = *Occasionally*, 4 = *Most of the time*, 5 = *All the time*). All participants reported on how often they used each of the six strategies described in the proactive and reactive conditions in the past month (i.e., August) and how willing they are to use this strategy in the future (1 = *Never*, 2 = *Rarely*, 3 = *Occasionally*, 4 = *Most of the time*, 5 = *All the time*). Participants could also describe additional strategies in an open-ended text box; 25.7% of participants ( $n = 78$ ) described additional strategies. Aggregating how often participants used the individual strategies into a mean proactive strategy use index ( $\alpha = .51$ ) or a mean reactive strategy use index ( $\alpha = .63$ ) yielded low reliability, and therefore the strategies were examined individually.<sup>5</sup>

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<sup>5</sup>Reliability alpha was also likely influenced by the low number of items (three strategy use items) used to calculate the mean (Komorita & Graham, 1965). An exploratory principal component analysis with oblimin rotation of the exit survey (T2) strategy use loaded onto two factors: planning purchases and thinking about needs vs. wants (eigenvalue = 19.0% of variance); and limiting access, avoiding places, waiting, and anticipating regret (eigenvalue = 39.3% of variance). In the follow-up survey (T3), strategy use loaded onto two factors: planning purchases, thinking about needs vs. wants, waiting, and anticipating regret (eigenvalue = 36.2% of variance); and limiting access and avoiding places (eigenvalue = 19.6% of variance). In both the exit and follow-up survey, planning purchases loaded more with reactive strategies than proactive strategies.

Next, participants rated how typical this month was in terms of their experiences and actions in general/since the COVID-19 pandemic began and how typical it was in terms of their spending patterns in general/since the COVID-19 pandemic began (1 = *Not at all typical* to 7 = *Extremely typical*). Finally, participants reported on their spending goal in dollars for the next month (September), in the same way as they had reported their spending goal for August in the intake survey (T1).

### ***Follow-Up Survey (T3)***

On the last day of the following month (September 30, 2020), participants were contacted in the evening for the follow-up (T3) survey. In this survey they again reported on their monthly spending and strategy use in the previous month (i.e., September). This survey was identical to the exit survey (T2). In the debriefing form, all participants were informed of the purpose of the study and were given the six strategies used in this study.

## **Results**

### ***Initial Analyses: Strategy Use by Condition***

First, I examined whether the conditions affected participants' reported strategy use (not preregistered). Participants reported on strategy use in the T2 survey and the T3 survey (in the T1 survey, only those participants assigned to the reactive or proactive condition rated strategy use). Means by condition are presented in Table 5.

**Table 5**

*Mean Ratings for Frequency of Willpower Use and Strategy Use by Condition and Survey*

	T1 survey		T2 survey				T3 Survey			
	<i>M (SE)</i>		<i>M (SE)</i>				<i>M (SE)</i>			
	Proactive condition	Reactive condition	Control condition	Willpower condition	Proactive condition	Reactive condition	Control condition	Willpower condition	Proactive condition	Reactive condition
Willpower	-	-	3.26 (0.10)	3.39 (0.10)	3.27 (0.10)	3.29 (0.10)	3.37 (0.10)	3.33 (0.12)	3.42 (0.12)	3.20 (0.11)
<i>Proactive strategies</i>										
Avoid places	3.25 (0.10)	-	2.88 (0.14)	3.24 (0.13)	3.09 (0.14)	2.96 (0.14)	3.12 (0.14)	3.28 (0.15)	3.05 (0.15)	3.08 (0.16)
Limit access	2.08 (0.11)	-	1.97 (0.13)	2.20 (0.15)	1.84 (0.14)	2.03 (0.16)	1.83 (0.14)	1.95 (0.18)	1.62 (0.13)	1.73 (0.17)
Plan purchases	3.53 (0.09)	-	3.71 (0.11)	3.81 (0.09)	3.72 (0.12)	3.83 (0.12)	3.78 (0.12)	3.88 (0.12)	3.80 (0.15)	3.88 (0.11)
<i>Reactive strategies</i>										
Need vs. want	-	3.61 (0.07)	4.01 (0.11)	3.84 (0.10)	3.69 (0.13)	3.77 (0.12)	4.05 (0.12)	3.88 (0.14)	3.89 (0.15)	3.88 (0.13)
Wait	-	3.20 (0.10)	2.77 (0.16)	2.87 (0.14)	2.79 (0.15)	2.97 (0.14)	2.80 (0.16)	2.65 (0.17)	2.80 (0.17)	2.78 (0.16)
Anticipate regret	-	2.95 (0.10)	3.16 (0.14)	3.27 (0.13)	3.14 (0.15)	3.12 (0.15)	3.35 (0.14)	2.81 (0.16)	3.20 (0.17)	3.20 (0.18)

*Note.* All ratings were on 5-point scales (0 = *Never* to 5 = *All the time*).

In a one-way ANOVA, I entered condition as the predictor variable and willpower use, the use of the three proactive strategies, and the use of the three reactive strategies as the outcome variables. I found there were no significant differences between the conditions for use of willpower:  $F(3, 298) = 0.38, p = .764, \text{partial } \eta^2 = .001$ ; use of the three proactive strategies: *avoid places*,  $F(3, 298) = 1.30, p = .274, \text{partial } \eta^2 = .004$ , *limit access*,  $F(3, 298) = 1.13, p = .337, \text{partial } \eta^2 = .004$ , *plan purchases*,  $F(3, 298) = 0.29, p = .831, \text{partial } \eta^2 = .001$ ; or use of the three reactive strategies: *need vs. want*,  $F(3, 298) = 1.44, p = .232, \text{partial } \eta^2 = .005$ , *wait before deciding*,  $F(3, 298) = 0.38, p = .767, \text{partial } \eta^2 = .001$ , *anticipate regret*,  $F(3, 298) = 0.20, p = .898, \text{partial } \eta^2 < .001$ . A parallel ANOVA of the T3 survey responses also showed no significant differences between the conditions for use of willpower,  $F(3, 217) = 0.60, p = .614, \text{partial } \eta^2 = .009$ ; use of the three proactive strategies ( $F_s \leq 0.82, p_s \geq .486, \text{partial } \eta^2 \leq .011$ ), and use of the three reactive strategies ( $F_s \leq 2.16, p_s \geq .093, \text{partial } \eta^2 \leq .029$ ).

Therefore, participants in all conditions used strategies with a similar frequency. Participants in the control condition received no instructions to use willpower or strategies, but their reported willpower and strategy use was similar to the other conditions. This finding suggests that people use strategies spontaneously as often as when they are instructed to use specific strategies explicitly. In other words, this analysis showed no evidence that the condition manipulation shifted strategy use as intended.

In another attempt to find evidence that the condition affected strategy use, I examined the extent to which people changed in their reported use of strategies from T1 to T2 (not preregistered). A paired samples t-test of strategy use at T1 versus T2 showed no significant differences between how frequently people reported using the proactive and reactive (respectively, in these two conditions) strategies in general at T1 and the frequency with which

they reported having used them during the month at T2: *avoid places*,  $t(80) = 1.57$ ,  $p = .121$ ,  $d = 0.17$ ; *limit access*,  $t(80) = 1.62$ ,  $p = .110$ ,  $d = 0.18$ ; *plan purchases*,  $t(80) = -1.71$ ,  $p = .092$ ,  $d = -0.19$ ; *think if need or want*,  $t(68) = -0.89$ ,  $p = .375$ ,  $d = -0.11$ ; *wait before deciding*,  $t(68) = 1.30$ ,  $p = .197$ ,  $d = 0.16$ ; and *anticipate regret*,  $t(68) = -1.84$ ,  $p = .071$ ,  $d = -0.22$ . Similarly, participants also did not change their use of these strategies in September: A paired samples t-test of strategy use at T1 and strategy use reported at T3 showed no significant differences for four of the strategies (*avoid places*,  $t(53) = 1.22$ ,  $p = .229$ ,  $d = 0.17$ ; *limit access*,  $t(53) = 1.24$ ,  $p = .222$ ,  $d = 0.17$ ; *plan purchases*,  $t(53) = -1.74$ ,  $p = .087$ ,  $d = -0.24$ ; and *think if need or want*,  $t(47) = -1.35$ ,  $p = .182$ ,  $d = -0.20$ ). Participants reported one strategy (*wait before deciding*) more often,  $t(47) = 2.06$ ,  $p = .045$ ,  $d = 0.30$ , and one strategy (*anticipate regret*) less often,  $t(47) = -2.48$ ,  $p = .017$ ,  $d = -0.36$ .

In sum, there was also no evidence that participants assigned to the proactive strategies and reactive strategies condition started using the strategies they learned about more often during the month than they had already done at intake (T1). However, it is possible that participants' report on strategy use does not reflect actual strategy use accurately, as it was judged on subjective Likert scales rather than observed actual instances of strategy use. Learning about strategies might have increased strategy use from – for example – five times per week to six times per week, both of which might be described as using strategies “occasionally” on the Likert scale. However, using a strategy even one more time per week might reduce spending over the course of a month. Thus, I will still examine possible condition differences as planned.

### ***Monthly Spending Relative to Goals***

I next examined the effect of condition on bringing spending in line with goals. In an ANCOVA, I entered condition as predictor variable and actual monthly spending in August as

outcome variable, controlling for spending goal for August.<sup>6</sup> The overall test showed no significant difference between all four conditions,  $F(3, 292) = 0.25, p = .860, \text{partial } \eta^2 = .003$ . I also examined the pre-planned contrasts comparing each of the willpower and strategy conditions to the control group. Compared to the control condition, there was no significant difference in monthly spending with the willpower condition ( $B = -176.53, 95\% \text{ CI } [-663.22; 3], p = .515$ ), proactive condition ( $B = 9.54, 95\% \text{ CI } [-469.79.07; 488.86], p = .969$ ), or reactive condition ( $B = -34.89, 95\% \text{ CI } [-533.82; 464.05], p = .891$ ). This suggests that being instructed to use willpower, proactive strategies, or reactive strategies did not significantly decrease spending during the month compared to being given no instructions. Mean spending goals, actual spending, and difference scores between the two are presented in Table 6.

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<sup>6</sup> The preregistration states my key dependent variable is “money spent in the month of August (controlling for spending goal for August)”, implying an ANCOVA. In the analyses section of the preregistration I did not explicitly state that I will be controlling for the August spending goal when assessing spending over the month. However, as the purpose of this study is to assess monthly spending in relation to a monthly spending goal, an ANCOVA is an appropriate technique.

**Table 6***Mean Spending Goals and Reported Spending By Condition and Survey*

	Control condition <i>M (SE)</i>	Willpower condition <i>M (SE)</i>	Proactive condition <i>M (SE)</i>	Reactive condition <i>M (SE)</i>	Across conditions <i>M (SE)</i>
<i>August</i>					
Spending goal (T1)	\$2,148.48 (185.03)	\$2,339.36 (226.34)	\$2,319.89 (209.32)	\$2,454.68 (248.76)	\$2,315.21 (108.75)
Actual spending (T2)	\$2,331.07 (237.30)	\$2,298.61 (240.06)	\$2,469.98 (220.59)	\$2,527.30 (261.70)	\$2,406.23 (119.13)
Difference (T2-T1)	+\$182.59 (166.22)	-\$40.75 (242.57)	+\$150.09 (137.74)	+\$72.61 (160.77)	+\$91.03 (90.45)
<i>September</i>					
Spending goal (T2)	\$2,192.76 (193.93)	\$2,138.00 (223.46)	\$2,792.04 (251.56)	\$2,254.11 (249.85)	\$2,339.29 (114.94)
Actual spending (T3)	\$2,730.36 (264.79)	\$2,486.85 (259.88)	\$3,201.65 (302.99)	\$2,506.93 (237.02)	\$2,733.17 (135.10)
Difference (T3-T2)	+\$537.61 (182.95)	+\$348.85 (178.23)	+\$409.62 (216.28)	+\$252.82 (215.98)	+\$393.88 (98.23)
<i>Daily reports in August</i>					
Mean actual spending	\$76.50 (10.66)	\$95.49 (10.84)	\$87.56 (10.67)	\$91.32 (11.07)	\$87.57 (5.39)

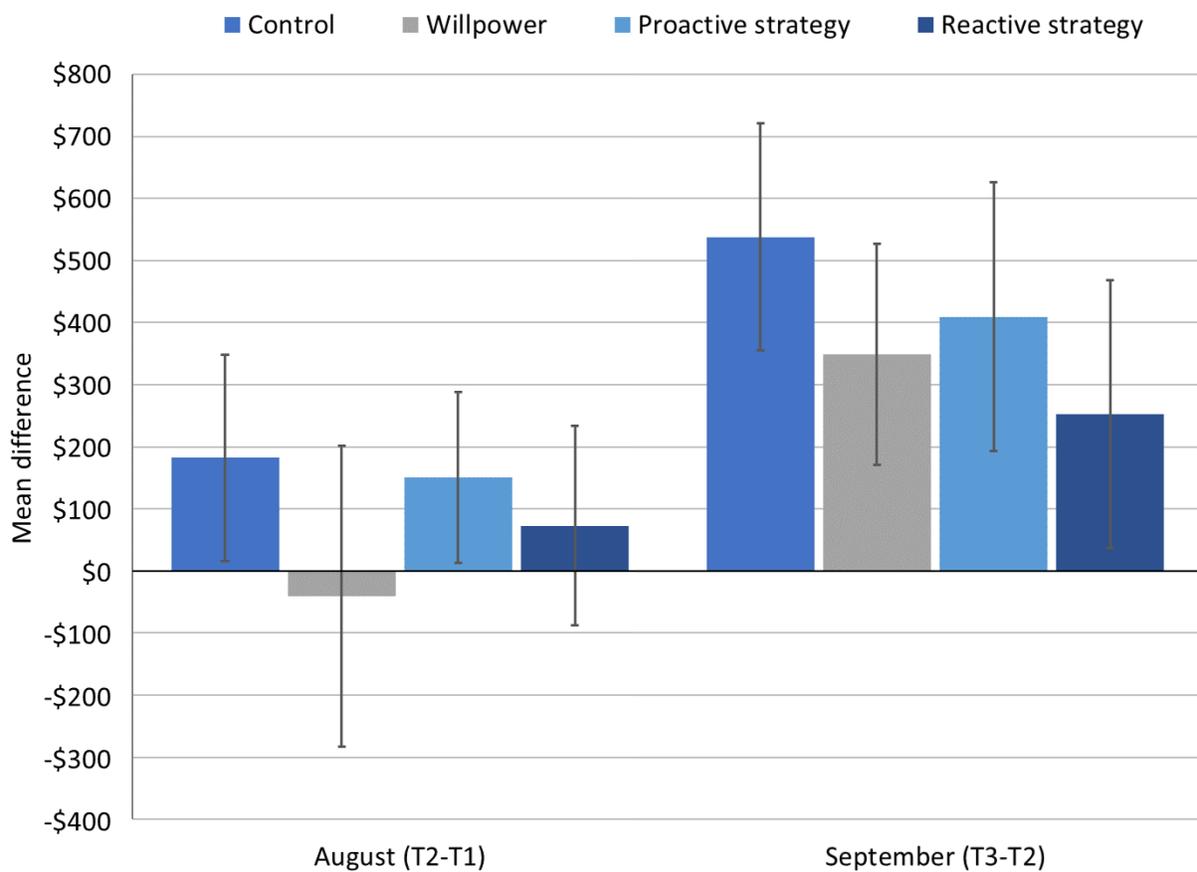
*Note.* Spending goal refers to the spending goal participants reported for the following month (i.e., spending goal in the T2 survey asks about the participant's spending goal for September). A positive mean difference shows participants' monthly spending was greater than their goal. A negative mean difference shows participants' monthly spending was less than their goal.

I also examined the effect of condition on bringing spending in line with goals during the second month. In an ANCOVA, I entered condition as predictor variable and actual monthly spending in September as outcome variable, controlling for spending goal for September (not preregistered). The overall test showed no significant difference between all four conditions,  $F(3, 206) = 0.47, p = .707, \text{partial } \eta^2 = .007$ . The pre-planned contrasts comparing each of the willpower ( $B = 198.56, 95\% \text{ CI } [-322.86; 719.99], p = .453$ ) and strategy (proactive:  $B = 20.59, 95\% \text{ CI } [-515.34; 556.52], p = .940$ ; reactive:  $B = 273.79, 95\% \text{ CI } [-275.48; 823.06], p = .327$ ) conditions to the control group were not significant.

Next, I examined participants' actual spending over the month of August (T2) relative to their spending goals for this month (T1) via paired sample t-tests (not preregistered). Overall, across conditions, participants spent only an average \$91.03 more in August than they had intended, which was not significant,  $t(296) = 1.01, p = .315, d = 0.06$ . Intended and actual spending did not significantly differ in any of the four conditions (control condition:  $t(70) = 1.10, p = .276, d = 0.13$ ; willpower condition:  $t(75) = -0.17, p = .867, d = -0.02$ ; proactive strategy condition:  $t(80) = 1.09, p = .279, d = 0.34$ ; reactive strategy condition:  $t(68) = 0.45, p = .653, d = 0.05$ ). See Figure 7 for the mean difference between participant's actual spending and spending goals, by condition.

**Figure 7**

*Mean Differences Between Actual Spending and Spending Goals By Condition – Study 3*



*Note.* A positive mean difference shows participants' reported monthly spending was greater than their goal and a negative mean difference shows participants' reported monthly spending was less than their goal. Standard error bars represent 1 *SE*.

I also examined participants' actual spending over the month of September (T3) relative to their spending goals for this month (T2) via paired sample t-tests (not preregistered). Overall, across conditions, participants spent an average \$393.88 more in September than they had intended, which was significant,  $t(210) = 4.01, p < .001, d = 0.28$ . This difference between intended and actual spending between the conditions was significant only in the control

condition,  $t(56) = -2.94, p = .005, d = -0.39$ , but was not significant in the willpower condition,  $t(55) = -1.96, p = .055, d = -0.26$ , not significant in the proactive condition,  $t(51) = -1.89, p = .064, d = -0.26$ , and not significant in the reactive condition,  $t(45) = -1.17, p = .248, d = -0.17$ .

Overall, participants overspent compared to their goal more in September than in August. This difference was not significant, however. In paired t-test across conditions, the difference score for actual spending and spending goals across conditions was not significantly different for September and August:  $t(204) = -1.19, p = .237, d = -0.08$ . The difference scores were negatively correlated,  $r = -.23, p = .001$ , suggesting that people who overspent more in August overspent less in September.

### ***Daily Spending (Sampled Daily Reports in August)***

I next examined whether any condition differences were present in daily spending reports ( $N = 2975$  across 384 participants); 82.3% of the variance in total spending was within-person and 17.7% was between-person. Given that spending reports were nested within person, I conducted 2-level multilevel analyses controlling within-person variance using the MIXED command in SPSS (this was a preregistered analysis). I entered total spending that day as the dependent variable and the condition variable as the categorical predictor variable (control vs. willpower vs. proactive strategies vs. reactive strategies). The overall model was not significant,  $F(3, 324.46) = 0.58, p = .631, partial \eta^2 = .005$ . The control group did not differ from the willpower group,  $B = -19.00, 95\% CI [-48.91; 10.92], p = .212$ , from the proactive strategy group,  $B = -11.06, 95\% CI [-40.77; 18.66], p = .465$ , or the reactive strategy group,  $B = -14.82, 95\% CI [-45.06; 15.42], p = .336$ .

***Reported Strategy Use and Spending***

**Strategy Use and Spending (Monthly).** In exploratory (not preregistered) analyses, I next examined whether participants' strategy use was related to the difference between their actual spending and their spending goal. See Table 7 for the correlations. A correlation of participants' frequency of use for willpower, the three proactive strategies, and the three reactive strategies with their difference between actual and intended spending in August revealed only the proactive strategy of *limit access* was significantly negatively correlated with spending ( $r = -.13$ ,  $p = .030$ ). The more often participants used the *limit access* strategy, the smaller the spending difference and the closer they came to their spending goal. There were no significant correlations between willpower, proactive strategies, or reactive strategies use and spending difference in September ( $r_s < -.13$ ,  $p_s > .056$ ). The effects on spending difference are consistent when entering willpower, the three proactive strategies, and the three reactive proactive strategies as predictors in a regression instead.

**Table 7***Correlation of Strategy Use and Overspending*

	August spending difference (T2-T1)	September spending difference (T3-T2)
Willpower	< .01	-.13
Proactive: Avoid places	-.02	-.05
Proactive: Limit access	-.13*	-.11
Proactive: Plan purchases	< -.01	-.12
Reactive: Need vs. want	.07	-.08
Reactive: Wait	-.04	-.02
Reactive: Anticipate regret	-.01	-.05

*Note.* Strategy use was measured in the exit survey (T2) for August correlations and in the follow-up survey (T3) for September correlations. \* represents correlation is significant at the 0.05 level.

**Strategy Use and Spending (Daily Sample Reports).** In exploratory (not preregistered) analyses, I examined whether self-reported strategy use in the proactive and reactive conditions was linked to daily spending. For this analysis I focused on the two strategy conditions only ( $N = 1465$ ), as participants in the control and willpower condition did not report on strategy use in the daily reports. The variance in the number of strategies used was 61.7% within-person and 38.3% was between-person. Per diary report, the average number of strategies used (ranging from 0 to 4, including the participant described strategy) in the reactive condition ( $M = 1.46$ ,  $SE = 0.10$ ) was significantly greater than in the proactive condition ( $M = 1.13$ ,  $SE = 0.10$ ),  $F(1, 171.28) = 5.09$ ,  $p = .025$ ,  $partial \eta^2 = .029$ . Participants in the proactive condition reported using the strategy *avoid places* in 18.5% ( $n = 141$ ) of diary reports, *limit access* in 13.5% ( $n = 103$ ) of diary reports, *plan purchases* in 41.7% ( $n = 317$ ) of diary reports, an unlisted additional strategy in 9.3% ( $n = 71$ ) of diary reports, and no strategy in 31.0% ( $n = 236$ ) of diary reports. Participants in the reactive condition reported using the strategy *need vs. want* in 45.9% ( $n = 323$ ) of diary reports, *wait before deciding* in 21.7% ( $n = 153$ ) of diary reports, *anticipate regret* in 23.3% ( $n = 164$ ) of diary reports, an unlisted additional strategy in 11.5% ( $n = 81$ ) of diary reports, and no strategy in 38.1% ( $n = 268$ ) of diary reports.

Then I examined whether the number of strategies used was linked with the amount of money spent during the day (controlling the number of spending situations encountered, since this would be predictive of both). The number of strategies used was not significantly related to spending that day, while controlling for the number of spending situations encountered, neither in the proactive condition,  $F(1, 531.60) = 0.08$ ,  $p = .776$ ,  $partial \eta^2 < .001$ , or in the reactive condition,  $F(1, 559.93) = 1.49$ ,  $p = .223$ ,  $partial \eta^2 = .003$ .

***Exploratory: Spending Effects on Feeling Happy***

In further exploratory (not preregistered) analyses, I examined whether the condition, spending more money overall, or using more strategies was linked to participants reports of happiness in the daily reports. Given the well-established effect of spending money on others and happiness (Dunn et al., 2011, 2014), I also examined whether participants were happier on days they spent money on other people (24.6% of daily reports included a purchase made for others). I conducted 2-level multilevel analyses controlling within-person variance using the MIXED command in SPSS. In an analysis including condition, total spending, and spending money on others (0 = *No*, 1 = *Yes*) as predictors, and happiness as dependent variable, I found no significant effect of condition on happiness,  $B = -0.002$ , 95%  $CI [-0.11; 0.11]$ ,  $t(374.48) = -0.03$ ,  $p = .979$ , no significant effect of total spending on happiness,  $B = 0.0001$ , 95%  $CI [-0.00005; 0.0003]$ ,  $t(2683.10) = 1.49$ ,  $p = .138$ , but a positive significant effect of spending money on others on happiness,  $B = 0.16$ , 95%  $CI [0.07; 0.25]$ ,  $t(2758.24) = 3.52$ ,  $p < .001$ . People were happier on days they spent money on others ( $M = 4.97$ ,  $SE = 0.07$ ) than on days they did not ( $M = 4.80$ ,  $SE = 0.07$ ).

In an analysis including condition and the number of strategies used that day as predictors, and happiness as dependent variable, I found no significant effect of condition on happiness,  $B = -0.17$ , 95%  $CI [-0.52; 0.18]$ ,  $t(185.59) = -0.95$ ,  $p = .342$ , but a significant effect of using more strategies on happiness,  $B = 0.11$ , 95%  $CI [0.06; 0.17]$ ,  $t(1449.11) = 3.92$ ,  $p < .001$ . People were happier on days they used more strategies. The effect of using more strategies on happiness remained marginally significant when controlling for the number of spending situations encountered,  $B = 0.07$ , 95%  $CI [-0.004; 0.15]$ ,  $t(1427.31) = 1.86$ ,  $p = .063$ .

***Exploratory: Typicality of the Month***

Considering this study was conducted during the COVID-19 pandemic, I also examined participants' reports of how typical the month was in terms of their experiences and spending, both in general and since the COVID-19 pandemic began (not preregistered). An overall test showed there were no significant difference between the conditions for how typical the month was in terms of participants' experiences in general  $F(3, 296) = 1.12, p = .342, \text{partial } \eta^2 = .011$ , participants' experiences since the pandemic began  $F(3, 296) = 2.19, p = .090, \text{partial } \eta^2 = .022$ , participants' spending in general ( $F(3, 298) = 1.68, p = .170, \text{partial } \eta^2 = .017$ ), and participants' spending since the pandemic began ( $F(3, 298) = 0.46, p = .711, \text{partial } \eta^2 = .005$ ). Including the typicality of the month in terms of spending (both in general and since the pandemic began) as covariates in main test of the condition effect on monthly spending did not change the null findings of the condition effect,  $F(3, 294) = 0.77, p = .513, \text{partial } \eta^2 = .008$ .

***Exploratory: Correlations***

See Table 8 for a correlation matrix of monthly actual spending, individual strategy use, and willpower use at T2 with T1 demographics, trait self-control, personality (extraversion, agreeableness, openness, conscientiousness, and neuroticism)<sup>7</sup>, and with T2 individual strategy use, monthly actual spending, and emotions (positive affect and negative affect). I do not discuss these correlations in detail because they are highly exploratory (not preregistered) and are only a selection of the plethora of possible relationships I could examine given the large number of variables in this study. To highlight just a few potentially interesting findings, correlations of

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<sup>7</sup> I assessed personality the Big Five personality traits with the Ten-Item Personality Inventory (TIPI; Gosling et al., 2003) because it is a quick assessment. There have been concerns of low internal consistency (Brito-Costa et al., 2015) and the reliability of the agreeableness measure (Ehrhart et al., 2009) with the TIPI. Therefore, the exploratory personality findings should be interpreted with caution.

spending with demographic indicators (age, education, and income) showed that older, more educated, and higher income participants spent more money. Trait self-control was also significantly correlated to monthly spending, but this was a positive correlation, suggesting the greater a person's trait self-control, the *more* they spent during the month. This link may be an artifact of demographic correlates, however, as trait self-control was also significantly positively correlated with age ( $r = .26, p < .001$ ). Finally, there was a significant positive association between reporting having used willpower more often in the month of August and having used the three proactive and three reactive strategies more often, as reported at T2. These correlations may suggest that people who relied on 'willpower' may still be using strategies in self-control conflicts. Trait self-control was inconsistently linked with the different strategies, suggesting that people with high self-control use some strategies more often (*plan purchases, need vs. want*) and some strategies less often (*avoid places, limit access, wait before deciding, anticipate regret*).

**Table 8**

*Exploratory Correlation Matrix for Study 3*

	<i>Exit survey (T2)</i>									
	Willpower	Avoid places	Limit access	Plan purchases	Need vs. want	Wait	Anticipate regret	Positive affect	Negative affect	August actual spending
<i>Intake survey (T1)</i>										
Age	.01	-.02	-.22**	.13*	.09	-.18**	-.06	.06	-.13*	.21**
Education	.17**	.12*	.12*	-.01	.02	.10	-.05	.06	.04	.21**
Income	.03	.05	.01	.05	-.02	.06	-.08	.20**	-.15*	.48**
Financial stress	.09	.18**	.22**	-.08	.02	.10	.19**	-.29**	.44**	-.21**
Trait self-control	-.06	-.15*	-.23**	.17**	.19**	-.17**	-.15*	.28**	-.53**	.15**
Extraversion	.13*	.16**	.23**	.07	.07	.10	.04	.32**	-.06	.03
Agreeableness	-.11	-.12*	-.18**	.01	.08	-.19**	-.10	.10	-.31**	.04
Openness	-.07	-.16**	-.29**	.14*	.15**	-.20**	-.16**	.15**	-.46**	.12*
Conscientiousness	-.06	-.14*	-.11	.07	.10	-.15**	-.19**	.37**	-.49**	.11
Neuroticism	.003	.05	-.08	.14*	.14*	-.11	.01	.16**	-.23**	.05
<i>Exit survey (T2)</i>										
Willpower	1									
Avoid places	.42**	1								
Limit access	.34**	.42**	1							
Plan purchases	.20**	.24**	.09	1						
Need vs. want	.35**	.29**	.08	.37**	1					
Wait use	.23**	.22**	.36**	.11	.26**	1				
Anticipate regret	.30**	.32**	.29**	.09	.40**	.43**	1			
Positive affect	.13*	.15*	.20**	.13*	.13*	.09	-.01	1		
Negative affect	.23**	.19**	.34**	.02	-.01	.25**	.25**	-.26**	1	
August actual spending	-.02	.002	-.20**	.03	.05	-.08	-.09	.09	-.19**	1

*Note.* \* represents significant at the 0.05 level (2-tailed). \*\* represents significant at the 0.01 level (2-tailed). Proactive strategies:

avoid places limit access, and plan purchases. Reactive strategies: need vs. want, wait, and anticipate regret.

## Discussion

This study examined how being instructed to use proactive or reactive strategies influenced spending over the course of a month. Past research would suggest that strategies are generally effective at reducing spending with a medium effect size (see meta-analysis). Overall, I found no significant differences between intended spending and actual spending when using proactive strategies, reactive strategies, or willpower compared to a control condition. In August, people received 10 diary reports which asked them to report on their strategy use and spending. In September, people were only asked to report on their strategy use and spending at the start and at the end of the month. People's spending across conditions was closer to their spending goals in August than in September (see Figure 7), suggesting tracking spending in the diary reports may have helped people stay in line with their goals, but the condition manipulation did not have an added impact on spending.

Self-control models would suggest that proactive strategies are superior to reactive strategies because they remove or restrict temptations before a person even encounters a potentially tempting situation (Duckworth et al., 2014; Hofmann & Kotabe, 2012). However, I found proactive strategies were not superior to reactive strategies for bringing spending in line with people's goals. Proactive and reactive strategy use did not differ across the conditions in the monthly measures, but I did find people in the reactive conditions used more strategies than people in the proactive condition as reported in the daily reports. This may suggest that people spontaneously use more reactive than proactive strategies.

A possible explanation of the null findings on strategy effectiveness may be that the proactive and reactive strategy manipulations were not strong enough to encourage people to use more of these strategies (as opposed to other strategies that were not described in their condition)

in their daily life. A better approach may be to ask people what strategies they already use (Peetz & Davydenko, 2021). For example, it may be a more engaging manipulation if people describe the strategies they use as opposed to read about them. By asking people to describe the proactive or reactive strategies they already use, I could also assess differences in spontaneous proactive or reactive strategy use on spending. The strategies people describe may have better fit with their personality and lifestyle.

#### **Study 4: Personal Self-Control Strategies and Effectiveness Over Time**

Similar to the previous study, I compared the effectiveness of proactive and reactive financial self-control strategies on reducing spending over the course of a month. The strategy manipulation was changed in several ways from the previous study to address some of the limitations of Study 3. First, I briefly explained self-control strategies and gave several examples of financial strategies in a video that participants watched. Presenting this information as a video rather than text (as in Study 3) might make it more engaging, memorable, and effective as a manipulation. Second, unlike Study 3 where I asked participants to report on six pre-determined strategies, I asked participants in this study to describe the proactive and reactive strategies they already use. Asking participants to describe their own strategies is more interactive, and it might allow for greater flexibility in strategy use and better fit between the proactive or reactive strategy and the person's unique spending situations and lifestyle. With this change to the manipulation design, I could also examine whether participants could describe the strategies they spontaneously use in their daily life.

I expected participants who described the proactive strategies they use to spend less over the course of the month (relative to their spending goals) than those who did not describe their strategy use or those who described reactive strategies. Unlike Study 3, this study did not include

a condition in which participants focused only on willpower; as the previous study suggested, people who were instructed to use willpower still spontaneously used strategies, making the willpower condition difficult to interpret. In exploratory analyses, I again examine the consequences of using strategies on the types of purchases people made throughout the month and their emotional state. See Appendix E for the preregistration (<https://aspredicted.org/blind.php?x=p57z2n>), the full study materials, and a link to the data.

## **Method**

### ***Participants***

A sample of 360 participants would detect a small to medium effect ( $f \geq 0.17$ ) between three groups with 80% power. I overrecruited to account for attrition (expecting about 40% attrition) and exclusions and posted 600 slots on MTurk. This study was approved by the Carleton University Research Ethics Board – B. By participating in this study participants could earn up to \$6.50 USD in compensation (\$0.50 for the intake survey, \$0.50 for each of the 10 diary reports, and \$1.00 for the exit survey). All surveys were completed through Qualtrics.

Six hundred and three Canadian and American MTurk workers completed the intake survey on the first day of the month (March 1, 2021); the minimum MTurk approval rate to participate in this study was 97%. As preregistered and consistent with the previous study, seven participants (1.2%) were excluded for writing nonsense in the open-ended item about the strategies they use (proactive and reactive conditions) or about recent spending situations (control condition) in the intake survey, and 35 participants (5.8%) were excluded who reported a monthly spending goal that was double their monthly income.

Of the remaining 562 participants, 381 (67.8%) completed the exit survey on or after March 31<sup>st</sup>. Exit survey completion did not differ by condition,  $\chi^2 (N = 562, df = 2) = 0.17, p =$

.919. In line with preregistered criteria, 10 participants were excluded who reported monthly spending that was double their monthly income. I also excluded six monthly spending values as outliers ( $+3 SD$ ) and four monthly spending values were missing in the exit survey. Thus, the total number of valid exit spending reports was 362 (control condition:  $n = 125$ ; proactive condition:  $n = 118$ ; reactive condition:  $n = 119$ ).

Participants were on average 41.52 years old ( $SD = 13.11$ ; 53.3% male, 46.5% female; 80.7% white). Over half (55.4%) had an undergraduate degree or higher, the average annual personal income was \$40,000-49,999, 66.9% worked full time, 28.6% lived in single households by themselves, 45.2% were married or living with a common-law partner, and 34.9% had children living with them.

In addition to the intake and exit surveys, I also sampled strategy use and spending on several days throughout the month. Participants were contacted 10 times during the month and were prompted to complete a daily report. Of the total 3,605 daily reports completed, I excluded seven daily spending values as outliers ( $+3 SD$ ) and there was one missing spending value. I did not exclude reports that left the strategy description blank, and no reports wrote nonsense in their strategy description. Thus, the total number of reports containing valid daily spending values is 3,597 from 500 participants. The average number of daily reports completed by participants was 7.19 ( $SE = 0.14$ ), and 59.8 % ( $n = 299$ ) completed eight or more diary reports (20.2 %,  $n = 101$ , completed three or fewer diary reports). The number of reports participants completed did not differ by condition,  $F(2, 497) = 0.18, p = .839$ .

### **Procedure**

Like Study 3, this study assessed participants at several points in time. The intake (T1), diary, and exit (T2) surveys in this study were collected in the same way as in Study 3. However,

this study did not assess spending and strategy use in a follow-up survey (T3). The study design presented in Figure 6 also applies to this study, with the exception of the follow-up survey (T3).

### ***Intake Survey (T1)***

On the first day of the month (March 1, 2021), participants completed the intake survey (T1). After agreeing to participate in the study in the informed consent form, participants completed the same demographic survey as in Study 3. Next, as in Study 3, they reported their total annual personal income before taxes, how stressed they feel about their financial situation, how much control they feel they have over their income, and the revised version of the Financial Capability Scale (Robson & Splinter, 2015). See Table E1 in Appendix E for descriptive information about the sample's demographics and financial capabilities.

**Spending Variables.** Next, all participants reported their spending goal for the month (March), as a dollar value in an open-ended text box.<sup>8</sup> They were instructed to include both basic living expenses (e.g., mortgage) and discretionary spending (e.g., entertainment) in their goal.

**Strategy Conditions.** Participants were then randomly assigned to one of three conditions. Participants in the *proactive strategies condition* were shown a video (<https://youtu.be/iNExzT64Vhk>) about examples of proactive strategies they could be using in their daily life: *avoiding tempting places* (e.g., Duckworth et al., 2016; Hofmann et al., 2012; Milyavskaya et al., 2015), *limiting access to money* (e.g., Somville & Vandewalle, 2018), and *creating a plan or budget* (e.g., Cheema & Soman, 2006; Pennings et al., 2005; Sheehan & Van Ittersum, 2018). The video was 90 seconds long and participants could not continue to the next

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<sup>8</sup> Participants reported spending in dollars without specifying if their goal or actual spending was in Canadian (CAD) or American (USD) currency. I also did not record participants' current country of residence. The difference in value between CAD and USD may have introduced additional variance in the spending goal and monthly spending variables. On March 31, 2021, \$1 CAD = \$0.79 USD.

page until 90 seconds passed. Next, participants were asked to describe three strategies they personally use before they encounter a spending temptation in three open-ended text boxes. They rated how often they currently use each strategy (1 = *Never*, 2 = *Rarely*, 3 = *Occasionally*, 4 = *Most of the time*, 5 = *All the time*) and when they use this strategy in general (1 = *Mostly before a spending temptation* to 5 = *Mostly during a spending temptation*). Finally, participants in the proactive condition were reminded of the three strategies they described and were encouraged to try to use these strategies more often in their daily life.

Participants in the *reactive strategies condition* were shown a video (<https://youtu.be/deulpV4kPhc>) about examples of reactive strategies they could be using in their daily life: *imagining your future self* (e.g., Ersner-Hershfield et al., 2009, 2011), *thinking about the reasons for the goals* (e.g., Rudzinska-Wojciechowska, 2017), and *anticipating regret* (e.g., Keinan & Kivetz, 2008). The video was 90 seconds long and participants could not continue to the next page until 90 seconds passed. Next, participants were asked to describe three strategies they personally use during a spending temptation in three open-ended text boxes. As in the proactive strategies condition, they rated how often they currently use each strategy and when they use each strategy. Finally, participants in the reactive condition were reminded of the three strategies they described and were encouraged to try to use these strategies more often in their daily life.

For both the proactive and reactive condition, I computed mean strategy use across the three strategies described in each condition. Aggregating how often participants used the individual strategies by proactive condition ( $\alpha = .56$ ) and reactive condition ( $\alpha = .73$ ) yielded moderate reliability.

In the *control condition*, participants were not shown any videos and were not asked to describe any strategies. Participants in the control condition were asked to describe three recent spending situations in three open-ended text boxes.

Participants also completed exploratory scales on trait self-control (Tangney et al., 2004) and emotion (positive affect and negative affect, Diener et al., 2009), but these questionnaires were not used in the main analysis. See Table E1 in Appendix E for mean values on these exploratory scales. Finally, participants selected whether they wanted to receive email reminders about the diary reports. All participants who completed the intake survey (T1) were eligible to participate in all following surveys through MTurk.

### ***Sampled Daily Reports***

Participants were emailed in the evening 10 times throughout the month to report on their spending experiences that day. For each of these reports, participants first reported how many spending situations they had encountered that day where they made a purchase (0 / 1 / 2 / 3 / 4 / 5 or more) and how many situations where they were tempted to spend, but ultimately did not spend (0 / 1 / 2 / 3 / 4 / 5 or more). Participants encountered on average 1.24 spending situations ( $SE = 0.04$ ) per diary report; there was no significant difference in the number of spending situations encountered by condition,  $F(2, 444.51) = 1.20, p = .301$ . Per diary report, participants also encountered on average 0.83 situations ( $SE = 0.04$ ) where they were tempted to but ultimately did not spend money; there was no significant difference by condition,  $F(2, 442.11) = 0.49, p = .612$ .

Next, only participants in the proactive and reactive strategy conditions reported on self-control strategies use. Participants described up to three strategies they had used before encountering the spending situations (proactive condition) or up to three strategies they used

during a spending situation (reactive condition) or selected that they did not use any strategies for that spending situation (both conditions). In both the proactive and reactive conditions, participants then rated how often they used each strategy they described (1 = *Never*, 2 = *Rarely*, 3 = *Occasionally*, 4 = *Most of the time*, 5 = *All the time*). Participants in the control condition did not describe or report on any strategies.

Next, all participants reported how much they spent in dollars and how many purchases they made in total that day. Finally, in exploratory variables, participants reported how many of those purchases were intended for others, intended for themselves, made online, and made in person. Finally, participants reported how tired and how happy they felt in the moment, on single items (1 = *Not at all* to 7 = *Extremely*).

### ***Exit Survey (T2)***

On the last day of the month (March 31, 2021), participants were contacted in the evening for the exit survey (T2). They reported how much they spent in total during last month (March), including both basic expenses and discretionary spending. They reported this in an open-ended text box, in dollars. Next, all participants reported on how often they had used each of six strategies (those that were described in the videos shown in the proactive and reactive conditions) on 5-point Likert scales (1 = *Never* to 5 = *All the time*). Next, all participants described what other strategies they had used during the last month in three open-ended text boxes and rated how often they used each strategy they described (1 = *Never* to 5 = *All the time*). On average, participants described 2.40 additional strategies ( $SE = 0.05$ ), and there was no difference by condition for the number of additional strategies described,  $F(2, 359) = 1.12, p = .327, \text{partial } \eta^2 = .006$ . Participants also rated “Over the month, did you use the strategies mostly before you encountered a spending temptation (e.g., before going to a store, seeing the item, or

logging on an online store) or mostly during a spending temptation (e.g., once you are at the store, see the item, or once logged on an online store)?”, (1 = *Mostly before a spending situation* to 5 = *Mostly during a spending situation*).

Next, participants rated how typical this month was in terms of their experiences and actions in general and how typical it was in terms of their spending patterns in general (1 = *Not at all typical* to 7 = *Extremely typical*). Participants also reported what their spending goal was for the last month; however, over a quarter of the participants ( $n = 45$ , 28.7%) described their spending goal through text (e.g., “My goal was to save as much as I can and limit my spending.”) as opposed to estimating a dollar amount, and I did not use this item in further analyses. Finally, for exploratory purposes, participants reported on their type of goal motivation (Milyavskaya et al., 2014; Sheldon & Elliot, 1998), their emotions throughout the month (Diener et al., 2009), and their regulatory focus (Higgins et al., 2001). In the debriefing form, participants were informed of the purpose of the study and were given a link to a video about proactive and reactive strategies.

## Results

### *Initial Analyses: Manipulation Check*

First, I examined whether participants followed the instructions and described using the type of strategies that corresponded to their strategy condition (not preregistered). At T1, participants in the proactive condition reported using their written-in personal strategies more often before a spending situation ( $M = 2.21$ ,  $SE = 0.08$ ) than participants in the reactive condition ( $M = 3.26$ ,  $SE = 0.08$ ),  $t(369) = -9.64$ ,  $p < .001$ ,  $d = -1.00$ . To corroborate participants’ self-reports, I also coded each strategy participants described at T1 (0 = *Proactive strategy*, 1 = *Reactive strategy*) and summed the coding across the three reported strategies to find how many

reactive strategies were reported in each condition. Out of the three described strategies, participants described more reactive strategies in the reactive condition ( $M = 2.40$ ,  $SE = 0.06$ ) than in the proactive condition ( $M = 0.90$ ,  $SE = 0.08$ ),  $t(369) = 15.12$ ,  $p < .001$ ,  $d = 1.57$ . In other words, out of the three strategies participants described, on average two were proactive strategies in the proactive condition, and on average two were reactive strategies in the reactive condition. Participants' self-reported type of strategies positively correlated with the coding,  $r = .44$ ,  $p < .001$ .

As reported at T2, there was also a significant difference between the proactive and reactive condition for when participants reported using the written-in personal strategies over the month,  $t(359) = 3.17$ ,  $p = .002$ ,  $d = 0.41$ . Participants in the proactive condition ( $M = 2.45$ ,  $SE = 0.12$ ) reported using strategies more often before a spending situation than in the reactive condition ( $M = 2.97$ ,  $SE = 0.12$ ). In sum, I consider participants followed the strategy instructions correctly. During the month, generally, participants used proactive strategies in the proactive condition and reactive strategies in the reactive condition.

### ***Initial Analyses: Strategy Use by Condition***

Next, I examined whether the conditions affected participants' reported strategy use frequency (not preregistered). All participants reported on strategy use at T2 (at T1 only those participants assigned to the reactive or the proactive conditions rated strategy use). Means by condition are presented in Table 9. In a one-way ANOVA, I entered condition as the predictor variable and the use of the three proactive strategies from the video (*avoid places, limit access, plan purchases*), the use of three reactive strategies from the video (*anticipate regret, reason for goal, future self*), and the mean use of the strategies participants described as outcome variables. I found there were significant differences between the conditions for strategy use for the

following strategies: *avoid places*,  $F(2, 359) = 3.37, p = .036, \text{partial } \eta^2 = .018$ ; *limit access*,  $F(2, 359) = 3.19, p = .043, \text{partial } \eta^2 = .017$ ; and *anticipate regret*,  $F(2, 359) = 3.83, p = .023, \text{partial } \eta^2 = .021$ . There were no significant differences between the conditions for strategy use for the following strategies: *plan purchases*,  $F(2, 359) = 0.25, p = .783, \text{partial } \eta^2 = .001$ ; *reasons for goal*,  $F(2, 359) = 1.91, p = .150, \text{partial } \eta^2 = .011$ ; and *future self*,  $F(2, 359) = 1.73, p = .179, \text{partial } \eta^2 = .010$ .

**Table 9**

*Mean Ratings for Strategy Use at T1 and T2 by Condition*

	T1 survey <i>M (SE)</i>		T2 survey <i>M (SE)</i>		
	Proactive condition	Reactive condition	Control condition	Proactive condition	Reactive condition
Avoid places	-	-	2.87 (0.11)	3.18 (0.11)	3.23 (0.10)
Limit access	-	-	1.89 (0.11)	2.27 (0.12)	1.99 (0.11)
Plan purchases	-	-	3.54 (0.12)	3.52 (0.13)	3.63 (0.12)
Anticipate regret	-	-	3.55 (0.11)	3.49 (0.11)	3.88 (0.10)
Reasons for goal	-	-	3.66 (0.11)	3.49 (0.12)	3.79 (0.09)
Future self	-	-	3.73 (0.11)	3.45 (0.12)	3.66 (0.10)
Mean of written-in personal strategies	4.21 (0.06)	4.13 (0.06)	4.19 (0.08)	3.79 (0.11)	3.78 (0.10)

*Note.* All ratings were on 5-point scales (0 = *Never* to 5 = *All the time*). The variable ‘Mean of written-in personal strategies’ represents the mean strategy use of each strategy participants described.

Contrasts revealed participants used the strategy *avoid places* significantly more often in the proactive condition than the control condition,  $t(359) = 2.05, p = .041, d = 0.26$ , significantly more often in the reactive condition than the control condition,  $t(359) = 2.39, p = .018, d = 0.31$ , and there was no significant difference between the proactive and reactive condition,  $t(359) = 0.32, p = .746, d = 0.04$ . Participants used the strategy *limit access* significantly more often in the proactive condition than the control condition,  $t(359) = 2.45, p = .015, d = 0.32$ , and there was no significant difference between the reactive and control condition,  $t(359) = 0.66, p = .507, d = 0.09$ , or the proactive and reactive condition,  $t(359) = 1.77, p = .078, d = 0.23$ . Participants used the strategy *anticipate regret* significantly more often in the reactive condition than the control condition,  $t(359) = 2.20, p = .029, d = 0.28$ , significantly more often in the reactive condition than the proactive condition,  $t(359) = 2.56, p = .011, d = 0.33$ , and there was no significant difference between the proactive and control condition,  $t(359) = 0.41, p = .688, d = 0.05$ .

In other words, this analysis showed some additional evidence that the condition manipulation shifted strategy use as intended. Participants in the proactive conditions used the proactive strategies of *limit access* more often and participants in the reactive condition used the reactive strategy *anticipate regret* more often than the other conditions. Participants in the control condition received no instructions to use strategies, but their reported strategy use of the *plan purchases, reasons for goal, and future self* strategies was similar to the other conditions – this suggests people use strategies spontaneously as often as when they are explicitly instructed to use strategies.

There was also a significant difference in strategy use frequency between the conditions for the three strategies all participants described at T2,  $F(2, 347) = 5.93, p = .003, partial \eta^2 = .033$ . Participants used these strategies significantly more often in the control condition than the

proactive condition,  $t(347) = 2.95, p = .003, d = 0.39$ , significantly more often in the control condition than the reactive condition,  $t(347) = 3.00, p = .003, d = 0.39$ , and there was no significant difference between the proactive and reactive condition,  $t(347) = 0.03, p = .974, d < 0.01$ . I also examined the extent to which people changed in their reported use of these written-in personal strategies from T1 to T2 (only in those conditions that required participants to list their strategies at T1). At T1, participants reported on how often they used strategies in general, but at T2, they reported on how often they used strategies during March. A paired samples t-test of strategy use at T1 versus T2 showed significant differences between how frequently people reported using the written-in personal strategies (respectively, in the two conditions) at T1 and at T2: proactive strategies,  $t(114) = 3.56, p = .001, d = 0.33$ , and reactive strategies,  $t(117) = 3.52, p = .001, d = 0.32$ . In both conditions, participants reported using the written-in personal strategies less frequently at T2 than T1. This difference should be interpreted cautiously because participant responses may differ when they rate their behaviour in general and their behaviour during a set time.

### ***Monthly Spending Relative to Goals***

I examined the effect of condition on bringing spending in line with goals: In an ANCOVA, I entered condition as predictor variable and actual monthly spending in March as outcome variable, controlling for spending goal for March.<sup>9</sup> The overall test showed a significant difference between all three conditions,  $F(2, 358) = 6.28, p = .002, partial \eta^2 = .034$ . I also examined the pre-planned contrasts comparing each of the strategy conditions to the control

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<sup>9</sup> As in Study 3, the preregistration stated the main dependent variable was “money spent in the month of March (controlling for the spending goal for March)”, implying an ANCOVA, but the analyses section did not specifically specify an ANCOVA. Because the purpose of the study is to assess monthly spending in relation to the monthly goal, and as such, an ANCOVA is an appropriate technique. Note that this analysis also replicates the analyses performed in Study 3.

group and comparing the proactive and reactive conditions. Compared to the control condition, there was no significant difference in monthly spending with the proactive condition ( $B = -217.59$ , 95%  $CI [-539.12; 103.94]$ ,  $p = .184$ ). There was a significant difference between the control condition and the reactive condition ( $B = 360.01$ , 95%  $CI [38.21; 681.20]$ ,  $p = .028$ ). There was also a significant difference in monthly spending between the proactive condition and the reactive condition ( $B = 577.59$ , 95%  $CI [253.74; 901.45]$ ,  $p = .001$ ). Mean spending goals, actual spending, and difference scores between the two are presented in Table 10.

**Table 10***Mean Spending Goal and Reported Spending By Condition*

	Control condition <i>M (SE)</i>	Proactive condition <i>M (SE)</i>	Reactive condition <i>M (SE)</i>	Across conditions <i>M (SE)</i>
<i>March</i>				
Spending goal (T1)	\$2,082.17 (136.11)	\$2,457.45 (146.60)	\$2,497.45 (140.43)	\$2,341.01 (81.78)
Actual spending (T2)	\$2,057.54 (149.83)	\$2,135.07 (137.89)	\$2,744.12 (188.18)	\$2,308.51 (93.47)
Difference (T2-T1)	-24.64 (126.21)	-322.37 (106.34)	+246.67 (122.71)	-32.50 (69.63)
<i>Daily reports in March</i>				
Mean actual spending	\$65.42 (6.16)	\$58.14 (6.31)	\$62.28 (6.55)	\$62.00 (3.65)

*Note.* A positive mean difference between actual spending and spending goal shows participants' monthly spending was greater than their goal; a negative mean difference shows participants' monthly spending was less than their goal.

Conditions differed by marital status,  $\chi^2 (N = 361, df = 6) = 19.12, p = .004$  and personal income,  $F(2, 359) = 6.94, p = .001$ . By chance, there were significantly more participants who

were single in the control condition ( $n = 63$ ) than in the proactive condition ( $n = 36$ ) or the reactive condition ( $n = 42$ ). Across conditions, I found participants who were single ( $M = \$1511.68$ ,  $SE = 90.41$ ) had significantly lower spending goals compared to participants who were married/common-law ( $M = \$3208.40$ ,  $SE = 127.48$ ),  $t(302) = -10.55$ ,  $p < .001$ ,  $d = -1.21$ .

Considering 50.4% of the control condition consisted of participants who were single, it is not surprising that the mean spending goal in the control condition was less than in the other conditions (proactive condition:  $t(359) = -1.89$ ,  $p = .060$ ,  $d = -0.24$ ; reactive condition:  $t(359) = -2.09$ ,  $p = .037$ ,  $d = -0.27$ ). Participants in the control condition ( $M = 4.57$ ,  $SE = 0.23$ ) also reported a significantly lower personal income than participants in the proactive condition, ( $M = 5.37$ ,  $SE = 0.26$ ),  $t(359) = 2.38$ ,  $p = .018$ ,  $d = 0.31$ , or reactive condition ( $M = 5.81$ ,  $SE = 0.24$ ),  $t(359) = 3.66$ ,  $p < .001$ ,  $d = 0.47$ . Participants' personal income in the control condition was on average in the \$30,000-\$39,000 range, while in the proactive and reactive conditions it was on average in the \$40,000-\$49,000 range. Participants' personal income was positively correlated with their monthly spending goal,  $r = .66$ ,  $p < .001$ . Therefore, the greater proportion of single, lower income participants in the control condition may account for the smaller monthly spending goal found in the control condition.

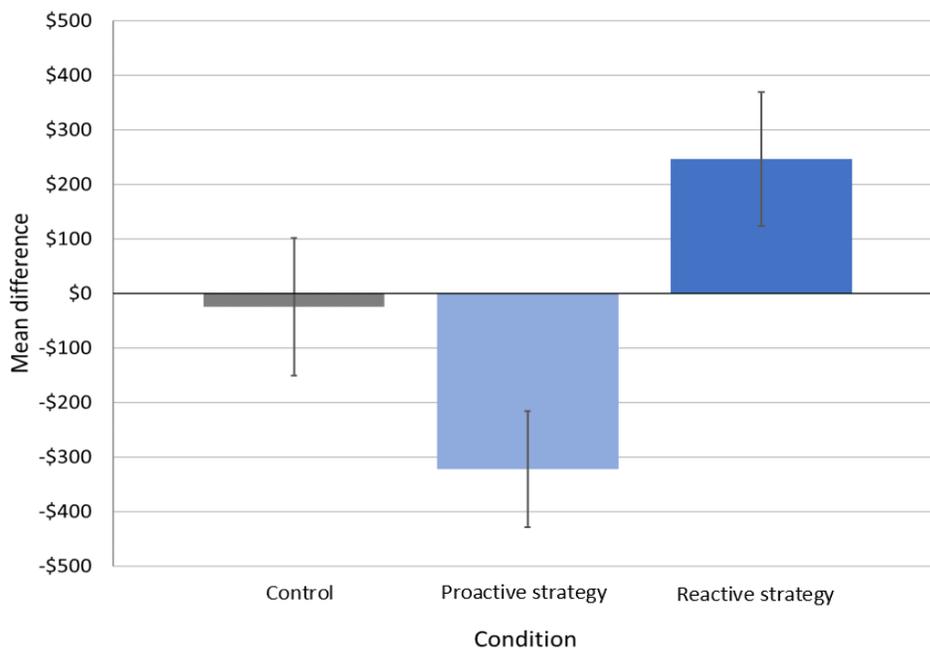
Note that this means that only two (marital status and personal income) out of 25 demographic variables differed across the conditions. No other demographic, financial capabilities, or exploratory scale variables significantly differed by condition. I consider randomization to be successful. Given that personal income and marital status likely influence spending, even relative to one's spending goal, I control for demographic variables as an exploratory analysis. The overall effect of condition on monthly spending was significant when controlling for demographic information (age, gender, personal income, education, marital

status, work status, household size),  $F(2, 322) = 4.51, p = .012, \text{partial } \eta^2 = .027$ , suggesting this is a robust effect. This suggests that using proactive strategies significantly decreased spending during the month compared to using reactive strategies.

Next, I examined participants' actual spending over the month of March (T2) relative to their spending goals for the month (T1) via paired sample t-tests (not preregistered). Across conditions, participants spent on average \$32.50 less in March than they had intended, which was not significant,  $t(361) = 0.47, p = .641, d = 0.03$ . Intended and actual spending did not significantly differ in the control condition,  $t(124) = -0.19, p = .846, d = -0.02$ . In the proactive strategy condition, participants spent significantly less than their goal,  $t(117) = -3.03, p = .003, d = -0.28$ . In the reactive strategy condition, participants spent significantly more than their goal,  $t(118) = 2.01, p = .047, d = 0.18$ ). In other words, participants who used proactive strategies spent \$322 less than they intended during the month and participants who used reactive strategies spent \$246 more than they intended during the month. See Figure 8 for the mean difference between participant's actual spending and spending goals, by condition.

**Figure 8**

*Mean Differences Between Actual Spending and Spending Goal By Condition – Study 4*



*Note.* A positive mean difference shows participants' reported monthly spending was greater than their goal and a negative mean difference shows participants' reported monthly spending was less than their goal. Standard error bars represent 1 *SE*.

### ***Daily Spending (Sampled Daily Reports in March)***

I next examined whether any condition differences were present in daily spending reports ( $N = 3,597$  from 500 participants); 90.7% of the variance in total spending was within-person and 9.3% was between-person. Given that spending reports were nested within person, I conducted 2-level multilevel analyses controlling within-person variance using the MIXED command in SPSS (this was not a preregistered analysis). I entered total spending that day as the dependent variable and the condition variable as the categorical predictor variable (control vs. proactive strategies vs. reactive strategies). The overall model was not significant,  $F(2, 466.87) = 0.34$ ,  $p = .710$ ,  $partial \eta^2 = .002$ . See Table 10 for mean daily actual spending. The control group

did not differ from the proactive strategy group,  $B = 7.28$ , 95%  $CI [-10.04; 24.60]$ ,  $p = .409$ , or the reactive strategy group,  $B = 3.14$ , 95%  $CI [-14.52; 20.81]$ ,  $p = .727$ . The proactive strategy group did not differ from the reactive strategy group,  $B = -4.14$ , 95%  $CI [-22.01; 13.73]$ ,  $p = .649$ . Although there was no significant difference between the conditions at the individual spending situation level, there was a significant difference at the month level suggesting small differences across daily spending situations may have added up to create a larger difference at the end of the month.

### ***Reported Strategy Use and Spending***

**Strategy Use and Spending (Monthly).** In exploratory (not preregistered) analyses, I next examined whether participants' strategy use was related to the difference between their actual spending and their spending goal. See Table 11 for the correlations. Correlations of participants' frequency of strategy use showed participants in the control condition who used proactive strategies (*avoid places, limit access, plan purchases*) more often had a smaller difference between their intended and actual spending. In the proactive condition, using the proactive strategies of *avoid places* and *limit access* was correlated with a greater difference between intended and actual spending. In the reactive condition, using the reactive strategy *reason for the goal* was correlated with a greater difference between intended and actual spending. The effects on spending difference are consistent when entering the individual strategies and the mean of the written-in personal strategies as predictors in a regression instead.

**Table 11***Correlation of Strategy Use Reported at T2 and Overspending*

	Mean spending difference (T2 actual - T1 goal)			
	Control condition	Proactive condition	Reactive condition	Across conditions
Mean of written-in personal strategies	.12	.17	.10	.12*
Proactive: Avoid places	-.22*	.18*	.04	-.02
Proactive: Limit access	-.33**	.20*	-.11	-.11*
Proactive: Plan purchases	-.18*	.06	.05	-.03
Reactive: Anticipate regret	-.01	.09	.06	.07
Reactive: Reason for goal	-.02	.08	.20*	.09
Reactive: Future self	-.01	.08	.01	.04

*Note.* \*\* represents correlation is significant at the 0.01 level. \* represents correlation is

significant at the 0.05 level. The variable ‘Mean of written-in personal strategies’ represents the mean strategy use of the strategies all participants described at T2.

**Strategy Use and Spending (Daily Sample Reports).** In exploratory (not preregistered) analyses, I examined whether self-reported strategy use in the proactive and reactive conditions was linked to daily spending. For this analysis I focused on the two strategy conditions only ( $N = 2324$ ), as participants in the control condition did not report on strategy use in the daily reports. The variance in the number of strategies used was 42.4% within-person and 57.6% was between-person. Per diary report, participants used a similar number of strategies in the proactive strategies condition ( $M = 1.96$ ,  $SE = 0.06$ ), and the reactive strategies condition ( $M = 2.02$ ,  $SE = 0.06$ ),  $B = -0.06$ , 95%  $CI [-0.22; 0.11]$ ,  $F(1, 281.25) = 0.43$ ,  $p = .511$ ,  $partial \eta^2 = .002$ . I examined whether the number of strategies used were linked with the amount of money spent during the day (controlling the number of spending situations encountered because it would be predictive of both). The number of strategies used was not significantly related to spending that

day, while controlling for the number of spending situations encountered, neither in the proactive condition,  $F(1, 436.55) = 0.18, p = .673, \text{partial } \eta^2 < .001$ , or in the reactive condition,  $F(1, 284.44) = 0.53, p = .469, \text{partial } \eta^2 = .002$ .

### ***Exploratory: Spending Effects on Feeling Happy***

As in Study 3, I examined whether the condition, spending more money overall, or using more strategies was linked to participants reports of happiness at the end of the day (not preregistered). I also examined whether participants were happier on days they spent money on other people (19.6% of daily reports included a purchase made for others). I conducted 2-level multilevel analyses controlling within-person variance using the MIXED command in SPSS. In an analysis including condition, total spending, and spending money on others (0 = *No*, 1 = *Yes*) as predictors and happiness as dependent variable, I found no significant effect of condition on happiness,  $B = -0.02, 95\% \text{ CI } [-0.15; 0.12], t(488.80) = -0.28, p = .778$ , no significant effect of total spending on happiness,  $B = 0.001, 95\% \text{ CI } [-0.0009; 0.003], t(3030.30) = 1.08, p = .280$ , but a positive significant effect of spending money on others on happiness,  $B = 0.11, 95\% \text{ CI } [0.02; 0.20], t(3131.29) = 2.42, p = .016$ . People were happier on days they spent money on others ( $M = 4.89, SE = 0.06$ ) than on days they did not ( $M = 4.68, SE = 0.03$ ). In an analysis including condition and the number of strategies used that day as predictors, and happiness as dependent variable, I found no significant effect of condition on happiness,  $B = -0.27, 95\% \text{ CI } [-0.55; 0.15], t(284.80) = -1.87, p = .063$ , and no significant effect of using more strategies on happiness,  $B = 0.04, 95\% \text{ CI } [-0.05; 0.12], t(1432.69) = 0.88, p = .381$ .

### ***Exploratory: Typicality of the Month***

I also examined participants' reports of how typical the month was in terms of their experiences and spending in general (not preregistered). An overall test showed there were a

significant difference between the conditions for how typical the month was in terms of participants' experiences in general  $F(2, 359) = 3.45, p = .033, partial \eta^2 = .019$ , and participants' spending in general  $(F(2, 359) = 7.15, p = .001, partial \eta^2 = .039)$ . Participants in the proactive condition (experiences:  $t(359) = 2.01, p = .046, d = 0.26$ ; spending:  $t(359) = 3.21, p = .001, d = 0.41$ ) and the reactive condition (experiences:  $t(359) = 2.46, p = .015, d = 0.32$ ; spending:  $t(359) = 3.31, p = .001, d = 0.42$ ) reported their month was significantly more typical than participants in the control condition. There was no significant difference between the proactive and reactive condition for how typical the months was in terms of experiences,  $t(359) = 0.44, p = .660, d = 0.06$ , or spending,  $t(359) = 0.08, p = .937, d = 0.01$ . Including the typicality of the month in terms of experiences and spending as covariates in the main test of the condition effect on monthly spending did not change the findings of the condition effect,  $F(3, 354) = 7.24, p = .001, partial \eta^2 = .039$ .

### ***Exploratory: Correlations***

See Table 12 for a correlation matrix of monthly actual spending and individual strategy use at T2, with T1 demographics, trait self-control, and with T2 emotions (positive affect and negative affect), regulatory focus (promotion focus and prevention focus)<sup>10</sup>, goal motivation (autonomous motivation and controlled motivation), and individual strategy use. I do not discuss these correlations in detail because these exploratory (not preregistered) correlations are only a selection of all the possible relationships I could examine, considering the numerous measurements and time points in this study. As in Study 3, some of participants' demographic

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<sup>10</sup> Regulatory focus is when a person is motivated either by a desired or non-desired end state (Crowe, & Higgins, 1997). People who have a promotion focus are motivated by advancement, growth, and accomplishment (e.g., they play to win) and are sensitive to positive outcomes. People who have a prevention focus are motivated by safety, responsibility, and security (e.g., they play not to lose) and are sensitive to negative outcomes.

indicators (age, education, and income) were significantly correlated to spending over the month, with older, more educated, and higher income participants spending more money. Trait self-control was not significantly correlated with monthly spending. Correlations between strategy use and regulatory focus showed people who with a greater promotion focus (i.e., focus on opportunities for goal advancement) used the strategies *avoid places*, *limit access*, *plan purchases*, *reason for goal*, and *future self* significantly more often. The only strategy correlated with prevention focus (i.e., focus on preventing goal obstacles) was the *limit access* strategy.

I also examined the effect of goal motivation on strategy use. Participants who had greater autonomous motivation to pursue their spending goal (i.e., because they think it is important, they enjoy pursuing it, and it represents who they are) reported more frequent strategy use for each of the six strategies that were listed. Participants who had greater controlled motivation (i.e., because someone else wants them to or they would feel guilty if they did not pursue the goal) reported more frequent strategy use of for five of the six strategies that were listed. Only the strategy *plan purchases* was not significantly correlated to control motivation. This suggests that strategy use may differ based on the type of motivation a person has when pursuing a spending goal.

**Table 12**

*Exploratory Correlation Matrix for Study 4*

	<i>Exit survey (T2)</i>									
	March actual spending	Mean of written-in strategies	Avoid places	Limit access	Plan purchases	Anticipate regret	Reason for goal	Future self	Positive affect	Negative affect
<i>Intake survey (T1)</i>										
Age	.15**	.13*	-.004	-.16**	.05	-.06	-.08	-.06	.07	-.14**
Education	.23**	-.01	.02	-.03	.01	.02	.01	-.004	.15**	-.10
Income	.55**	-.01	.02	.11*	.05	.08	.11*	.04	.17**	-.16**
Financial stress	-.15**	.004	.12*	.11*	.06	.06	.09	.09	-.31**	.42**
Trait self-control	.01	.07	.04	.02	.24**	.08	.11*	.14**	.35**	-.39**
<i>Exit survey (T2)</i>										
Written-in strategies	.09	1								
Avoid places	.002	.22*	1							
Limit access	-.01	.05	.35**	1						
Plan purchases	.03	.35**	.31**	.20**	1					
Anticipate regret	.03	.30**	.34**	.10	.37**	1				
Reason for goal	.10	.31**	.32**	.21**	.40**	.50**	1			
Future self	.01	.37**	.34**	.15**	.38**	.52**	.58**	1		
Positive affect	.06	.07	.07	.08	.09	.01	.04	.14**	1	
Negative affect	-.11*	-.03	.08	.08	-.05	.08	.08	.07	-.43**	1
Promotion focus	-.04	-.002	.15**	.17**	.14**	.07	.16**	.21**	.15**	.15**
Prevention focus	-.12*	.02	.06	.12*	-.03	-.06	-.02	.04	-.11*	.32**
Autonomous motivation	-.04	-.04	.27**	.18**	.43**	.25**	.37**	.40**	.31**	-.06
Controlled motivation	-.09	-.09	.20**	.30**	.07	.15**	.14**	.16**	-.04	.26**

*Note.* \* represents significant at the 0.05 level (2-tailed). \*\* represents significant at the 0.01 level (2-tailed). Proactive strategies:

avoid places limit access, and plan purchases. Reactive strategies: anticipate regret, reason for goal, future self. The variable ‘Written-in strategies’ represents the mean strategy use of the strategies participants described at T2.

## Discussion

This study examined how highlighting proactive or reactive strategies influenced participants' spending over the course of a month. Unlike Study 3 where participants were provided with strategies to use during the month, this study asked participants to describe their own strategies, after viewing a video explaining the idea of proactive and reactive financial self-control strategies, respectively. This procedure was designed to be more engaging, interactive, and potentially, to allow for better fit between the self-control strategies and a person's personality and lifestyle. I found a significant difference between the conditions for spending during the month controlling for their spending goal. People assigned to the proactive condition spent significantly less than people assigned to the reactive condition. People who described and used proactive strategies spent on average \$322 less than they intended during the month, while people who described and used reactive strategies spent on average \$246 more than they intended during the month. In other words, people who used proactive strategies spent on average 13% less than they intended and people who used reactive strategies spent 9% more than they intended during the month. Therefore, consistent with self-control models (Duckworth et al., 2014; Hofmann & Kotabe, 2012), this study found that proactive strategies were superior to reactive strategies. However, the effect of condition on spending was only evident in the monthly analysis. Daily spending did not significantly differ by condition. Taken together, these results may suggest that the effectiveness of strategies on spending may manifest over time and that small differences in individual spending situations can accumulate to create more meaningful differences over a month.

The main analysis compared actual spending relative to the spending goal to assess strategy effectiveness. All spending amounts were self-reported by the participants, and this may

have introduced bias in the reported actual spending. For example, some participants may have thought about their spending goal throughout the month, and in the final survey they may have reported spending close to their spending goal due to social desirability bias (Nederhof, 1985). Also, some participants who reported using self-control strategies often may have assumed that if they used self-control strategies often then they must have spent less. Additional research is needed to replicate the current findings with more objective measures of spending, such as receipts or bank statements.

Study 4 also showed that participants could in general correctly identify proactive and reactive strategies and describe the strategies relevant to the condition. Considering people do spontaneously use strategies (Hennecke et al., 2019; Milyavskaya et al., 2020; Peetz & Davydenko, 2021; Williamson & Wilkowski, 2020), such a design may allow for better fit with people's personality and lifestyle. Factors such as the type of goal motivation (controlled vs. autonomous motivation, Deci & Ryan, 1980) and regulatory focus (promotion vs. prevention focus, Higgins et al., 2001) can influence how people experience temptations and may also influence strategy use and effectiveness. In the present study, people with a greater promotion focus used both a greater variety of strategies and used strategies more often during the month. Consistent with previous research (Koestner et al., 2008), I found there was a significant correlation of autonomous motivation with the *plan purchases* strategy, suggesting the greater a person's autonomous motivation, the more often they plan their spending behaviour. There was no correlation between controlled motivation and the *plan purchases* strategy. The exploratory findings from this study provide some evidence that individual differences may be influential factors in strategy use.

### **Comparing Two Attempts at Manipulating Strategy Use**

Study 3 and 4 had a similar study design, both studies assessed spending on individual days and over the month, and both studies attempted to manipulate strategy use to assess how using proactive or reactive strategies influenced spending relative to goals. Table 13 presents a comparison of key method features and key findings between the two studies. Some of the results were consistent across studies: for example, there was no effect of condition on daily spending, using the *limit access* strategy more often correlated with spending less over the month, and people were happier on days they made purchases for others. However, there were critical differences in manipulation design and success, as well as differences in data quality between the two studies.

**Table 13**

*Comparing Study 3 and Study 4 on Selected Method Features, Sample Features, and Findings*

	Study 3	Study 4
<i>Method Features</i>		
Measurement time points	T1 (intake), 10 diary reports, T2 (exit), T3	T1 (intake), 10 diary reports, T2 (exit)
Conditions	control, willpower, proactive, reactive	control, proactive, reactive
Manipulation procedure	participants read about three strategies	participants watched a video about strategies + described three strategies they already use
<i>Sample Features</i>		
MTurk approval rate (eligibility)	95%	97%
Number of participants recruited (T1)	$n = 525$	$n = 603$
Number of participants excluded (T1)	$n = 87, 16.6\%$	$n = 42, 6.9\%$
Number of participants (T2)	$n = 303$	$n = 362$
<i>Results - Monthly</i>		
Strategy use by condition	no significant difference	significant difference for <i>avoid places, limit access, anticipate regret</i> strategies ( $ds > 0.26$ )
Spending goal across conditions	$M = \$2,315.21, SE = 108.75$	$M = \$2,341.01, SE = 81.78$
Actual spending across conditions	$M = \$2,406.23, SE = 119.13$	$M = \$2,308.51, SE = 93.47$
Actual spending by condition, controlling spending goal	no significant condition difference	significant condition difference, $d = 0.38$
Control vs. proactive condition	not a significant contrast	not a significant contrast
Control vs. reactive condition	not a significant contrast	significant contrast
Proactive vs. reactive condition	not a significant contrast	significant contrast
$r$ strategy use / spending across conditions	only <i>limit access</i> strategy significantly correlated with spending, $r = -.13$	only <i>limit access</i> strategy significantly correlated with spending, $r = -.11$
Typicality of monthly experiences across conditions	$M = 4.79, SE = 0.08$	$M = 5.35, SE = 0.07$
Typicality of monthly spending across conditions	$M = 4.90, SE = 0.09$	$M = 5.16, SE = 0.08$
<i>Results - Diary Reports</i>		
Number of daily spending situations across conditions	$M = 1.42, SE = 0.05$	$M = 1.24, SE = 0.04$
Number of strategies used daily across conditions	$M = 1.16, SE = 0.03$	$M = 2.04, SE = 0.02$
Condition effect on actual spending	no significant difference	no significant difference
Effect of strategy use on spending	no significant effect in either condition	no significant effect in either condition
Effect of purchases for others on happiness	significant effect	significant effect

The two studies differed in how engaging the manipulation was for participants, and arguably because of this difference in procedure, the two studies differed in the effectiveness of the manipulation. In Study 3, participants were given information on either proactive or reactive strategies. The strategy information was presented in several sentences and was represented with small images. Participants were only asked to read the strategy information; they were not asked to further engage with the information by thinking about how strategies impact their personal goals or to describe the strategies they use. I did not measure whether participants read the strategy information (or skipped to the next page), how long it took them to read it, or whether they understood the information. Therefore, it is unclear whether simply reading information about strategies is or is not effective because I do not know whether participants actually read the strategy information. Overall, this manipulation was not successful at creating differences between proactive and reactive strategy use by condition.

Study 4 attempted to correct some of the limitations in Study 3. First, in an attempt to make the strategy manipulation more engaging, I added a video featuring three proactive or three reactive strategies, and I gave detailed examples of how participants could use these strategies in their daily life. I made sure to keep the video short (90 seconds) to not burden participants' attention, while keeping the video informative and visually interesting. Second, in an attempt to make sure the strategy manipulation was received, I timed the survey page with the video and the button for the next page did not appear until after the video ended. Of course, some participants may have chosen to look away while the video was playing. Third, in an attempt to facilitate fit, instead of randomly assigning participants to read about strategies, I randomly assigned participants to describe the strategies they already use. Thus, rather than encouraging participants to start using potentially new strategies (as in Study 3), participants were reminded of and

encouraged to use already familiar strategies. Study 4 showed some evidence that strategy use differed by condition.

Another discrepancy concerns the data quality between the studies. I compared Study 3 and 4 in the number of exclusions (i.e., spending goal outliers, spending goal that is double the monthly income, and nonsense written responses) I made while cleaning the intake survey data: much fewer exclusions were necessary in Study 4 than in Study 3, even while using the same exclusion criteria. Also pointing to potential issues with data quality, there was greater variability in intended and actual monthly spending in Study 3 than in Study 4, as evidenced by the larger standard errors, even though the mean intended and actual monthly spending was comparable across the studies (see Table 6 and 10). The increased error variance may have also contributed to the failed manipulation in Study 3. A possible explanation for the difference in data quality may be the difference in the minimum approval rate used for recruiting participants in the MTurk recruitment tool (Study 3: 95% approval of past hits; Study 4: 97% approval of past hits).

In sum, even though the two studies were similar in many ways, there were small but meaningful differences in study design and data quality between Study 3 and Study 4. The findings from Study 3 should be interpreted cautiously because of issues with data quality and uncertainty in the delivery of the manipulation. Study 4 had better data quality and a more engaging manipulation. I posit that the findings from Study 4 are the more trustworthy test of strategy use and effectiveness over a month.

### **General Discussion**

Spending temptations are common in daily life and falling short of financial goals can have severe consequences. Financial well-being is linked to subjective well-being (Netemeyer et al., 2018) and life satisfaction (Miron-Shatz, 2009), whereas financial stress has been linked to

physical health struggles (Kahn & Pearlin, 2006), problems in close relationships (Hubler et al., 2016), and reduced mental health (Davis & Mantler, 2004). Self-control strategies can aid financial decision-making. The first part of this dissertation is the first attempt at collating the diverse self-control strategies that have been studied in the financial domain, promoted in online media, and used by lay people in their daily life. Overall, I identified 28 distinct self-control strategy categories. A formal meta-analysis of the studies to date suggests that financial self-control strategies are effective in improving financial decisions, regardless of whether they are proactive or reactive to the spending situation (meta-analysis). I also examined two non-academic perspectives: strategies recommended in media communications (Study 1) and those reported by lay people (Study 2). There was a considerable degree of overlap across the three perspectives, but half of the financial self-control strategies that are recommended in media and that are reportedly used by lay people have yet to be studied empirically (i.e., they did not come up in the meta-analysis literature search). Most of the identified financial self-control strategies were proactive strategies rather than reactive strategies and were used to reduce spending rather than increase saving. Self-control models suggest that proactive strategies are more effective for self-control than reactive strategies (Duckworth et al., 2014; Hofmann & Kotabe, 2012).

In the second part of this dissertation, I examined the effectiveness of self-control strategies. Two longitudinal studies suggest that people do spontaneously use financial self-control strategies to control their spending in daily life. Informing participants about proactive or reactive financial self-control strategies did not significantly affect their spending over the course of a month or in daily spending situations (Study 3). However, asking participants to report on their proactive or reactive strategies did significantly affect their spending over the course of a month, but not their daily spending situations (Study 4). I speculate that the spontaneously used

strategies likely facilitated the best fit with participants' personality and lifestyle. The meta-analysis found proactive ( $d = 0.56$ ) and reactive ( $d = 0.58$ ) strategies had a moderate effect on financial goals (Cohen, 1992). In Study 4, I found small effect sizes when comparing the proactive and control condition ( $d = 0.23$ ) and the reactive and control condition ( $d = 0.20$ ) for the difference score between actual spending and spending goal. Study 4 may have found a smaller effect because it was conducted outside the lab, while most (62.1%) of the studies in the meta-analysis were conducted in the lab. Field studies often differ from lab studies in the strength of the effect size (Mitchell, 2012; Vanhove & Harms, 2015).

### **Theoretical Implications**

#### ***Proactive vs. Reactive Self-Control Strategies***

Across the research (meta-analysis), media (Study 1), and lay (Study 2) perspectives on financial self-control strategies, proactive strategies were generally more common than reactive strategies. Among the self-control models (Duckworth et al., 2014, 2016; Hofmann & Kotabe, 2012), proactive strategies are thought to be superior to reactive strategies because they remove or restrict tempting situations and thereby promote goal-consistent decision-making. Among the empirical work, it is unclear whether proactive strategies are superior. On the one hand, Duckworth and colleagues (2016) showed in experimental studies with students that situation modification strategies (e.g., putting a smartphone out of sight when studying) are more effective than using willpower or using no strategies for goal achievement. However, the researchers examined strategy effectiveness broadly through self-reported goal progress (i.e., how well the students felt they accomplished their goal, 1 = *extremely poorly* to 5 = *extremely well*), rather than assessing goal progress via concrete units relative to goals stated earlier (e.g., intended time and actual time spent studying). Also, this research by Duckworth and colleagues (2016)

compares proactive strategies to willpower, rather than comparing proactive strategies with reactive strategies. On the other hand, correlational studies suggest using any type of strategy is effective compared to using no strategies and using multiple strategies per situation may be more effective than using any single strategy (Milyavskaya et al., 2020; Williamson & Wilkowski, 2020).

In line with Duckworth and colleagues (2016), I also experimentally tested the effectiveness of proactive strategies on goal pursuit. Rather than assessing perceived progress, I assessed self-reported monthly spending and I compared proactive strategy use to reactive strategy use. I suspect the manipulation was not strong enough in Study 3 to change the types of strategies people were already using, so in Study 4, I asked people to use either more proactive or more reactive strategies that they were already using. In Study 4, I found both a statistically significant and meaningful effect of using proactive strategies on monthly spending compared to using reactive strategies. People who used proactive strategies spent \$322 less than they intended during the month. Surprisingly, people who used reactive strategies spent significantly more than they intended during the month. It may be that reactive strategies truly are inferior because once people are faced with a temptation using a reactive strategy becomes more difficult. It may also be that some people use reactive strategies ineffectively and rationalize the temptation while thinking about the strategy (e.g., instead of thinking about if they need or want the item, they think about whether they deserve the item and rationalize the purchase). More research is needed to examine what can cause reactive strategy use to backfire. In line with the Process and PI models, Study 4 suggests that proactive strategies can be effective for spending temptations and goals. The findings from correlational studies (Hennecke et al., 2019; Milyavskaya et al., 2020; Williamson & Wilkowski, 2020) suggest that overall self-control strategies can be effective for

goal pursuit, and experimental work (Duckworth et al., 2016; present Study 4) is starting to suggest that proactive strategies may be especially effective.

There is no one-size-fits-all strategy. Daily life involves many diverse spending situations, and some strategies may not suit some situations (e.g., cannot use cash in online transactions). Over time, people may have tried various self-control strategies and settled on those that were effective for them and their personal situation. In Study 3 and 4 I found spending on others was related to feeling happier that day. For example, certain strategies may be more, less, or not at all effective for spending situations where purchases are made for other people. Past research suggests people are happier when they spend money on others (Dunn et al., 2011, 2014; Geenen et al., 2014). It may be that giving into the occasional temptation to buy something for someone else or to donate to a charity is actually beneficial for the person's well-being and those benefits outweigh the consequences of the occasional self-control failure.

Even though some specific financial strategies showed stronger effect sizes in the meta-analysis or were more frequently mentioned in the media (Study 1) or by lay people (Study 2), I do not have enough evidence to suggest which individual strategies are superior. It may be better to inform individuals of a variety of possible strategies to choose from as the situation allows, or to remind them of the strategies they already use. The present research also highlights potentially new self-control strategies (e.g., relying on a partner for self-control support) for research. About half of the strategies lay people report using for their financial goals were not found through the literature search in the meta-analysis. I do not claim that the literature search found all relevant research or that a similar strategy has not been studied in a different domain, but it is likely there is potential for more empirical research among the 28 strategies I identified. Furthermore, in line with other studies (Hennecke et al., 2019; Milyavskaya et al., 2020; Peetz & Davydenko, 2021),

I found people spontaneously use multiple self-control strategies in their daily life (Study 3 and 4).

### *Self-Control Strategies and Domain Specificity*

This dissertation summarizes research, media communication, and personal experiences about an understudied domain of self-control: financial goals. The majority of psychological research on self-control strategies has focused on academic goals (e.g., Ariely & Wertenbroch, 2002; Benedict & Hoag, 2004; Duckworth et al., 2019; Robinson et al., 2018; Schmitz & Perels, 2011) and on health goals (e.g., Burke et al., 2011; David & Haws, 2016; Krishnamurthy & Prokopec, 2010; Milkman et al., 2014; Pearson, 2012). In contrast, in the present research I focused on self-control strategies specific to the financial goal domain. These financial self-control strategies nonetheless link to broader conceptual types of self-control strategies, such as avoiding temptations more generally (Wertenbroch et al., 2001; Ent et al., 2015; Rovenpor et al., 2013), changing how one thinks about a temptation (Keinan & Kivetz, 2008; Finkel et al., 2013; Fujita & Han, 2009), and pre-committing before encountering a temptation (Beshears et al., 2011; Ladouceur et al., 2012; Marti & Sindelar, 2015). The broad findings of the present research likely generalize to self-control strategies in other domains, but there may be variability in strategy effectiveness across domains. Gollwitzer and Sheeran's (2006) meta-analysis of implementation intentions research found that implementation intentions are generally effective for goal pursuit ( $d = 0.65$ ), but the effect size varied across goal domains. Implementation intentions had a medium effect ( $k = 2, d = 0.41$ ) on consumer goals, while they had a larger effect on academic goals ( $k = 9, d = 0.72$ ) and health goals ( $k = 23, d = 0.59$ ). Only two of the 94 studies in Gollwitzer and Sheeran's (2006) meta-analysis examined the use of implementation

intentions for consumer goals, namely collecting a coupon (Aarts et al., 1999) and purchasing a product (Dholakia & Bagozzi, 2002).

Self-control strategies might be more effective if they are described in actionable ways that are specific to the goal domain. For example, the general strategy ‘avoid temptations’ may be more effective for promoting healthy eating when phrased as ‘avoid the dessert menu at restaurants’ and more effective for promoting limited spending when phrased as ‘avoid tempting stores in the mall’. Past research shows spending self-control and eating self-control are related ( $r > .48$ ), suggesting there is an overlap between health and financial domain-specific self-control, but there are also noteworthy differences where a person may have greater self-control in one domain than another (Haws et al., 2016). Building on the present research of self-control in the financial domain, future research in collaboration with economists could integrate economic self-control models (e.g., Dual Self Model of Impulse Control, Fudenberg & Levine, 2006; hyperbolic discounting models, Hoch & Loewenstein, 1991; Laibson, 1995; Salanié & Treich, 2006) and psychological self-control models (Duckworth et al., 2014; Hofmann & Kotabe, 2012) to create an interdisciplinary understanding of self-control for financial goals.

### ***Willpower and Self-Control***

One way to resist temptations is to exert willpower, suppressing the tempting impulse through effortful inhibition. In practice, controlling impulses using solely willpower is difficult (Hagger et al., 2010; Inzlicht et al., 2014; Kool et al., 2013; Mischel & Ayduk, 2011; Westbrook & Braver, 2015) and relying on willpower alone may result in self-control failures and falling short on goals. In fact, researchers determined that successful self-control is not solely based on exerting willpower (Inzlicht & Friese, 2020; Milyavskaya & Inzlicht, 2017; Williamson &

Wilkowski, 2020). Instead, self-control strategies can be another way to resist temptations and to act in line with goals without relying on willpower.

In Study 3, I found people who were instructed to use willpower used self-control strategies just as often as people who were told to use strategies, and people who were instructed to use self-control strategies reported using willpower as often as people who were told to use willpower. This may be because lay people think willpower and self-control are synonyms: they do not differentiate, as researchers do, between resisting temptation through effortful inhibition (e.g., just say ‘no’ to the temptation) and resisting temptation through self-control strategies (e.g., think about if you would later regret giving into the temptation). Even in the dictionary, willpower is defined as self-control (*Definition of Willpower | Dictionary.Com*, n.d.). Therefore, it is not surprising that in Study 3 people reported using self-control strategies when they are told to use willpower – in their understanding, they may have been using ‘willpower’ when they avoided tempting places or when they thought about if they need or want the item, for example.

Also, some lay people may not realize the breadth of diverse self-control strategies and may not realize they are using strategies. In the lay sample (Study 2), some participants reported that they do not use self-control strategies, but then continued to describe a self-control strategy. For example, one participant wrote, “I do not use strategies or other nonsense. I figure out my absolutely necessary expenses - housing, heat, etc. - and spend no more than that.” However, thinking about whether a purchase is a need/necessity or want/desire could be a reactive strategy to cognitively reappraise a temptation to boost control motivation in favour of self-control (and so is planning or budgeting necessary expenses in advance).

My findings are in line with recent research which found participants who are instructed to use only willpower still use a variety of self-control strategies (Werner et al., 2021),

suggesting researchers and lay people may have different understandings of ‘willpower’. These misunderstandings between researchers and participants highlight the need for intentional and meticulous study design to ensure the correct construct (i.e., willpower, self-control, or self-control strategies) is being measured. There is also a need for greater knowledge translation from researchers to the public about what willpower is, what it is not, and its limitations.

### **Consequences of Falling Short on Financial Goals**

People tend to overestimate their ability to resist temptation and these inflated self-control beliefs may lead people to overexpose themselves to tempting situations (Nordgren et al., 2009). Failures in self-control can impact one’s interpersonal relationships (Koval, Vandellen, Fitzsimons, & Ranby, 2014), physical health (Vohs & Heatherton, 2000), and financial success (Griesdorn & Durband, 2016; Roberts & Manolis, 2012; Vohs & Faber, 2003). In the financial domain, consumers’ ability to regulate spending-related thoughts and decisions relate to not only financial (e.g., credit card debt) consequences, but also psychological (e.g., shame, guilt) and social (e.g., disagreements about household financial matters) consequences (Bearden & Haws, 2012). People who are most vulnerable to giving in to temptations may be most in need of self-control strategies. Previous research suggests people low in trait self-control may especially benefit from using self-control strategies to resist temptations (Haws et al., 2012, 2016; Hofmann et al., 2012). For example, people low in trait self-control are willing to pay more when paying with a credit card, especially when there’s a high credit limit on the card (Bearden & Haws, 2012). Low trait self-control is also associated with poor credit card debt management and making more materialistic purchases (Limerick & Peltier, 2014).

Although spending temptations may be less frequent than other temptations (e.g., to eat, sleep, or drink) on any given day (Hofmann et al., 2012), insidious spending temptations can

lead to impulsive purchases and spending more than one anticipated or can afford. For example, 47% of Canadians said they do not expect to be able to cover basic living expenses over the next year without going into debt (MNP LTD, 2019). On average, Canadians are \$557 away from insolvency after paying their monthly bills and 48% of Canadians reported having less than \$200 left over after paying monthly expenses (MNP LTD, 2019). In America, 74% of adults have credit card debt (Wamala, 2019) and 44.4% of bankruptcies were related to spending or living beyond one's means (Konish, 2019). Therefore, frequent self-control failures in the financial domain can have disastrous consequences not only on people's well-being but also on their financial security.

### **Practical Considerations**

The present research has important implications for how future studies examine financial self-control strategies. The present meta-analysis is a first attempt at understanding the overall effectiveness of financial self-control strategies. The majority of the included studies were lab studies (62%) and were published in peer-reviewed journals (76%). It may be that strategy effectiveness differs based on whether the study was conducted in the field or in the lab (see Levitt & List, 2007a, 2007b for the generalizability of lab studies). Both lab and field studies are valuable to empirically testing strategy effectiveness, but the strategies found to be effective in the lab may not translate to being effective in the field. For example, past research from lab studies found being reminded of a saving goal led to greater saving intentions (Soman & Zhao, 2011). In a field study, researchers sent text message reminders with varying types of messages to over 18 million participants across six countries (*Nudge Today, Almost Gone Tomorrow*, 2021). The researchers found saving reminders had a significant, but very small (0.3% increase), effect on whether a person makes a saving deposit and the saving behaviour stopped as soon as

the reminders stopped. The findings from lab and field studies on strategy effectiveness are likely to be correlated, but the size of the effect may be accentuated in lab studies (also see Benz & Meier, 2008 for a comparison of lab and field studies on pro-social spending). Not all strategies that are found to be effective in the lab will prove to be equally effective in the field.

Lab studies are also not well equipped to examine how a strategy fits with a person's lifestyle and whether they would actually use the strategy outside of the study. The studies included in the meta-analysis tested individual rather than sets of strategies and did not allow for spontaneous strategy use - the strategies a participant used was determined by random assignment. However, there may be certain strategies that are only effective for certain people or in certain situations. Past research suggests people's experience of temptations can differ based on their regulatory focus (Freitas et al., 2002; Higgins et al., 2001), goal motivation (Deci & Ryan, 1980; Milyavskaya et al., 2015), and personality (Claes & Müller, 2017; Otero-López & Villardefrancos, 2013). In exploratory analyses in Study 3, I found the personality trait openness was negatively correlated with the *avoid places* strategy and the *limit access* strategy, suggesting people who are open to new experiences use strategies that limit future options less often. In exploratory analyses in Study 4, I found people with a greater promotion focus used strategies more often and used a greater number of strategies. I speculate that individual differences may influence not only how often but also which strategies a person uses. For example, a person with promotion focus may consider their long-term saving goal when in a tempting spending situation, while a person with prevention focus may consider their future regret over unnecessary purchases. Although random assignment assumes variations in individual differences are spread across conditions, researchers (including myself) could be missing valuable insights by overlooking individual differences when assessing self-control strategies.

The present research also has important implications for knowledge mobilization and implementation science. Finding the best ways to put research evidence into practice and educating people and organizations ‘on the ground’ about research findings is an important aspect of empirical research. Disseminating empirical knowledge to lay audiences has been an increasingly explicit goal of governments and research funding agencies (e.g. Center for Implementation; Research Impact, 2014; SSHRC, 2019). More research is needed to examine how information about financial self-control strategies (and other empirical findings on behaviour modification) may be best delivered to lay individuals for the greatest effectiveness. One starting point may be to tie in education on strategies with existing practices. Simply informing participants of empirically tested strategies did not lead to a measurable change in behaviour (Study 3) but encouraging people to use the proactive strategies they already use was more effective for reducing spending (Study 4). Approximately half of the strategies mentioned in the online media and used by people were not found in the academic literature, suggesting more *dialogue* is needed between researchers and lay audiences. As much as researchers have a mandate to teach the public about their findings, they also have a responsibility to learn from the public. To maximize knowledge mobilization efforts, researchers need to develop a better understanding of how participants understand self-control, willpower, self-discipline, and temptations to ensure the research is being received as intended and as effectively as possible.

### **Limitations**

I recruited participants through MTurk. Thus my findings are based on a specific subset of the population (younger, more educated, and more white; Stone et al., 2019) and may not generalize to other populations. Similarly, the media sample (Study 1) collected strategies from the North American media and the lay samples in Study 2, 3, and 4 recruited North American lay

people. These studies represent the perspectives of WEIRD (Henrich et al., 2010) culture and might not generalize to other populations or global media. Cultural or country differences may also impact the generalization of these strategies based on people's varying approaches to money (e.g., differences in risk perception, Weber & Hsee, 1998) and on the financial institutions in their country (e.g., differences in online banking, Yuen et al., 2010). For example, online banking can be a helpful tool for some self-control strategies, such as for tracking accounts, creating goals, automatizing saving deductions, or budgeting. However, adoption of online banking may differ across countries: for example, respondents from the USA and Australia report greater intentions to use online banking and feel more confident using it than respondents from Malaysia (Yuen et al., 2010). It is likely that the types of strategies used and the effectiveness of certain strategies differs by person, situation, and group. The present research presents only a snapshot of self-control strategies.

Using an individual self-control strategy once is unlikely to result in long-lasting effects to one's financial status (see Loewenstein & Chater, 2017 for a discussion of the role of nudges in long-term change). However, consistently using self-control strategies may help people spend a little less than they otherwise would during each spending situation and such small changes may add up to larger effects over time. Therefore, to assess the effectiveness of self-control strategies in reducing spending it is important to consider spending behaviour over time. The present research focused on monthly time frames for spending goals and spending reports. Many financial goals are long-term goals (e.g., saving for retirement, vacation, children's college) and the findings might not generalize to behaviour across longer time frames. Spending patterns also likely change across the calendar year, and thus spending during the month of August and March might not directly generalize to spending at other times of the year. I took care not to collect data

during the last or first month of the year because these months might feature an unusual number of temptations (December) or unusually ambitious goals (January).

Study 3 and Study 4 were conducted during the COVID-19 pandemic, which drastically changed the daily lives of people around the world. I avoided conducting the studies in early 2020 because of the extensive pandemic restraints in Canada and America that influenced how people spend money, such as closures of dine-in restaurants and non-essential businesses. I conducted Study 3 approximately seven months into the pandemic (when Canada and America were past the first wave) and Study 4 approximately one year into the pandemic (when Canada and America were between the second and third wave). I assessed how typical people's spending and experiences were during the month of the study, and the condition effects on spending did not change when controlling for the typicality of the month (Study 3 and 4). Compared to the scale midpoint, people reported that their spending during the month of the study was typical of their spending in general (Study 3 and 4) and pre-pandemic (Study 3). Although their spending may have been typical, what people purchased may have changed. For example, people who frequently went to restaurants and movies may have spent less on such expenses, but increased their spending elsewhere, such as for take-out and streaming services.

I also caution that the present research does not represent an exhaustive list of all possible financial self-control strategies, or even all empirically tested financial self-control strategies. Even though I included broad search terms in the meta-analysis, the literature search may have missed relevant studies. Future studies might address this limitation by including strategy specific search terms in a systematic literature review (e.g., shopping list, budget, pre-commitment) or to search within the general self-control literature rather than the financial domain. Additionally, media advice encompasses a variety of communications, from print media

(magazines, newspapers, books) to social media (Twitter, Facebook). The media sample focused on online Google search results, including blogs, online magazines/newspapers, and websites for financial organizations. Arguably, online searches are an important and commonly used way to learn about an issue – Google processes 3.5 billion searches per day (*Google Search Statistics - Internet Live Stats*, n.d.). It is important to keep in mind that the media sample is just that: a sample of the available communications about financial strategies. Future studies might examine media communications about financial self-control strategies – or about general self-control – in more depth, comparing the recommendations across different media sources.

### **Future Directions**

Future research can examine which strategies are best in which situations, or even examine the optimal number of strategies to employ when making financial decisions. Indeed, simply providing people with a list of all possible self-control strategies may be mentally taxing to the person reading this list. Each strategy also does not involve only one simple step towards implementation but likely several (at least outside the lab). For example, one effective financial self-control strategy would be to pay for one's purchases with cash (Prelec & Simester, 2001); however, in practice, this strategy would require a considerable amount of foresight and planning (i.e., additional self-control tasks) to ensure one always has cash on hand. Using this strategy in conjunction with other self-control strategies before every purchase, such as checking your account balance (Cheema & Soman, 2006) and reflecting on future regret (Keinan & Kivetz, 2008), may be too effortful considering the numerous spending situations individuals encounter on a daily basis. Thus, selective use of strategies based on an individual's personal situation and the specific spending situation may better serve the purpose of self-control strategies: to ease self-control and increase goal-consistent decision-making. There is likely no single, perfect

strategy to reduce spending or increase saving. Future research can also consider how individual differences may influence strategy selection and effectiveness. A mega study approach may be useful for future research to study the effectiveness of a large variety of individual strategies across numerous situations and samples (for review of the mega study approach for behaviour change interventions see Milkman, 2020 for increasing exercise and Milkman et al., 2021 for increasing vaccine uptake).

Future research should also examine the specifics of knowledge translation of self-control strategies for financial goals. For example, in Study 3, participants read about three strategies they could use for spending goals; they reported using on average 1.16 strategies per day. In Study 4, participants watched a video about strategies and were encouraged to continue using the three strategies they described; they reported using on average 2.04 strategies per day. Study 4's more engaging and participant-focused design led to greater strategy use. Future research could inform the best ways to disseminate academic research to the general public. Also, future research could examine the role psychologists have in financial decision-making. Lay people may think that their financial goals are less influenced by psychology than other goals (e.g., health and academic goals) and may not consider more cognitive based strategies (e.g., think about your future self, anticipate regret) as relevant for financial goals as more behaviour-based strategies (e.g., leave your wallet at home, automatize saving deductions). Research could examine how the role of the advice giver (e.g., economist vs. psychologist) influences a person's willingness to use self-control strategies.

## **Conclusions**

Falling short of financial goals can have substantial consequences for a person's well-being and their financial security. Bringing spending and saving in line with goals can be

difficult, but self-control strategies have the potential to make this process easier and more successful. Indeed, the meta-analysis suggests that overall, financial self-control strategies affect saving and spending decisions with a moderate effect size. In the first part of this dissertation, I gathered an arsenal of 28 financial self-control strategies to combat spending temptations across academic research, online media, and general public perspectives. In the second part of this dissertation, I conducted two longitudinal, experimental studies to assess strategy use and effectiveness. I found simply that providing people with self-control strategies did not increase strategy use or influence spending. However, showing people a video about proactive self-control strategies and asking people to describe the proactive financial self-control strategies they already use led to them spending 13% less during a month than they intended spending at the start of the month.

In sum, this dissertation shows that there are a multitude of strategies to support financial goals. I hope that academics among the readers of this dissertation will be inspired to study those self-control strategies recommended in the media and used by the public that have yet to be tested empirically. I hope that all readers will find inspiration for their personal financial goals in the present compilation of self-control strategies.

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Appendices

Appendix A: Meta-Analysis

Coding Guide and Data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
	Authors	Year	Publication status	Data collection method	Sample type	Country where recruited	Mean Age	Female (%)	Type of strategy used	Strategy group	Control group	Outcome	Dependent measure	Measure Type	Selection bias - Random sequence generation	Selection Bias - Allocation concealment	Performance Bias	Detection bias	Attrition bias	Selective reporting bias
1																				
2	Akbas, Ariely, Robalino, & W	2016	working paper	online	Community	kenya	36.51	34.2	tracking	coin to scratch c	regular reminder	saving - act	in local currency	behavioural	2	2	2	1	3	3
3	Beshears, Choi, Laibson, Ma	2011	working paper	Online	Community	USA	XXX	57	make money hard	commitment ac	liquidity account	saving - act	account allocation	self-report	2	2	2	2	3	3
4	Beshears, Choi, Laibson, Ma	2011	working paper	Online	Community	USA	XXX	57	make money hard	commitment ac	liquidity account	saving - act	account allocation	self-report	2	2	2	2	3	3
5	Davydenko & Peetz, 2020 s1	2020	Published	In-lab	University	Canada	22.45	74	planning	wrote shopping no list		spending - in	local currency	behavioural	2	2	2	2	2	2
6	Davydenko & Peetz, 2020 s2	2020	Published	In-lab	University	Canada	21.55	77	planning	wrote shopping no list		spending - in	local currency	behavioural	2	2	2	2	2	2
7	Escuer & Regal, 2014 s1	2014	thesis/dissert.	Online	Community	Spain	23.1	52	tracking	text after purch	no text after purch	spending - in	local currency	self-report	3	3	2	2	1	3
8	Fajnzylber & Reyes, 2015	2015	Published	Online	Community	Chile	39	63	planning	retirement savi	no statement	saving - act	likelihood make s	behavioural	1	2	2	2	3	3
9	Helion & Gilovich, 2014 s2	2014	Published	In-lab	University	USA	20.6	70	payment method	cash	credit card	spending - in	local currency	behavioural	3	3	2	2	2	3
10	Hershfield, Goldstein, Sharp	2011	Published	In-lab	University	USA	20.13	66	future self	future self proje	current self proje	saving - est	in local currency	self-report	2	2	2	2	3	3
11	Hershfield, Goldstein, Sharp	2011	Published	In-lab	University	USA	21	52.4	future self	future self proje	current self proje	saving - est	account allocation	self-report	2	2	2	2	2	3
12	Prelec & Simester, 2001 s1	2001	Published	in person (c	University	USA	XXX	XXX	payment method	cash	credit card	spending - in	local currency	Self-report	2	2	2	2	3	3
13	Prelec & Simester, 2001 s2	2001	Published	in person (c	University	USA	XXX	XXX	payment method	cash	credit card	spending - in	local currency	Self-report	2	2	2	2	3	3
14	Raghubir & Srivastava, 2008	2008	Published	In-lab	University	USA	21	42.1	payment method	cash	credit card	spending - in	local currency	self-report	2	2	2	2	3	3
15	Raghubir & Srivastava, 2008	2008	Published	In-lab	University	USA	21	57.1	payment method	cash	gift card	spending - in	local currency	behavioural	2	2	2	2	3	3
16	Raghubir & Srivastava, 2008	2008	Published	In-lab	University	USA	XXX	XXX	payment method	cash	gift card	spending - in	local currency	behavioural	2	2	2	2	3	3
17	Raghubir & Srivastava, 2009	2009	Published	In-lab	University	USA	XXX	XXX	denomination effe	large denomina	small denomina	spending - in	local currency	behavioural	2	2	2	2	3	3
18	Raghubir & Srivastava, 2009	2009	Published	in person (c	Community	USA	XXX	XXX	denomination effe	large denomina	small denomina	spending - in	local currency	behavioural	2	2	2	2	3	3
19	Raghubir & Srivastava, 2009	2009	Published	In-lab	Community	China	XXX	100	denomination effe	large denomina	small denomina	spending - in	local currency	behavioural	2	2	2	2	3	3
20	Rudzinska-Wojciechowska, 2017	2017	Published	In-lab	University	Poland	21.11	92.5	construal level frar	abstract	concrete	controlling in	local currency	self-report	2	2	2	2	2	3
21	Rudzinska-Wojciechowska, 2017	2017	Published	in person (c	Community	Poland	37.6	58.2	construal level frar	abstract	concrete	saving - est	in local currency	self-report	2	2	2	2	2	3
22	Sheehan & Van Ittersum, 2018	2018	Published	online	Community	XXX	35.8	49.5	budget	budget (\$60)	no budget	spending - likelihood of choo		behavioural	2	2	2	2	3	3
23	Somville & Vandewalle, 2018	2018	Published	in person (c	Community	India	43	49.77	make money hard	paid in account	paid in cash	saving - act	final account balar	behavioural	2	2	2	2	3	2
24	Tam & Dholakia, 2008 s1	2008	Unpublished	In-lab	University	USA	30.5	49	construal level frar	specific month	next month (Nov	saving - est	in local currency	self-report	2	2	2	2	2	3
25	Tam & Dholakia, 2008 s3	2008	Unpublished	In-lab	University	USA	XXX	XXX	construal level frar	specific month	next month (Nov	saving - est	in local currency	self-report	2	2	2	2	2	3
26	Tam & Dholakia, 2008 s5	2008	Unpublished	In-lab	University	USA	24.47	53	construal level frar	next month	next quarter	saving - est	in local currency	self-report	2	2	2	2	2	3
27	Tessari, Rubaltelli, Tomelleri	2011	Published	In-lab	University	Italy	24	65	denomination effe	pay by banknot	pay by coin	spending - in	local currency	behavioural	2	2	2	2	3	3
28	Tessari, Rubaltelli, Tomelleri	2011	Published	In-lab	University	Italy	24	50	denomination effe	pay by banknot	pay by coin	spending - in	local currency	behavioural	2	2	2	2	3	3
29	Tessari, Rubaltelli, Tomelleri	2011	Published	In-lab	University	Italy	23	72	denomination effe	pay by banknot	pay by coin	spending - in	local currency	behavioural	2	2	2	2	3	3
30	Tessari, Rubaltelli, Tomelleri	2011	Published	In-lab	University	Italy	22	76.7	denomination effe	pay by banknot	pay by coin	spending - in	local currency	behavioural	2	2	2	2	3	3

See Open Science Framework (OSF) for the coding and data: [https://osf.io/5v7mz/?view\\_only=320ed9999780442a8667f53901dc7f41](https://osf.io/5v7mz/?view_only=320ed9999780442a8667f53901dc7f41)

**PRISMA Checklist**

Section and Topic	Item	Checklist item	Location where item is reported
<b>TITLE</b>			
Title	1	Identify the report as a systematic review.	22
<b>ABSTRACT</b>			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	n/a
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	22
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	21, 22
<b>METHODS</b>			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	26
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	23-24
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	23
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	26
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	27-28

Section and Topic	Item	Checklist item	Location where item is reported
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	28-29
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	28-29
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	29
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	28
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	28
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	28
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	30
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	31
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	34
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	32

Section and Topic	Item	Checklist item	Location where item is reported
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	37
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	40
<b>RESULTS</b>			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	23-25
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	26-28
Study characteristics	17	Cite each included study and present its characteristics.	30
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	36
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	33
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	36
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	31-32, 34
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	34-35
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	32

Section and Topic	Item	Checklist item	Location where item is reported
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	37-40
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	40-41
<b>DISCUSSION</b>			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	42
	23b	Discuss any limitations of the evidence included in the review.	42
	23c	Discuss any limitations of the review processes used.	113
	23d	Discuss implications of the results for practice, policy, and future research.	111
<b>OTHER INFORMATION</b>			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	28
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	28
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	28
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	n/a
Competing interests	26	Declare any competing interests of review authors.	n/a
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	28

**Appendix B: Study 1****Media Sample Coding Guide and Data**

<b>Webpage characteristics</b>		
<b>Type of webpage</b>	<b>Author</b>	
financial blog	financial advisor	
other blog	economist	
financial newspaper	researcher	
other newspaper	lay person	
financial magazine	journalist	
other magazine	no author specified	
financial business/organization site	not sure	
other business/organization site		

<b>Strategy characteristics</b>		
<b>Strategy type</b>	<b>Strategy category</b>	<b>Strategy outcome</b>
proactive	make money hard to access	increase saving
reactive	create or use budgets	decrease spending
both proactive and reactive	need vs. want	either saving or spending
not self-control strategy	set/think about your goal	other financial outcome
not sure	avoid spending temptations	
	use coupons, only buy what's on sale, shop for best price, choose no name brands	
	track accounts/spending/saving	
	wait before making the purchase	
	automatize	
	use rewards to motivate self	
	rely on others for support	
	save as much as can	
	think about how much need to work to earn money to buy item	
	make a plan	
	think about past/current difficulties/debt	
	why you want to save more/spend less	
	think about your future self	
	future regret	
	remember your account balance	
	keep your cash only in small bills or coins	
	only use cash for spending	
	savings account with no early withdrawals	
	receive notifications after each purchase	
	use a retirement savings projection plan	
	pay now rather than later	
	avoid - DIY	
	other	

See OSF for the coding and data:

[https://osf.io/tjdzr/?view\\_only=33515d89d39f4ff982ac969a4cb7eaf4](https://osf.io/tjdzr/?view_only=33515d89d39f4ff982ac969a4cb7eaf4)

## Appendix C: Study 2

### Lay Sample Coding Guide and Data

Strategy characteristics		
Strategy type	Strategy category	Strategy outcome
proactive	make money hard to access	increase saving
reactive	create or use budgets	decrease spending
both proactive and reactive	need vs. want	either saving or spending
not self-control strategy	set/think about your goal	other financial outcome
not sure	avoid spending temptations	
	use coupons, only buy what's on sale, shop for best price, choose no name brands	
	track accounts/spending/saving	
	wait before making the purchase	
	automatize	
	use rewards to motivate self	
	rely on others for support	
	save as much as can	
	think about how much need to work to earn money to buy item	
	make a plan	
	think about past/current difficulties/debt	
	why you want to save more/spend less	
	think about your future self	
	future regret	
	remember your account balance	
	keep your cash only in small bills or coins	
	only use cash for spending	
	savings account with no early withdrawals	
	receive notifications after each purchase	
	use a retirement savings projection plan	
	pay now rather than later	
	avoid - DIY	
	other	

See OSF for the coding and data:

[https://osf.io/g6dq2/?view\\_only=af3c9c111fdd47d2851b739e4599755f](https://osf.io/g6dq2/?view_only=af3c9c111fdd47d2851b739e4599755f)

**Study 2 Survey**

First, we'd like to know a little about you, to help us describe the sample of our study better.

Are you ...?

- Male
- Female
- Other

How old are you?

*[text box]*

What is the highest level of education that you have completed?

- Less than a high school diploma
- High school diploma or equivalent
- Some college or university without a degree
- College, trade, vocational, or technical school completed
- University undergraduate degree
- University graduate degree

How is your health in general? (*Arber, Fenn & Meadows, 2014*) Would you say it is....

- Very good
- Good
- Fair
- Bad
- Very bad

How many people live in your household (including yourself)?

*[text box]* adults  
*[text box]* children

What is your marital status?

- Single, never married
- Separated or divorced
- Widowed
- Married or common-law.

Do you live in a home that you...?

- Rent
- Own
- Do not rent or own

**\*NEW PAGE\***

We now have some questions about your finances. When reflecting on these questions, please provide answers as they pertain to you personally rather than to the entire household.

Which best describes your total annual personal income, before taxes?

- Under \$20,000
- \$20,000 – \$29,999
- \$30,000 – \$39,999
- \$40,000 – \$49,999
- \$50,000 – \$59,999
- \$60,000 – \$69,999
- \$70,000 – \$79,999
- \$80,000 – \$99,999
- \$100,000 – \$124,999
- \$125,000 – \$149,999
- \$150,000 or more
- Prefer not to say

How many different sources of income do you personally have in a typical month? (please count both formal and informal sources of income, count both regular income and those that may pay irregularly)

- 1 / 2 / 3 / 4 / 5 / 6 or more

Which of the following is a source of income (select all that apply)?

- Government benefits
- Self-employment
- Employment, paid by the hour
- Salaried employment
- Pension
- Investments
- Other: *[text box]*

Which of the following is your main source of income?

- Government benefits
- Self-employment
- Employment, paid by the hour
- Salaried employment
- Pension
- Investments
- Other: *[text box]*

How often do you receive your main source income?

- Less than once per month
- Once per month
- Every 2 weeks (twice per month)
- Once per week
- It varies from month to month
- Other: *[text box]*

In a typical month, how often does your income include gig work (e.g., MTurk/TaskRabbit; driving for Uber, Lyft)?

- Never
- Sometimes
- About half the time
- Most of the time
- Always

**\*NEW PAGE\***

How much does the amount of money you make change from month to month?

- 1 Income is the same every month – 7 Income change a lot month to month

How much of a change from one month to the next would feel like a big change in your personal income?

- [slide scale]* 0% None of your income change – 100% All of your income changes

**\*NEW PAGE\***

To what degree do you feel you can control how much money you make in a month?

- I have no control at all
- I have a little control
- I have some control
- I have a lot of control
- I have all the control

How much does the source (where the money comes from) change from month to month?

- 1 Same source of income every month – 7 Sources of income change a lot month to month

To what degree do you feel you can control where the money you make comes from?

- I have no control at all
- I have a little control
- I have some control
- I have a lot of control
- I have all the control

**\*NEW PAGE\***

Overall, which of these three income types describes your personal situation best?

- My income is stable.
- My income varies and I have no control over how it varies (for example, I rely on a placement agency to arrange work or rely on a case worker to determine benefit levels)
- My income varies and I have control over how it varies (for example, I can decide how much to make)

**\*NEW PAGE\***

We would like to learn a bit more about your day-to-day work experiences. Thinking overall about your current work.

How often can you decide how much you work (i.e., the number of hours)?

- Never
- Rarely
- Sometimes
- Most of the time
- Always

How often can you decide when you work (i.e., the time of day)?

- Never
- Rarely
- Sometimes
- Most of the time
- Always

How often can you decide which tasks you do in a given day? (e.g., which you do first)

- Never
- Rarely
- Sometimes
- Most of the time
- Always

**\*NEW PAGE\***

What do YOU believe? For each statement below, please indicate the extent to which you agree with that statement. There are no right or wrong answers, we are simply interested in your opinions. *14 items from Rotter's (1966) general Locus of Control Scale (all items that are not about politics or academics) and 4 items from Furnham's (1986) Economic Locus of Control Scale, internal and chance subscales. – FORM A*

Strongly disagree / Disagree / Disagree Somewhat / Neither agree nor disagree / Agree Somewhat / Agree / Strongly Agree

1. Many of the unhappy things in people's lives are partly due to bad luck.
2. In the long run people get the respect they deserve in this world.
3. No matter how hard you try some people just don't like you.
4. I have often found that what is going to happen will happen.
5. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
6. When I make plans I am almost certain that I can make them work.
7. In my case getting what I want has little or nothing to do with luck.
8. Who gets to be the boss often depends on who was luck enough to be in the right place first.
9. Most people don't realize the extent to which their lives are controlled by accidental happenings.
10. It is hard to know whether or not a person really likes you.

11. In the long run the bad things that happen to us are balanced by the good ones.
12. Many times I feel that I have little influence over the things that happen to me.
13. People are lonely because they don't try to be friendly.
14. What happens to me is my own doing.

1. Saving and careful investing is a key factor in becoming rich.
2. In the long run, people who take very good care of their finances stay wealthy.
3. There is little one can do to prevent poverty.
4. It is chiefly a matter of fate whether I become rich or poor.

**\*NEW PAGE\***

Please rate the degree to which you agree with each of the following statements. *Personal well-being* (Diener, Emmons, Larsen, & Griffin, 1985)

1 Strongly disagree – 7 Strongly agree

1. In most ways, my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

Right now, how stressed do you feel about your financial situation? (Frone et al., 1992)

- Not at all stressed
- A little stressed
- Somewhat stressed
- Very stressed
- Extremely stressed

Many times the stresses we encounter outside of our home life can impact our personal relationships. *Work-Life Interference* (Dupre)

How often did your job or career interfere with your responsibility at home, such as yard work, cooking, cleaning, repairs, shopping, paying the bills, or child care in the last week?

- Never
- Very few times
- Sometimes
- Often
- Very often

How often did your job or career keep you from spending the amount of time you would like to spend with your family in the last week?

- Never
- Very few times
- Sometimes
- Often
- Very often

**\*NEW PAGE\***

Most people don't like to wait for their money, but are willing to do so if the wait means they receive a little more money. This is called the point of indifference: The point of indifference is the point at which you think the higher amount is worth waiting for the specified amount of time. For how much money would you wait 1 year rather than taking \$100 now? *Delays (Bartels & Rips, 2010; Frederick, Loewenstein, & O'Donoghue, 2002)*

- A. I would be indifferent between \$100 tomorrow and \$[text box] in one year.
- B. I would be indifferent between \$100 tomorrow and \$[text box] in 5 years.
- C. I would be indifferent between \$100 tomorrow and \$[text box] in 10 years.
- D. I would be indifferent between \$100 tomorrow and \$[text box] in 20 years.
- E. I would be indifferent between \$100 tomorrow and \$[text box] in 30 years.
- F. I would be indifferent between \$100 tomorrow and \$[text box] in 40 years.

**\*NEW PAGE\***

How much do you agree with these statements? *Financial risk aversion items (Gable, 2000; Frone, Russell, & Cooper, 1992)*

1 Strongly agree – 4 Strongly disagree

- 1. In terms of investing, safety is more important than returns.
- 2. I am more comfortable putting money in a bank account than in the stock market.
- 3. When I think of the word "risk" the term "loss" comes to mind immediately.
- 4. Making money in stocks and bonds is based on luck.
- 5. I lack the knowledge to be a successful investor.
- 6. Investing is too difficult to understand.

**\*NEW PAGE\***

Many of us have little tricks we play on ourselves to make us do the things we ought to do or to keep us from the things we ought to forswear. Sometimes we put things out of reach for the moment of temptation, sometimes we promise ourselves small rewards, and sometimes we surrender authority to a trustworthy friend who will police our calories or our cigarettes.

What kinds of strategies do you use in your own life to limit spending and increase saving?  
[text box]

How often do you use such strategies?

- Never
- Sometimes
- About half the time
- Most of the time
- Always

**\*NEW PAGE\***

How much do you agree or disagree with each of the following statements? There are no right or wrong answers. We are interested in your ideas.

Completely Disagree / Disagree / Neutral / Agree / Completely Agree

1. People should be able to resist temptations without resorting to tricks.
2. Using tricks instead of will power is only for people who have trouble controlling their urges.
3. If people use self-control strategies, it shows they have weak will power.
4. If people use self-control strategies, it shows they know how to manage their life well.
5. Using self-control strategies is better than using willpower, it makes life easier.

**\*NEW PAGE\***

*Financial capability (Robson and Splinter, 2012)*

Thinking of the last 12 months, how well have you been keeping up with your financial commitments?

- Having real financial problems and falling behind
- Keeping up but it sometimes is a struggle
- Keeping up without any problems
- I don't know

Thinking of the last 12 months, were you ever behind two months in a row or more...

- ...in paying a bill? (Yes / No / I don't know)
- ...in paying your rent or mortgage? (Yes / No / I don't know)
- ... in making a loan payment? (Yes / No / I don't know)

**\*NEW PAGE\***

Do you have a household budget?

- Yes
- No
- I don't know

**\*NEW PAGE\***

How often do you stay within your budget? [*skip if answer above is "No budget"*]

- I don't know
- Never
- Rarely
- Usually
- Always

How often do you usually check the balances on any bank accounts you have?

- I don't know
- I don't have any accounts
- Yearly
- Monthly
- Every two weeks
- Weekly
- Daily

I keep a close watch on my finances.

- I don't know
- Agree
- Disagree

**\*NEW PAGE\***

Are you planning ahead financially for when you get to retirement age? A plan could include many things like your own savings, government programs, pensions at work, family help, continuing to work, etc.

- I don't know
- Yes
- No
- I'm already retired

How confident are you that your household income in retirement will be what you hope for?

- I don't know
- Not at all confident
- Not very confident
- Fairly confident
- Very confident

**\*NEW PAGE\***

Do you currently have a will?

- Yes
- No
- I don't know

Do you currently have any insurance policies such as life insurance, renters' insurance or car insurance?

- Yes
- No
- I don't know

**\*NEW PAGE\***

If you had a large, unexpected cost, for example equivalent to your take-home pay for at least 2 weeks, how would you mostly likely cover this expense?

- I don't know
- I couldn't cover that kind of cost
- Go to a pawnbroker or payday lender
- Borrow from a bank or use a credit card
- Borrow from friends or family
- Sell an asset or personal possession
- Use savings

Suppose you were to sell all of your major possessions, turn all of your investments and other assets into cash, and pay all of your debts. Would you be in debt, break even, or have something left over?

Would you say the total of your financial assets – all the money you have in bank accounts or investments (other than a pension at work) – is today worth:

- Less than \$500
- \$500 to \$999
- \$1000 to \$2999
- \$3000 to \$4900
- \$5000 to \$6999
- \$7000 to \$9999
- \$10000 or more
- Prefer not to say

**\*NEW PAGE\***

I have a clear idea of the financial products I need.

- I don't know
- Agree
- Disagree

I always research my choices before I make a decision about money.

- I don't know
- Agree
- Disagree

**\*NEW PAGE\***

Are there financial things that you personally keep an eye on? Mark all that apply.

House prices and sales

The stock market

The currency market (i.e.: Canadian vs other dollars)

Interest rates

Inflation

Taxes

The job market

Pension plans or benefits at work

Sales of consumer goods and services

Other

None of the above. I don't keep an eye on financial things.

**\*NEW PAGE\***

In the last five years, have you taken a course or program to learn about financial or economic topics?

Yes

No

I don't know

**\*NEW PAGE\***

How would you rate yourself on each of the following areas of financial management?

Poor / Fair / Good / Very good / Excellent

1. Keeping track of money

2. Making ends meet

3. Planning ahead

4. Shopping around to get the best financial product

5. Staying informed on financial issues

**\*END OF SURVEY\***

## Appendix D: Study 3

Table D1

*Sample Descriptive Information – Study 3*

<i>Sample Demographics</i>	<i>n</i>	<i>Percent</i>	<i>M (SD)</i>	<i>Range</i>
Age in years	303		41.70 (12.79)	21 to 82
Gender				
Male	171	56.6		
Female	131	43.4		
Ethnicity				
American Indian or Alaska Native	2	0.7		
Asian	18	5.9		
Black or African American	25	8.3		
Hispanic, Latino or Spanish Origin	16	5.3		
Middle Eastern or North African	3	1.0		
White	247	81.5		
I prefer not to answer	2	0.7		
Marital status				
Single, never married	93	30.7		
Separated or divorced	26	8.6		
Widowed	6	2.0		
Married or common-law	178	58.7		
Number of adults in household	301		2.01 (0.85)	1 to 5
Number of children in household	275		0.84 (1.01)	0 to 5
Highest level of education				
Less than a high school degree	3	1.0		
High school degree or equivalent	22	7.3		
Some college or university without a degree	40	13.2		
College, trade, vocational, or technical school completed	52	17.2		
University undergraduate degree	106	35.0		
University graduate degree	79	26.1		
Income				
Under \$10,000	16	5.3		
\$10,000 – 19,999	20	6.6		
\$20,000 – \$29,999	39	12.9		
\$30,000 – \$39,999	43	14.2		
\$40,000 – \$49,999	27	8.9		
\$50,000 – \$59,999	41	13.6		
\$60,000 – \$69,999	27	8.9		
\$70,000 – \$79,999	23	7.6		
\$80,000 – \$99,999	28	9.3		
\$100,000 or more	35	11.6		
Prefer not to say	3	1.0		

Number of hours worked per week				
35 or more hours (full-time)	228	75.2		
Less than 35 hours (part-time)	46	15.2		
Not employed	29	9.6		
Employment status changed due to COVID-19 pandemic				
Yes	85	28.1		
No	218	71.9		
How much does your income change month to month?	303		2.93 (1.86)	1 to 7
How stressed do you feel about your financial situation?	301		5.44 (2.81)	1 to 10
<i>Financial Capabilities</i>	<i>n</i>	<i>Percent</i>	<i>M (SD)</i>	<i>Range</i>
In the last year, have you contributed to a savings account?				
Yes, regularly (e.g., every week or month)	180	59.6		
Yes, at least once	82	27.2		
No	38	12.6		
I don't know	2	0.7		
In the last year, have you been behind two months in a row in paying a bill?				
Yes	67	22.2		
No	232	76.8		
I don't know	3	1.0		
In the last year, have you been behind two months in a row in paying rent/mortgage?				
Yes	43	14.2		
No	258	85.1		
I don't know	2	0.7		
In the last year, have you been behind two months in a row in paying a loan?				
Yes	38	12.7		
No	261	87.0		
I don't know	1	0.3		
Do you have a household budget?				
Yes	213	71.0		
No	85	28.3		
I don't know	2	0.7		
Are you planning ahead financially for retirement?				
Yes	213	70.3		
No	65	21.5		
I don't know	6	2.0		
I'm already retired	19	6.3		

<i>Exploratory Scales</i>	<i>n</i>	<i>Percent</i>	<i>M (SD)</i>	<i>Range</i>
Trait self-control	303		3.53 (0.73)	1 to 5
Personality traits				
Extraversion	303		3.45 (1.64)	1 to 7
Agreeableness	303		5.24 (1.24)	1 to 7
Openness	303		5.56 (1.21)	1 to 7
Conscientiousness	303		4.96 (1.45)	1 to 7
Neuroticism	303		4.87 (1.32)	1 to 7
Emotion				
Positive affect	303		4.23 (1.06)	1 to 6
Negative affect	303		2.87 (0.85)	1 to 6

See OSF for full data: [https://osf.io/jwrp3/?view\\_only=14dbd887e5e24dd1abd2c176c2f92682](https://osf.io/jwrp3/?view_only=14dbd887e5e24dd1abd2c176c2f92682)

**Study 3 Intake Survey**

First, we'd like to know a little about you, to help us describe the sample of our study better.

Are you ...?

- Male
- Female
- Other

How old are you?

*[text box]*

What is the highest level of education that you have completed?

- Less than a high school diploma
- High school diploma or equivalent
- Some college or university without a degree
- College, trade, vocational, or technical school completed
- University undergraduate degree
- University graduate degree

How many people live in your household (including yourself)?

*[text box]* adults  
*[text box]* children

What is your marital status?

- Single, never married
- Separated or divorced
- Widowed
- Married or common-law

Please select which ethnicity best describes you? Select all that apply.

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic, Latino or Spanish Origin
- Middle Eastern or North African
- Native Hawaiian or Other Pacific Islander
- White
- Not listed, please specify: \_\_\_\_\_
- I prefer not to answer.

On average, how many hours do you work a week, including time at an office, in the field, or working at home?

- 35 or more hours
- Less than 35 hours
- Not employed

Has your employment status changed due to the COVID-19 pandemic?

Yes

No

**\*NEW PAGE\***

Which best describes your total annual personal income, before taxes?

Under \$10,000

\$ 10,000 – 19,999

\$20,000 – \$29,999

\$30,000 – \$39,999

\$40,000 – \$49,999

\$50,000 – \$59,999

\$60,000 – \$69,999

\$70,000 – \$79,999

\$80,000 – \$99,999

\$100,000 or more

Prefer not to say

How much does the amount of money you make change from month to month?

1 Income is the same every month – 7 Income changes a lot from month to month

Right now, how stressed do you feel about your financial situation? (*Frone et al., 1992*)

1 Not at all stressed – 10 Extremely stressed

**\*NEW PAGE\***

*Financial capability (Robson and Splinter, 2012)*

Thinking of the last 12 months, have you contributed to a savings account (including any savings such as retirement funds, saving for a rainy day, etc.)?

Yes, regularly (e.g., every week or month)

Yes, at least once

No

I don't know

Thinking of the last 12 months, were you ever behind two months in a row or more...

....in paying a bill? (Yes / No / I don't know)

...in paying your rent or mortgage? (Yes / No / I don't know)

... in making a loan payment? (Yes / No / I don't know)

Do you have a household budget?

Yes

No

I don't know

Do you tend to budget (check all that apply)?

- Daily
- Weekly
- Monthly
- Yearly
- Other: *[text box]*
- I do not budget

Are you planning ahead financially for when you get to retirement age? A plan could include many things like your own savings, government programs, pensions at work, family help, continuing to work, etc.

- Yes
- No
- I don't know
- I am already retired

**\*NEW PAGE\***

*randomly assign to 1 of 4: control, willpower, proactive, or reactive strategy condition*

*[control condition]*

Please continue to the next page. Thank you!

**\*NEW PAGE\***

*[willpower condition]*

Please read the information on the next page carefully.

**\*NEW PAGE\*** *[willpower condition]*

Willpower is the force we use to make us do the things we ought to do or to keep us from the things we ought to avoid. People can actually strengthen their self-control muscle with repeated practice that consists of actively resisting immediate temptations (rather than simply avoiding them). For example, when you feel tempted to spend money while shopping, you can use your self-control muscle to help you resist the temptation and to make a decision that is in line with your spending goal.

Throughout the next month, practice resisting temptations when you encounter them. When faced with a temptation to spend money, try to use willpower to resist the temptation.

**\*NEW PAGE\***

*[proactive strategies condition]*

Please read the information on the next page carefully.

**\*NEW PAGE\*** *[proactive strategies condition]*

Many of us have little tricks we play on ourselves to make us do the things we ought to do or to keep us from the things we ought to avoid. These tricks can make self-control easier and can help us make decisions that are in line with our goals.

Here are some specific strategies that you can use to spend less before you even encounter the temptation to spend.

1. Before a spending situation occurs, avoid places that might tempt you to spend money. For example, avoid stores (or parts of stores), online shopping websites, or activities that tempt you to spend money. You can reduce your spending by avoiding those tempting places in your daily life.
2. Before a spending situation occurs, make your money hard to access. For example, you could leave your wallet at home, remove saved payment information from online shopping sites, or even hide your credit cards to limit spending. You can limit your impulse purchase spending by not having ways to spend the money in the spur of the moment.
3. Before a spending situation occurs, plan your purchases and stick to the plan. For example, make a shopping list and only buy what's on the list (in stores or online), plan which stores/sites you visit before going, or plan how much you want to spend. By making a plan beforehand, you can limit purchases to those that are intended and avoid impulse purchases.

*For each strategy:*

How often do you currently use this strategy?

Never

Rarely

Occasionally

Most of the time

All the time

**\*NEW PAGE\*** *[proactive strategies condition]*

Throughout the next month, try to use these three strategies in your daily life.



Avoid tempting places.



Make money hard to access.



Plan purchases.

**\*NEW PAGE\***

*[reactive strategies condition]*

Please read the information on the next page carefully.

**\*NEW PAGE\*** *[reactive strategies condition]*

Many of us have little tricks we play on ourselves to make us do the things we ought to do or to keep us from the things we ought to avoid. These tricks can make self-control easier and can help us make decisions that are in line with our goals.

Here are some specific strategies that you can use to spend less during a tempting situation.

1. In a spending situation, think about whether the item you consider buying is really necessary or whether you just want it. For example, ask yourself why you are buying this item. Is it something that you need or whether it is something that you could go without? Reflecting on whether you need or want the temptation can make it easier to avoid spending money.
2. In a spending situation, wait before completing the purchase. For example, give yourself time to 'cool off' by leaving the item at the store or in your online shopping cart. Later (e.g., the next day, next week, etc.), decide whether you still want to purchase it. Once you are away from the immediate temptation, it'll be easier to make a decision that is in line with your spending goal.
3. In a spending situation, think about whether you would regret this purchase in the future. For example, consider whether in a day, week, month, year, etc. you would regret making this purchase today. Imagining your future regret can change how you experience the temptation to purchase that item today.

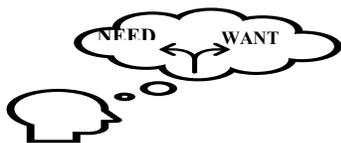
*For each strategy:*

How often do you currently use this strategy?

- Never
- Rarely
- Occasionally
- Most of the time
- All the time

**\*NEW PAGE\*** *[reactive strategies condition]*

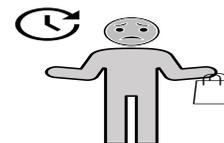
Throughout the next month, try to use these three strategies in your daily life.



Need or want



Cool off



Future regret

**\*NEW PAGE\*** [everyone]

We are interested in your financial goals for the next month (August 2020). Your spending goal for August 2020: Spending goals should include all the money you plan to spend this month, including basic living expenses (e.g., rent/mortgage) and discretionary spending (e.g., entertainment).

What is your spending goal for this month? (in dollars)

[text box]

Briefly state why this is your spending goal for next month.

[text box]

**\*NEW PAGE\***

Now, in the last section of this study, we will ask you some general questions about the type of person you are. Please use the rating scale next to each phrase to describe how accurately each statement describes you. *Trait Self-Control (Tangney, Baumeister, & Boone, 2004)*

1 Not at all like me – 5 Very much like me

1. I am good at resisting temptation.
2. I have a hard time breaking habits.
3. I am lazy.
4. I say inappropriate things.
5. I do certain things that are bad for me, if they are fun.
6. I refuse things that are bad for me.
7. I wish I had more self-discipline.
8. People would say that I have iron self-discipline.
9. Pleasure and fun sometimes keeps me from getting work done.
10. I have trouble concentrating.
11. I am able to work effectively toward long-term goals.
12. Sometimes I can't stop myself from doing something even if I know it's wrong.
13. I often act without thinking through all the alternatives.

**\*NEW PAGE\***

Here are a number of personality traits that may or may not apply to you. Please select a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other. *TUPI (Gosling et al., 2003)*

Disagree strongly / Disagree moderately / Disagree a little / Neither agree nor disagree / Agree a little / Agree moderately / Agree strongly

1. Extraverted, enthusiastic.
2. Critical, quarrelsome.
3. Dependable, self-disciplined.
4. Anxious, easily upset.
5. Open to new experiences, complex.
6. Reserved, quiet.

7. Sympathetic, warm.
8. Disorganized, careless.
9. Calm, emotionally stable.
10. Conventional, uncreative.

**\*NEW PAGE\***

In the past four weeks, how much did you experience each of the following feelings? (*SPANE*,)

Very rarely or Never / Rarely / Sometimes / Often / Very often / The whole time

1. Positive
2. Negative
3. Good
4. Bad
5. Pleasant
6. Unpleasant
7. Happy
8. Sad
9. Afraid
10. Joyful
11. Angry
12. Contented

**\*NEW PAGE\***

Thank you for participating in the intake survey of this study on personal spending. You now qualify to participate in the subsequent surveys for this study. The purpose of this study is to examine people's daily spending experiences over the course of a month. Thus, we would like to contact you 10 times this month to hear about your experiences that day and again on August 31 and September 31. These diary reports and follow-up surveys are shorter than what you filled out today (approx. 5 minutes). For each diary report, you will earn US \$0.50. For completing the monthly follow reports, you will earn \$1.00. Are you interested in receiving email invitations via MTurk to complete additional surveys? You can of course ignore these invitations if you change your mind about participating.

- Yes  
No

**\*END OF SURVEY\***

### Study 3 Diary Survey

To be able to link up your data of the individual reports throughout August with the original survey, please provide your Worker ID address in the space below.

Worker ID: *[text box]*

How will this information be safeguarded? The data collected in this study are confidential. The data will be made available only to the researchers associated with this project (Dr. Johanna Peetz (Faculty member), email: [johanna.peetz@carleton.ca](mailto:johanna.peetz@carleton.ca), phone +1 613 520 2600, ext. 1542), Mariya Davydenko (PhD student, email: [mariyadavydenko@cmail.carleton.ca](mailto:mariyadavydenko@cmail.carleton.ca)).

This information will be kept only until the completion of this study (October 30 2020) and will then be deleted from all data files and the Qualtrics online server.

#### **\*NEW PAGE\***

All the questions below are about your experiences today, from the time you woke up to now.

There are many types of spending situations people encounter. Spending situations include all opportunities where you seriously consider buying something and where you either do or do not buy the product. This could be a small (e.g., coffee) or large (e.g., a coat) expense, could be a regular, necessity (e.g., paying a bill) or a luxury (e.g., treating yourself), could be a situation where the spending would happen online (e.g., Amazon) or in a store (e.g., a restaurant), and it could be a situation where the product in question is intended for yourself or for someone else (e.g., a gift), as long as you are using your personal money to spend it.

How many spending situations did you encounter where you ended up buying something?

0 / 1 / 2 / 3 / 4 / 5 or more

Please describe each situation briefly.

*[text box; show as many lines as the number they selected at the previous question]*

#### **\*NEW PAGE\***

How many spending situations did you encounter where you seriously consider buying something, but you did NOT end up buying it?

0 / 1 / 2 / 3 / 4 / 5 or more

Please describe each situation briefly.

*[text box; show as many lines as the number they selected at the previous question]*

#### **\*NEW PAGE\***

*[control condition]: Nothing*

*[willpower condition; for each spending situation participants described]*

Did you use willpower in this spending situation?

Yes

No

**\*NEW PAGE\***

*[proactive strategy condition; for each spending situation participants described, they will select the strategies they used in that situation]*

What strategies did you use in this spending situation? Select all that apply.

Spending situation: “[pipped text]”



1. Before the spending situation occurred, I avoided places that might tempt me to spend money (e.g., stores, parts of stores, online shopping websites).



2. Before the spending situation occurred, I made it harder for myself to access my money (e.g., I left my wallet at home, removed saved payment information from online shopping sites, or hid my credit cards).



3. Before the spending situation occurred, I planned my purchases and stuck to the plan (e.g., I made a shopping list and only bought what's on the list (in stores or online), planned which stores/sites I will visit before going, or planned how much I want to spend).

4. I used a strategy that is not listed here.

5. I didn't use any strategies.

**\*NEW PAGE\***

*[reactive strategy condition; for each spending situation participants described, they will select the strategies they used in that situation]*

What strategies did you use in this spending situation? Select all that apply.

Spending situation: “[pipped text]”



1. In the spending situation, I thought about whether the item I was considering buying is really necessary or whether I just want it. For example, I thought to myself “is it something that I need or whether it is something that I could go without”?



2. In the spending situation, I waited before completing the purchase to cool off (e.g., I left the item at the store or in my online shopping cart to purchase later).



3. In the spending situation, I thought about whether in the future (e.g., the next day, next week, next year, etc.) I would regret making this purchase today.

4. I used a strategy that is not listed here.
5. I didn't use any strategies.

**\*NEW PAGE\*** *[everyone]*

How much money did you spend today in total (include all expenses)? (in dollars)  
*[text box]*

How many purchases did you make in total today?  
*[text box]*

**\*NEW PAGE\***

How many of these *[piped text]* purchases were objects (i.e., something you can touch with your hand, that you can buy and keep in your possession)?  
*[text box]*

How many of these *[piped text]* purchases were experiences (i.e., for an event that you have/will encounter or live through. In other words, something where you do not end up with anything you could hold in your hand at the end of the experience except for your memories.)?  
*[text box]*

How many of these *[piped text]* purchases were intended for other people (e.g., gift)?  
*[text box]*

How many of these *[piped text]* purchases were intended for yourself?  
*[text box]*

How many of these *[piped text]* purchases were made online?  
*[text box]*

How many of these *[piped text]* purchases were made in person?  
*[text box]*

**\*NEW PAGE\***

How tired do you feel right now?  
1 Not at all – 7 Extremely

How happy do you feel right now?  
1 Not at all – 7 Extremely

**\*END OF SURVEY\***

### Study 3 Exit and Follow-Up Surveys

Thank you for signing on to the follow-up survey for our study on Personal Spending!

To be able to link up your data of the individual reports throughout August with the original survey, please provide your Worker ID address in the space below.

Worker ID: *[text box]*

How will this information be safeguarded? The data collected in this study are confidential. The data will be made available only to the researchers associated with this project (Dr. Johanna Peetz (Faculty member), email: johanna.peetz@carleton.ca, phone +1 613 520 2600, ext. 1542), Mariya Davydenko (PhD student, email: mariyadavydenko@cmail.carleton.ca). This information will be kept only until the completion of this study (October 30 2020) and will then be deleted from all data files and the Qualtrics online server.

**\*NEW PAGE\***

We would now like to hear about your overall spending for the last month (August 2020 /September 2020). If you're unsure of your answers we would appreciate you taking a brief check in your bank account or other sources of financial accounting to be as accurate as possible.

Your spending in August/September 2020: This spending should include all the money you spent this month, including basic living expenses (e.g., rent/mortgage) and discretionary spending (e.g., entertainment).

What did you spend this month? (in dollars)  
*[text box]*

**\*NEW PAGE\***

How often did you use willpower to resist a temptation to spend money during the month of August?

- Never
- Rarely
- Occasionally
- Most of the time
- All the time

**\*NEW PAGE\***

What strategies did you use during the month of August/September to pursue your spending goal?

1. Before the spending situation occurred, I avoided places that might tempt me to spend money (e.g., stores, parts of stores, online shopping websites).

2. Before the spending situation occurred, I made it harder for myself to access my money (e.g., I left my wallet at home, removed saved payment information from online shopping sites, or hid my credit cards).
3. Before the spending situation occurred, I planned my purchases and stuck to the plan (e.g., I made a shopping list and only bought what's on the list (in stores or online), planned which stores/sites I will visit before going, or planned how much I want to spend).
4. In the spending situation, I thought about whether the item I was consider buying is really necessary or whether I just want it. For example, I thought to myself "is it something that I need or whether it is something that I could go without"?
5. In the spending situation, I waited before completing the purchase to cool off (e.g., I left the item at the store or in my online shopping cart to purchase later).
6. In the spending situation, I thought about whether in the future (e.g., the next day, next week, next year, etc.) I would regret making this purchase today.

*for each strategy:*

How often did you use this strategy?

- Never
- Rarely
- Occasionally
- Most of the time
- All the time

How willing are you to use this strategy in the future?

1 Not at all willing – 7 Very willing

If you used any other strategies, please describe them.

*[text box]*

**\*NEW PAGE\***

Overall, how typical was last month in terms of your experiences and actions in general (before the COVID-19 pandemic)?

1 Not at all typical – 7 Extremely typical

Overall, how typical was last month in terms of your spending patterns in general (before the COVID-19 pandemic)?

1 Not at all typical – 7 Extremely typical

Overall, how typical was last month in terms of your experiences and actions since the COVID-19 pandemic began (January 2020)?

1 Not at all typical – 7 Extremely typical

Overall, how typical was last month in terms of your spending patterns since the COVID-19 pandemic began (January 2020)?

1 Not at all typical – 7 Extremely typical

**\*NEW PAGE\***

In the past four weeks, how much did you experience each of the following feelings? (*SPANE*, Diener *et al*)

Very rarely or Never / Rarely / Sometimes / Often / Very often / The whole time

1. Positive
2. Negative
3. Good
4. Bad
5. Pleasant
6. Unpleasant
7. Happy
8. Sad
9. Afraid
10. Joyful
11. Angry
12. Contented
13. Awe
14. Wonder
15. Amazement

**\*NEW PAGE\***

Now, we'd like to know your thoughts about next month. We are interested in your financial goals for September/October 2020.

Your spending goal for September/October 2020: Spending goals should include all the money you plan to spend this month, including basic living expenses (e.g., rent/mortgage) and discretionary spending (e.g., entertainment).

What do you want to spend this month? (in dollars)

*[text box]*

**\*END OF SURVEY\***

## Study 3 Preregistration



**CONFIDENTIAL - FOR PEER-REVIEW ONLY**  
**Personal Spending in the month of August (#45675)**

Created: 08/04/2020 06:37 AM (PT)

Shared: 01/28/2021 08:42 AM (PT)

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This pre-registration is not yet public. This anonymized copy (without author names) was created by the author(s) to use during peer-review. A non-anonymized version (containing author names) will become publicly available only if an author makes it public. Until that happens the contents of this pre-registration are confidential.

---

**1) Have any data been collected for this study already?**

It's complicated. We have already collected some data but explain in Question 8 why readers may consider this a valid pre-registration nevertheless.

**2) What's the main question being asked or hypothesis being tested in this study?**

1. How does using self-control strategies influence spending over the course of a month?
2. Do pro-active or reactive strategies outperform willpower-only or control conditions?

**3) Describe the key dependent variable(s) specifying how they will be measured.**

Money spent in the month of August (controlling for spending goal for August)

**4) How many and which conditions will participants be assigned to?**

Participants will be assigned to one of four conditions:

- proactive strategies (participants will be instructed to use 3 strategies that can be used before a tempting situation occurs)
- reactive strategies (participants will be instructed to use 3 strategies that can be used during a tempting situation)
- willpower (participants will be instructed to use brute willpower when encountering a tempting situation)
- control (empty control; participants will not be instructed to use any self-control strategies or willpower)

This is a longitudinal study with an intake survey, 10 diary reports throughout the month of August, an exit survey on August 31, and follow-up survey on September 30.

**5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.**

1. mixed-model ANOVA accounting for within-participant variance.
2. follow-up contrasts comparing the four conditions.

**6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.**

Participants will be excluded if they write nonsense in the open-ended response boxes that ask participants to describe their spending goal in the intake survey (e.g., if they write "good" or an irrelevant sentence like the dictionary definition of a goal). Outliers will be defined as +/- 3 Standard Deviations from the mean and participants with outliers in spending goal or actual spending will be excluded from relevant analyses.

**7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.**

We posted 500 participation slots on Mturk for the intake survey. Assuming 40% attrition, this will leave us with about 300 usable participants who complete both the intake and the exit survey and some of the diaries. This will allow us to detect small to medium effect sizes ( $f \geq 0.20$ ) of the condition variable with 80% power.

**8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)**

This pre-registration was created after the intake data has been collected (on August 1st) but before the diaries/followup data has been collected. Data has not yet been downloaded or analyzed. Note that the sample size has been "registered" via an internal ethics review prior to the start of data collection.

Available at <https://aspredicted.org/blind.php?x=ue9nq2>

## Appendix E: Study 4

Table E1

*Sample Descriptive Information – Study 4*

<i>Sample Demographics</i>	<i>n</i>	<i>Percent</i>	<i>M (SD)</i>	<i>Range</i>
Age in years	360		41.52 (13.11)	18 to 83
Gender				
Male	193	53.5		
Female	168	46.5		
Ethnicity				
American Indian or Alaska Native	5	1.4		
Asian	42	11.6		
Black or African American	23	6.4		
Hispanic, Latino or Spanish Origin	15	4.1		
Middle Eastern or North African	2	0.6		
Native Hawaiian or Other Pacific Islander	1	0.3		
White	292	80.7		
I prefer not to answer	3	0.8		
Marital status				
Single, never married	141	39.1		
Separated or divorced	47	13.0		
Widowed	10	2.8		
Married or common-law	163	45.2		
Number of adults in household	360		1.94 (0.83)	1 to 6
Number of children in household	335		0.61 (1.10)	0 to 11
Highest level of education				
Less than a high school degree	2	0.6		
High school degree or equivalent	21	5.8		
Some college or university without a degree	65	18.0		
College, trade, vocational, or technical school completed	73	20.2		
University undergraduate degree	135	37.4		
University graduate degree	65	18.0		
Income				
Under \$10,000	21	5.8		
\$10,000 – 19,999	45	12.4		
\$20,000 – \$29,999	47	13.0		
\$30,000 – \$39,999	54	14.9		
\$40,000 – \$49,999	39	10.8		
\$50,000 – \$59,999	35	9.7		
\$60,000 – \$69,999	34	9.4		
\$70,000 – \$79,999	27	7.5		
\$80,000 – \$99,999	31	8.6		
\$100,000 or more	29	8.0		

Number of hours worked per week				
35 or more hours (full-time)	242	66.9		
Less than 35 hours (part-time)	69	19.1		
Not employed	51	14.1		
Employment status changed due to COVID-19 pandemic				
Yes	66	18.2		
No	296	81.8		
How much do you control how much you make in a month?	361		2.86 (0.06)	1 to 5
How stressed do you feel about your financial situation?	361		5.09 (0.14)	1 to 10
<i>Financial Capabilities</i>	<i>n</i>	<i>Percent</i>	<i>M (SD)</i>	<i>Range</i>
In the last year, have you contributed to a savings account?				
Yes, regularly (e.g., every week or month)	206	57.1		
Yes, at least once	96	26.6		
No	58	16.1		
I don't know	1	0.3		
In the last year, have you been behind two months in a row in paying a bill?				
Yes	39	10.8		
No	322	89.0		
I don't know	1	0.3		
In the last year, have you been behind two months in a row in paying rent/mortgage?				
Yes	18	5.0		
No	343	95.0		
In the last year, have you been behind two months in a row in paying a loan?				
Yes	21	5.8		
No	341	94.2		
Do you have a household budget?				
Yes	273	75.4		
No	87	24.0		
I don't know	2	0.6		
Are you planning ahead financially for retirement?				
Yes	247	68.2		
No	78	21.5		
I don't know	11	3.0		
I'm already retired	26	7.2		

<i>Exploratory Scales</i>	<i>n</i>	<i>Percent</i>	<i>M (SD)</i>	<i>Range</i>
Trait self-control	361		3.68 (0.04)	1 to 5
Emotion				
Positive affect	361		4.05 (0.05)	1 to 6
Negative affect	361		2.61 (0.04)	1 to 6
Regulatory focus				
Promotion focus	362		3.09 (0.02)	1 to 5
Prevention focus	362		2.74 (0.04)	1 to 5
Goal motivation				
Autonomous motivation	362		4.74 (0.07)	1 to 7
Controlled motivation	362		2.49 (0.08)	1 to 7

*Note.* The only significant difference by condition was for income,  $F(2, 359) = 6.94, p = .001$ , and marital status,  $\chi^2 (N = 361, df = 6) = 19.12, p = .004$ . None of the other demographic, financial capabilities, or exploratory scale variables significantly differed by condition. Including income and marital status as covariates in the main test of the condition effect on monthly spending did not change the findings of the condition effect,  $F(2, 355) = 5.71, p = .004$ , *partial*  $\eta^2 = .031$ .

See OSF for full data: [https://osf.io/ykvf9/?view\\_only=a2f3197e568f46b5905bce768ee3f666](https://osf.io/ykvf9/?view_only=a2f3197e568f46b5905bce768ee3f666)

**Study 4 Intake Survey**

First, we'd like to know a little about you, to help us describe the sample of our study better.

Are you ...?

- Male
- Female
- Other

How old are you?

*[text box]*

What is the highest level of education that you have completed?

- Less than a high school diploma
- High school diploma or equivalent
- Some college or university without a degree
- College, trade, vocational, or technical school completed
- University undergraduate degree
- University graduate degree

How many people live in your household (including yourself)?

*[text box]* adults  
*[text box]* children

What is your marital status?

- Single, never married
- Separated or divorced
- Widowed
- Married or common-law

Please select which ethnicity best describes you? Select all that apply.

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic, Latino or Spanish Origin
- Middle Eastern or North African
- Native Hawaiian or Other Pacific Islander
- White
- Not listed, please specify: *[text box]*
- I prefer not to answer

On average, how many hours do you work a week, including time at an office, in the field, or working at home?

- 35 or more hours
- Less than 35 hours
- Not employed

Has your employment status changed due to the COVID-19 pandemic?

Yes

No

**\*NEW PAGE\***

We now have some questions about your finances. When reflecting on these questions, please provide answers as they pertain to you personally rather than to the entire household.

Which best describes your total annual personal income, before taxes?

Under \$10,000

\$ 10,000 – 19,999

\$20,000 – \$29,999

\$30,000 – \$39,999

\$40,000 – \$49,999

\$50,000 – \$59,999

\$60,000 – \$69,999

\$70,000 – \$79,999

\$80,000 – \$99,999

\$100,000 or more

Prefer not to say

To what degree do you feel you can control where the money you make comes from?

I have no control at all

I have a little control

I have some control

I have a lot of control

I have all the control

Right now, how stressed do you feel about your financial situation? (*Frone et al., 1992*)

1 Not at all stressed – 10 Extremely stressed

*Financial capability (Robson and Splinter, 2012)*

Thinking of the last 12 months, have you contributed to a savings account (including any savings such as retirement funds, saving for a rainy day, etc.)?

Yes, regularly (e.g., every week or month)

Yes, at least once

No

I don't know

Thinking of the last 12 months, were you ever behind two months in a row or more...

...in paying a bill? (Yes / No / I don't know)

...in paying your rent or mortgage? (Yes / No / I don't know)

... in making a loan payment? (Yes / No / I don't know)

Do you have a household budget?

- Yes
- No
- I don't know

Do you tend to budget (check all that apply)?

- Daily
- Weekly
- Monthly
- Yearly
- Other: *[text box]*
- I do not budget

Are you planning ahead financially for when you get to retirement age? A plan could include many things like your own savings, government programs, pensions at work, family help, continuing to work, etc.

- Yes
- No
- I don't know
- I am already retired

**\* NEW PAGE \***

We are interested in your financial goals for the next month (March 2021). Spending goals should include all the money you plan to spend this month, including basic living expenses (e.g., rent/mortgage) and discretionary spending (e.g., entertainment).

What is your spending goal for this month? (in dollars)

*[text box]*

**\* NEW PAGE \***

*randomly assign to 1 of 3: control, proactive, or reactive strategy condition*

*[control condition]*

Please describe your three most recent spending situations. These situations can include both in person and online shopping. Please describe where the spending took place and what you purchased in each of the situations.

Spending situation 1: *[text box]*

Spending situation 2: *[text box]*

Spending situation 3: *[text box]*

**\*NEW PAGE\***

*[proactive strategies condition]*

Many of us have little tricks we play on ourselves to make us do the things we ought to do or to keep us from the things we ought to avoid. These tricks can make self-control easier and can help us make decisions that are in line with our goals.

Watch the video on the next page for some specific strategies that you can use to spend less before you even encounter the temptation to spend.

**\* NEW PAGE\*** *[proactive strategies condition]*

*[video: <https://youtu.be/iNExzT64Vhk>]*

*[button to continue to the next page appeared after 90 seconds]*

**\*NEW PAGE\*** *[proactive strategies condition]*

Now that you are more familiar with things you can do before a spending temptation, we'd like to hear what you personally do to help you bring your spending decisions in line with your goal.

Please describe three strategies you currently use BEFORE you encounter a spending temptation. These should be strategies you use before going to a store, seeing the item, or logging on an online store. If you use the strategies described in the video, please describe how you use them.

Strategy 1: *[text box]*

Strategy 2: *[text box]*

Strategy 3: *[text box]*

**\*NEW PAGE\*** *[proactive strategies condition]*

*For each strategy participants described:*

How often do you currently use this strategy?

Never

Rarely

Occasionally

Most of the time

All the time

When do you use this strategy?

1 Mostly before a spending temptation – 7 Mostly during a spending temptation

**\*NEW PAGE\*** *[proactive strategies condition]*

Throughout the next month, try to use these specific strategies more in your daily life. Focus on what you can do to be proactive and the strategies you can use in advance of a spending temptation.

Strategy 1: *[piped text]*

Strategy 2: *[piped text]*

Strategy 3: *[piped text]*

**\*NEW PAGE\***

*[reactive strategies condition]*

Many of us have little tricks we play on ourselves to make us do the things we ought to do or to keep us from the things we ought to avoid. These tricks can make self-control easier and can help us make decisions that are in line with our goals.

Please watch the video on the next page for some specific strategies that you can use to spend less during a tempting situation.

**\*NEW PAGE\*** *[reactive strategies condition]*

*[video: <https://youtu.be/deulpV4kPhc>]*

*[button to continue to the next page appeared after 90 seconds]*

**\*NEW PAGE\*** *[reactive strategies condition]*

Now that you are more familiar with things you can do during a spending temptation, we'd like to hear what you personally do to help you bring your spending decisions in line with your goal.

Please describe three strategies you currently use DURING a spending temptation. These should be strategies you use once you are at the store, see the item, or once logged on an online store. If you use the strategies described in the video, please describe how you use them.

Strategy 1: *[text box]*

Strategy 2: *[text box]*

Strategy 3: *[text box]*

**\*NEW PAGE\*** *[reactive strategies condition]*

*For each strategy participants described:*

How often do you currently use this strategy?

Never

Rarely

Occasionally

Most of the time

All the time

When do you use this strategy?

1 Mostly before a spending temptation – 7 Mostly during a spending temptation

**\*NEW PAGE\*** *[reactive strategies condition]*

Throughout the next month, try to use these specific strategies more in your daily life. Focus on what you can do once you are tempted and the strategies you can use in the spending temptation.

Strategy 1: *[piped text]*

Strategy 2: *[piped text]*

Strategy 3: *[piped text]*

**\*NEW PAGE\*** [everyone]

Now, in the last section of this study, we will ask you some general questions about the type of person you are.

Please use the rating scale next to each phrase to describe how accurately each statement describes you. *Trait Self-Control (Tangney, Baumeister, & Boone, 2004)*

1 Not at all like me – 5 Very much like me

1. I am good at resisting temptation.
2. I have a hard time breaking habits.
3. I am lazy.
4. I say inappropriate things.
5. I do certain things that are bad for me, if they are fun.
6. I refuse things that are bad for me.
7. I wish I had more self-discipline.
8. People would say that I have iron self-discipline.
9. Pleasure and fun sometimes keeps me from getting work done.
10. I have trouble concentrating.
11. I am able to work effectively toward long-term goals.
12. Sometimes I can't stop myself from doing something even if I know it's wrong.
13. I often act without thinking through all the alternatives.

**\*NEW PAGE\***

In the past four weeks, how much did you experience each of the following feelings? (*SPANE, Diener et al*)

Very rarely or Never / Rarely / Sometimes / Often / Very often / The whole time

1. Positive
2. Negative
3. Good
4. Bad
5. Pleasant
6. Unpleasant
7. Happy
8. Sad
9. Afraid
10. Joyful
11. Angry
12. Contented

**\*NEW PAGE\***

Thank you for participating in the intake survey of this study on personal spending. You now qualify to participate in the subsequent surveys for this study.

The purpose of this study is to examine people's daily spending experiences over the course of a month. Thus, we would like to contact you 10 times this month to hear about your experiences that day and again on March 31. These diary reports and follow-up survey are shorter than what you filled out today (approx. 5 minutes). For each diary report, you will earn US \$0.50. For completing the monthly follow report, you will earn \$1.00. You qualify for these surveys, and they will show up on your dashboard as they become available.

Would you also like to receive email invitations via MTurk? You can of course ignore these invitations if you change your mind about participating.

Yes

No

**\*END OF SURVEY\***

### Study 4 Diary Survey

To be able to link up your data of the individual reports throughout March with the original survey, please provide your Worker ID address in the space below.

Worker ID: *[text box]*

How will this information be safeguarded? The data collected in this study are confidential. The data will be made available only to the researchers associated with this project (Dr. Johanna Peetz (Faculty member), email: johanna.peetz@carleton.ca, phone +1 613 520 2600, ext. 1542), Mariya Davydenko (PhD student, email: mariyadavydenko@cmail.carleton.ca). This information will be kept only until the completion of this study (April 30, 2021) and will then be deleted from all data files and the Qualtrics online server.

**\*NEW PAGE\***

All the questions below are about your experiences today, from the time you woke up to now.

There are many types of spending situations people encounter. Spending situations include all opportunities where you seriously consider buying something and where you either do or do not buy the product. This could be a small (e.g., coffee) or large (e.g., a coat) expense, could be a regular, necessity (e.g., paying a bill) or a luxury (e.g., treating yourself), could be a situation where the spending would happen online (e.g., Amazon) or in a store (e.g., a restaurant), and it could be a situation where the product in question is intended for yourself or for someone else (e.g., a gift), as long as you are using your personal money to spend it.

How many spending situations did you encounter where you ended up buying something?

0 / 1 / 2 / 3 / 4 / 5 or more

How many spending situations did you encounter where you seriously consider buying something, but you did NOT end up buying it?

0 / 1 / 2 / 3 / 4 / 5 or more

**\*NEW PAGE\***

*[control condition]: Nothing*

*[proactive strategy condition]*

Please describe the strategies you used BEFORE you encountered spending temptations. These should be strategies you use before going to a store, seeing an item, or logging on an online store.

Strategy 1: *[text box]*

Strategy 2: *[text box]*

Strategy 3: *[text box]*

I did not use any strategies

**\*NEW PAGE\***

*For each proactive strategy described:* How often do you currently use this strategy?

- Never
- Rarely
- Occasionally
- Most of the time
- All the time

**\*NEW PAGE\***

*[reactive strategy condition]*

Please describe the strategies you used DURING a spending temptation. These should be strategies you use once you are at the store, see an item, or once logged on an online store.

- Strategy 1: *[text box]*
- Strategy 2: *[text box]*
- Strategy 3: *[text box]*
- I did not use any strategies

**\*NEW PAGE\***

*For each reactive strategy described:* How often do you currently use this strategy?

- Never
- Rarely
- Occasionally
- Most of the time
- All the time

**\*NEW PAGE\*** *[everyone]*

How much money did you spend today in total (include all expenses)? (in dollars)

*[text box]*

How many purchases did you make in total today?

*[text box]*

How many of these *[piped text]* purchases were...

- intended for other people (e.g., gift)? *[text box]*
- intended for yourself? *[text box]*
- made online? *[text box]*
- made in person? *[text box]*

**\*NEW PAGE\***

How tired do you feel right now?

1 Not at all – 7 Extremely

How happy do you feel right now?

1 Not at all – 7 Extremely

**\*END OF SURVEY\***

### Study 4 Exit Survey

Thank you for signing on to the follow-up survey for our study on Personal Spending!

To be able to link up your data of the individual reports throughout March with the original survey, please provide your Worker ID address in the space below.

Worker ID: *[text box]*

How will this information be safeguarded? The data collected in this study are confidential. The data will be made available only to the researchers associated with this project (Dr. Johanna Peetz (Faculty member), email: johanna.peetz@carleton.ca, phone +1 613 520 2600, ext. 1542), Mariya Davydenko (PhD student, email: mariyadavydenko@cmail.carleton.ca). This information will be kept only until the completion of this study (April 30, 2021) and will then be deleted from all data files and the Qualtrics online server.

**\*NEW PAGE\***

We would now like to hear about your overall spending for the last month (March 2021). If you're unsure of your answers we would appreciate you taking a brief check in your bank account or other sources of financial accounting to be as accurate as possible.

Your spending in March 2021: This spending should include all the money you spent this month, including basic living expenses (e.g., rent/mortgage) and discretionary spending (e.g., entertainment).

What did you spend this month? (in dollars)

*[text box]*

**\*NEW PAGE\***

What strategies did you use during the month of March to pursue your spending goal? For each strategy description, rate how often you used it during the month.

1. Before the spending temptation occurred, I avoided places that might tempt me to spend money (e.g., stores, parts of stores, online shopping websites).
2. Before the spending temptation occurred, I made it harder for myself to access my money (e.g., I left my wallet at home, removed saved payment information from online shopping sites, or hid my credit cards).
3. Before the spending temptation occurred, I made a budget to plan my spending (e.g., I made a weekly or monthly budget at the start of the month).
4. In the spending temptation, I thought about whether in the future (e.g., the next day, next month, next year, etc.) I would regret making this purchase today.
5. In the spending temptation, I thought about why I am pursuing this spending goal (e.g., because I want to put money aside for retirement or vacation).
6. In the spending temptation, I thought about my future self (e.g., in months, years) and how my spending today will impact this future self.

*For each strategy:* How often did you use these strategies?

- Never
- Rarely
- Occasionally
- Most of the time
- All the time

**\*NEW PAGE\***

What other strategies did you use? Please describe them and rate how often you used each one.

Strategy 1: *[text box]*

Strategy 2: *[text box]*

Strategy 3: *[text box]*

*For each strategy described:* How often did you use these strategies?

- Never
- Rarely
- Occasionally
- Most of the time
- All the time

**\*NEW PAGE\***

Over the month, did you use the strategies mostly BEFORE you encountered a spending temptation (e.g., before going to a store, seeing the item, or logging on an online store) or mostly DURING a spending temptation (e.g., once you are at the store, see the item, or once logged on an online store)?

- 1 Mostly before a spending situation – 7 Mostly during a spending situation

**\*NEW PAGE\***

Overall, how typical was last month in terms of your experiences and actions in general?

- 1 Not at all typical – 7 Extremely typical

Overall, how typical was last month in terms of your spending patterns in general?

- 1 Not at all typical – 7 Extremely typical

**\*NEW PAGE\***

What was the spending goal you had for last month? (i.e., your goal for how much you intended to spend in the month of March across all discretionary and fixed expenses)

*[text box]*

Think about the reasons that you have for this goal. When thinking specifically about the spending goal you had for the past month, to what degree were you pursuing this goal for each of the reasons listed below?

- 1 Not at all – 7 Very

1. Because somebody else (parent, partner, friend, employer, etc.) wants you to, or because you'd get something from someone if you did.
2. Because you would feel ashamed, guilty, or anxious if you didn't—you felt that you should try to accomplish this goal.
3. Because you really believe that it is an important goal to have.
4. Because of the fun and enjoyment which the goal provides you—your interest in the experience itself.
5. Because it represents who you are and reflects what you valued most in life.

**\*NEW PAGE\***

If you were trying to find strategies to help you reduce your spending or increase your saving, what terms would you enter in a Google search bar?

*[text box]*

**\*NEW PAGE\***

In the past four weeks, how much did you experience each of the following feelings? (*SPANE, Diener et al*)

Very rarely or Never / Rarely / Sometimes / Often / Very often / The whole time

1. Positive
2. Negative
3. Good
4. Bad
5. Pleasant
6. Unpleasant
7. Happy
8. Sad
9. Afraid
10. Joyful
11. Angry
12. Contented

**\*NEW PAGE\***

Finally, we have a question about the experience of this study. We are simply interested in your personal experience, there are no correct or wrong answers to this question.

Some of the participants in this study were given links to videos on the last page of the surveys we sent throughout the past month. These videos were just meant as additional resource. How many times did you click on the video link?

- Never
- Once
- Several times
- Every time

**\*END OF SURVEY\***

## Study 4 Preregistration

**CONFIDENTIAL - FOR PEER-REVIEW ONLY****Personal Spending in the month of March (#59473)**

Created: 02/26/2021 11:01 AM (PT)

Shared: 03/14/2021 05:55 PM (PT)

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This pre-registration is not yet public. This anonymized copy (without author names) was created by the author(s) to use during peer-review. A non-anonymized version (containing author names) will become publicly available only if an author makes it public. Until that happens the contents of this pre-registration are confidential.

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**1) Have any data been collected for this study already?**

No, no data have been collected for this study yet.

**2) What's the main question being asked or hypothesis being tested in this study?**

How does using self-control strategies influence spending over the course of a month?

1. Listing proactive strategies reduces spending compared to the control condition.
2. Listing proactive strategies reduces spending compared to the reactive strategies condition.

**3) Describe the key dependent variable(s) specifying how they will be measured.**

Money spent in the month of March (controlling for the spending goal for March)

**4) How many and which conditions will participants be assigned to?**

Participants will be assigned to one of three conditions:

- proactive strategies (participants will be asked to describe 3 proactive strategies they use and will be instructed to use more proactive strategies throughout the month)
- reactive strategies (participants will be asked to describe 3 reactive strategies they use and will be instructed to use more reactive strategies throughout the month)
- control (empty control; participants will not be instructed to use any self-control strategies or be asked to describe any strategies they use; instead they describe a recent spending situation)

This is a longitudinal study with an intake survey (March 1, 2021), 10 diary reports throughout the month of March, and an exit survey (March 31, 2021).

**5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.**

1. ANOVA with condition as predictor variable.
2. follow-up contrasts comparing the three conditions, specifically proactive to control, proactive to reactive, reactive to control.

**6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.**

Participants will be excluded if they write nonsense in the open-ended response boxes that ask participants to describe their proactive strategies (proactive condition), reactive strategies (reactive condition), or last spending situation (control condition). An example of a nonsense response would be if they write "good" or an irrelevant sentence, like the dictionary definition of a goal. Additionally, participants who report a spending goal or monthly spending that is equal or greater than double their monthly income will be excluded (if there are any).

Outliers will be defined as +/- 3 Standard Deviations from the mean and participants with outliers in spending goal or monthly spending will be excluded from only the analyses that use this variable.

**7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.**

We will post 600 participation slots on Mturk for the intake survey. Assuming 40% attrition and exclusions, this will leave us with about 360 usable participants who complete both the intake and the exit survey. This will allow us to detect small to medium effect sizes ( $f = 0.17$ ) of the condition variable with 80% power.

**8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)**

We collect a number of other exploratory variables.

## **Appendix F: Two Additional Studies on Strategy Use and Perceptions**

*NOTE: This study was conducted in November 2018, before I updated the meta-analysis literature search. The 13 strategies included in this study are not all of the strategies in the current meta-analysis (18 strategies).*

### **Study A: Use and Perceptions of 13 Financial Self-Control Strategies**

The purpose of this study was to examine people's perceptions of the financial self-control strategies found in the academic literature through the meta-analysis search. In this study, I described the self-control strategies to participants and asked them to rate their self-reported perceptions and use of these strategies (i.e., a recognition task, Gillund & Shiffrin, 1984). In these initial studies, I included all 13 self-control strategies discovered through the meta-analysis search, including the self-control strategies examined in articles that were excluded from the meta-analysis due to missing statistical information. Study A assessed strategy use and perceived effectiveness. Study B extended on these questions by also recording the sources of information where people learned about these self-control strategies.

## **Methods**

### ***Participants***

I recruited 220 participants from Amazon's Mechanical Turk (MTurk) to complete a 10-minute online study. Participants were compensated with \$0.50. There were no exclusion criteria to participate in this study, but recruitment was limited to only Canadian and American MTurk workers. Two participants were excluded because they did not describe a financial goal resulting in a final sample of 218 participants (43.6% female;  $M_{\text{age}} = 36.61$  years,  $SD_{\text{age}} = 12.33$ ;  $\text{range}_{\text{age}} = 19$  to 81 years old). Participants' highest level of education included postgraduate degrees (9.8%,  $n = 21$ ), college degrees (full degree: 48.4%,  $n = 104$ ; some college: 29.8%,  $n = 64$ ), and high school degrees (12.1%,  $n = 26$ ). Participants' median household income before taxes was

\$50,000 – \$59,999, similar to the median household income in the USA (\$61,372; Fontenot et al., 2018).

### ***Procedure***

After completing the informed consent, participants completed a brief demographic questionnaire reporting their age, gender, highest level of education, and total annual household income. Next, participants were asked to describe one of their current financial goals: a saving goal (where one intends to save more) or a spending goal (where one intends to reduce spending). The goal could be long-term (e.g., retirement savings), short-term (e.g., staying within budget when grocery shopping), recurrent (e.g., monthly spending goal), or a one-time goal (e.g., saving to buy a new TV).

After thinking about and describing a personal financial goal, participants were presented with the 13 self-control strategies identified in the meta-analysis search. Each strategy with its corresponding questions were presented on separate pages. On each page, participants were given a brief description of the strategy followed by items to assess familiarity with the strategy (“Some people use this strategy to help them achieve their financial goals. Have you heard of this strategy before?”; *Yes / No*), frequency of past use (“How often have you used this strategy in the past?”; 1 = *Never* to 7 = *All the time*), perceived effectiveness in general (“How effective do you think this strategy is in helping people achieve their financial goals?”; 1 = *Not at all effective* to 7 = *Very effective*), perceived effectiveness for the participant themselves (“How effective do you think this strategy is in helping you personally to achieve your financial goals?”; 1 = *Not at all effective* to 7 = *Very effective*), and likelihood of future use (“How likely are you to use this strategy in the future?”; 1 = *Not at all likely* to 7 = *Very likely*). A description of the 13 self-control strategies is presented in the Study A study materials. After rating each of the

strategies, participants described any other strategies they use to help them achieve their saving and spending goals, as well as their overall willingness to use strategies when pursuing a financial goal (1 = *Not at all willing* to 7 = *Very willing*).

## **Results**

### ***Overall Strategy Use and Perceptions***

Participants reported they were highly willing to use any strategy when pursuing a financial goal ( $M = 6.14$ ,  $SD = 1.03$ ). All participants reported hearing about at least one of the self-control strategies, with 18.3% reporting that they have heard of all 13 strategies. On average, participants heard of about 10 of the 13 strategies ( $M = 9.96$ ,  $SD = 2.86$ ). The more strategies the participant was familiar with, the more often they reported using strategies in the past ( $r(212) = .37$ ,  $p < .001$ ), the more effective they thought strategies were (for others:  $r(212) = .34$ ,  $p < .001$ ; for themselves:  $r(212) = .34$ ,  $p < .001$ ), and the more they anticipated using strategies in the future ( $r(212) = .31$ ,  $p < .001$ ). Age, gender, income, and education were not significantly correlated with general strategy familiarity, past use, future use, and perceived effectiveness for others and for themselves.

Participants reported that they perceived self-control strategies to be more effective in helping other people pursue their goals ( $M = 4.81$ ,  $SD = 0.89$ ), than for them personally ( $M = 4.47$ ,  $SD = 1.00$ ),  $t(211) = 9.52$ ,  $p < .001$ ,  $d = 1.31$ . Participants reported moderately frequent strategy use in the past ( $M = 3.92$ ,  $SD = 0.98$ ) and anticipated moderate likelihood of use in the future ( $M = 4.44$ ,  $SD = 1.00$ ).

### ***Comparing Proactive Versus Reactive Strategies***

Using the same categorization as used in the meta-analysis, I compared proactive ( $n = 6$ ) and reactive ( $n = 7$ ) strategies for past use, future use, and perceived effectiveness for others and

for themselves. A paired samples t-test revealed participants reported using significantly more of the listed reactive strategies in the past than the listed proactive strategies (see Table F1 for means). Participants perceived proactive strategies as more effective than reactive strategies for both others (significant) and for themselves (marginally significant).

**Table F1**

*Use and Perceived Effectiveness of Proactive and Reactive Strategies*

	Proactive <i>M (SE)</i>	Reactive <i>M (SE)</i>	Paired <i>t</i> -test
Past use	3.75 (0.09)	4.05 (0.07)	$t(209) = 3.28, p = .001, d = 0.23$
Future use	4.48 (0.08)	4.39 (0.08)	$t(209) = 1.19, p = .235, d = 0.08$
Effective for others	5.01 (0.07)	4.64 (0.07)	$t(209) = 5.82, p < .001, d = 0.40$
Effective for self	4.45 (0.08)	4.31 (0.07)	$t(209) = 1.90, p = .058, d = 0.13$

## **Study B: Antecedents of Knowledge for 13 Financial Self-control Strategies**

### **Methods**

#### ***Participants***

I recruited 231 participants from Amazon's MTurk to complete a 10-minute online study. Participants were compensated with \$0.50. Those who participated in the first study were excluded from recruitment in this study and recruitment was limited to only Canadian and American MTurk workers. Seventeen participants were excluded from the analysis for failing to rate at least one of the self-control strategies. The final sample included 214 participants (56.5% female;  $M_{\text{age}} = 39.52$  years,  $SD_{\text{age}} = 10.64$ ;  $\text{range}_{\text{age}} = 20$  to 72 years old). Participants' highest level of education included postgraduate degrees (13.1%,  $n = 28$ ), college degrees (full degree: 42.1%,  $n = 90$ ; some college: 29.4%,  $n = 63$ ), and high school degrees (full degree: 13.6%,  $n = 29$ ; some high school: 0.9%,  $n = 2$ ). Participants' median household income before taxes was \$50,000 – \$59,999.

#### ***Procedure***

As in Study A, after completing the informed consent, participants were asked to complete a brief demographic questionnaire, to describe a personal financial goal, and to rate their general willingness to use any strategies when pursuing a financial goal (1 = *Not at all willing* to 7 = *Very willing*). Next, participants were presented with a description of one of the 13 self-control strategies and were asked to complete four items regarding each strategy. Similar to Study A, participants rated how familiar they are with the strategy (1 = *Never heard of it* to 7 = *Know very well*), how often they personally used this strategy in the past (1 = *Never* to 7 = *All the time*), and how likely they are to use the strategy in the future (1 = *Not at all likely* to 7 = *Very likely*). Participants also reported where they heard about each strategy by selecting all

sources of information that apply. The sources were aggregated into four categories: social sources (“From someone I know personally (e.g. a colleague, friend, family member)”, “From someone I don’t know personally (e.g., story by a Blogger)”), official sources (“From a government information campaign”, “From my bank/financial advisor”, “From reading an academic paper”), informal/media sources (“From a TV show/YouTube video”, “From a magazine/book about finances (e.g., financial self-help)”), self-generated (“I came up with the strategy on my own”), and no source (“I’ve never heard of this strategy”). Participants were able to describe where they heard about the strategy in an open-ended text box if none of the other sources of information were relevant. See Study B study materials.

## Results

### *Overall Strategy Familiarity and Use*

Participants were highly willing to use self-control strategies to help them stay on track when pursuing a financial goal ( $M = 6.25$ ,  $SD = 0.97$ ). In this study, 32.7% of participants ( $n = 70$ ) said that they had previously heard of all 13 self-control strategies. On average, participants reported hearing about 11.62 ( $SD = 1.53$ ) of the 13 strategies. Averaging across the 13 self-control strategies, participants reported that they were familiar with the strategies ( $M = 5.33$ ,  $SD = 1.01$ ), used the strategies somewhat often in the past ( $M = 4.11$ ,  $SD = 1.03$ ), and anticipated moderate strategy use in the future ( $M = 4.66$ ,  $SD = 1.01$ ). The more familiar participants were with the strategies, the more often they used them in the past ( $r(214) = .71$ ,  $p < .001$ ) and the more often they anticipated using them in the future ( $r(214) = .61$ ,  $p < .001$ ). These results are consistent with the findings in Study A.

All participants ( $N = 214$ ) reported one or more sources of knowledge for each of the 13 self-control strategies they knew about, resulting in a total of 3003 indicators of hearing about a

strategy from a specific source. Across strategies, the most common source of knowledge were social sources (e.g., friend, family, colleague, blogger;  $n = 1632$ ), followed by informal/media sources (e.g., TV show, YouTube, magazine, book;  $n = 724$ ), self-generated (i.e., participant came up with strategy on their own;  $n = 716$ ), and official sources (e.g., government information campaign, bank/financial advisor, academic paper;  $n = 576$ ). See Table F2 for frequency counts by source of information.

**Table F2**

*Frequency of Sources of Information Across Strategies*

	Across 13 strategies <i>n</i> (%)	Across 6 proactive strategies <i>n</i> (%)	Across 7 reactive strategies <i>n</i> (%)	Comparing proactive and reactive strategies
<i>Social sources</i>				
From someone I know personally	1004 (33.4%)	478 (34.5%)	526 (32.5%)	$\chi^2 (1, N = 3003) = 1.29, p = .257$
From someone I don't know personally	628 (20.9%)	293 (21.1%)	335 (20.7%)	$\chi^2 (1, N = 3003) = 0.08, p = .777$
<i>Official sources</i>				
From a government information campaign	68 (2.3%)	39 (2.8%)	29 (1.8%)	$\chi^2 (1, N = 3003) = 3.51, p = .061$
From my bank or financial advisor	418 (13.9%)	321 (23.2%)	97 (6.0%)	$\chi^2 (1, N = 3003) = 183.44, p < .001$
From reading an academic paper	90 (3.0%)	46 (3.3%)	44 (2.7%)	$\chi^2 (1, N = 3003) = 0.92, p = .338$
<i>Informal/media sources</i>				
From a TV show, YouTube video	299 (10.0%)	142 (10.2%)	157 (9.7%)	$\chi^2 (1, N = 3003) = 0.24, p = .625$
From a magazine or book about finances	425 (14.2%)	228 (16.5%)	197 (12.2%)	$\chi^2 (1, N = 3003) = 11.19, p < .001$
<i>Self-generated</i>	716 (23.8%)	249 (18.0%)	467 (28.9%)	$\chi^2 (1, N = 3003) = 48.97, p < .001$
<i>Total (across all sources)</i>	3003	1386	1617	

*Note.* Cells show the frequency count by source and the percentage of the frequency out of the total across all sources for that column.

*Comparing Proactive Versus Reactive Strategies*

I compared proactive and reactive strategies for strategy familiarity and use. There was a significant difference between proactive and reactive strategies for familiarity and past use, but not for anticipated future use; see Table F3 for means. Participants were more familiar with the listed proactive strategies but used them less often in the past than the listed reactive strategies.

**Table F3***Familiarity and Use of Proactive and Reactive Strategies*

	Proactive <i>M (SE)</i>	Reactive <i>M (SE)</i>	Paired <i>t</i> -test
Strategy familiarity	5.44 (0.07)	5.23 (0.08)	$t(206) = 3.38, p = .001, d = 0.24$
Past use	4.00 (0.09)	4.22 (0.07)	$t(206) = 2.58, p = .011, d = 0.18$
Future use	4.67 (0.08)	4.64 (0.08)	$t(206) = 0.26, p = .793, d = 0.02$

Participants reported learning about proactive and reactive strategies from different sources (see Table F2). Participants reported hearing about proactive and reactive strategies similarly frequently from social and from informal/media sources. Self-generating strategies (i.e., “I came up with the strategy on my own”) was more common for reactive than proactive strategies. Participants heard from official sources about proactive strategies more than reactive strategies.

**Study A Survey**

Thank you for deciding to participate!

First, we would like to know a little about you.

Your age in years: *[text box]*

Please select the gender you identify with:

- Male
- Female
- Other

Your level of education?

- Some high school
- High school degree
- Some college
- College degree
- Postgraduate degree

Which best describes your total annual household income, before taxes?

- Under \$20,000
- \$20,000 – \$29,999
- \$30,000 – \$39,999
- \$40,000 – \$49,999
- \$50,000 – \$59,999
- \$60,000 – \$69,999
- \$70,000 – \$79,999
- \$80,000 – \$99,999
- \$100,000 – \$124,999
- \$125,000 – \$149,999
- \$150,000 or more
- Prefer not to say

**\* NEW PAGE \***

We are interested in the types of financial goals people have. Please describe a saving goal (e.g., an intention to save) or a spending goal (e.g., an intention to restrict or reduce spending) that you currently pursuing. It can be a long-term (e.g., saving for retirement) or a short-term goal (e.g., spending within a budget when grocery shopping). These goals can be recurrent, such as a monthly spending goal, or a one-time goal, such as saving to buy a new TV.

One of my financial goals is: *[text box]*

**\* NEW PAGE \***

Now, we're going to ask you about your own past spending and saving behaviour. When pursuing goals, we frequently use tricks or 'strategies' to help us stay on track. For example, someone on a diet may avoid the cookie aisle when grocery shopping. Strategies can also be used for saving/spending goals.

On the following pages you will see examples of strategies (13 strategies in total) people use to help them stay on track with their saving and spending goals. On each page you will see a list of strategies and you will be asked to rate whether you have used the strategy in the past, your beliefs about the effectiveness of the strategy, and whether you might use each strategy.

**\* NEW PAGE \***

Please recall a time when you used the following strategy to help you maintain your saving/spending goals. *[The following strategies will be presented one per page and participants will rate each strategy for each of the five items below.]*

1. Thinking about why you are pursuing your goal  
Some people think about the reasons why they are pursuing the goal. For example, you might think about why you are saving money (e.g., because of an upcoming vacation, because you want a comfortable retirement, because you want your children to go to college, etc.).
2. Making your goal specific  
When choosing their saving or spending goals, some people make the goal as specific as possible. For example, you might set a specific dollar amount for how much you want to spend, or you might set a specific deadline for yourself by which you want to achieve the goal (e.g., save \$100 by December).
3. Automatizing savings behaviour  
To help achieve saving/spending goals, some people prefer to automatize the process. For example, you might set up a direct deposit where a percentage of your paycheck automatically goes into a savings account.
4. Keeping your cash only in small bills or coins (rather than larger bills)  
Another strategy some people use to limit spending is to keep spending cash only in small bills and coins. For example, when withdrawing cash, you might request to receive the money in \$5 and \$1 bills as opposed to larger bills.
5. Separating expenses into categories and creating budgets for each category  
Some people separate expenses into categories and create budgets for each category. For example, you might have a separate budget for your food money, which you only use for grocery shopping.
6. Using only cash for spending  
Another strategy some people use is to use only cash for purchases. For example, instead of using credit cards, debit cards, cheques, etc., you might limit yourself to only spend the money you have with you in physical bills and coins.
7. Applying for a savings account with no early withdrawals  
Some people use strategies that limit their future behaviour when pursuing saving goals. For example, you might choose to deposit your savings in an account that limits when you can make withdrawals (e.g., after you retire) or places a penalty on early withdrawals.

8. Receiving notifications after each purchase  
Some people choose to receive notifications on their phone from their bank after each purchase they make. Such notifications state the total of the purchase they just made and the account balance of that card.
9. Using a retirement savings projection plan  
When thinking about long-term retirement savings, some people plan and calculate the necessary steps you will need to take to achieve your retirement saving goal. For example, you might have calculated how much you need to save per month to have your desired amount saved by your retirement.
10. Thinking about your future self when thinking about your goal  
Some people also imagine their future self when thinking about your goal. For example, you might picture what you would look like in 10 years and what kind of financial situation you would be in to make the future seem more real.
11. Imagining whether you would regret this purchase tomorrow  
To help reduce the number of impulsive purchases, some people think about whether they would regret this purchase tomorrow. For example, when tempted by the latest gadget or new clothing you might think about how you would feel about the item tomorrow and whether you would regret buying it today.
12. Remembering your account balance before making a purchase  
Some people choose to think about their current account balance before making a purchase. For example, before purchasing a new pair of shoes, you might look up what your current account balance is before making the purchase on a banking app.
13. Choosing to pay now rather than later  
Some people decide to only purchase items that they can afford to pay right now and avoid financing options (where they can pay later, over installments, or by putting the purchase on credit cards). For example, you might avoid any financing options in your own purchases and rather pay it off in full right away.

*[the following items were asked of each strategy.]*

Some people use this strategy to help them achieve their financial goals. Have you heard of this strategy before?

- Yes
- No

How often have you used this strategy in the past?

- 1 Never – 7 All the time

How effective do you think this strategy is in helping people achieve their financial goals?

- 1 Not at all effective – 7 Very Effective

How effective do you think this strategy is in helping you personally to achieve your financial goals?

- 1 Not at all effective – 7 Very Effective

How likely are you to use this strategy in the future?

1 Not at all likely – 7 Very likely

**\* NEW PAGE \***

Apart from the strategies mentioned in this survey, are there any other things you do to help you achieve your saving and spending goals?

*[text box]*

Overall, how willing are you to use any strategy when pursuing a financial goal (e.g., save more money, spend less money)?

1 Not at all willing – 7 Very willing

**\* NEW PAGE \***

Using the scale below, please indicate how much you agree or disagree with each of the following statements. There are no right or wrong answers. We are interested in your ideas.

1 Strongly agree – 7 Strongly disagree

1. Using these strategies to reduce temptation is the best way to achieve your goals.
2. Using willpower to resist temptation is the best way to achieve your goals.
3. Resisting temptations is better than avoiding or reducing temptations.
4. Tricking yourself into not giving in to temptation is the clever way to do it.
5. People should be able to resist temptation without resorting to strategies.
6. It's better to avoid having to use willpower when there's another way.
7. If someone uses these strategies it means they're weak-willed.
8. If someone uses these strategies it means they have trouble controlling their urges.
9. I don't need to use these strategies because my willpower alone is enough.
10. I don't need to use these strategies because I can resist temptations anyways.

**\*END OF SURVEY\***

**Study B Survey**

Thank you for deciding to participate!

First, we would like to know a little about you.

Your age in years: *[text box]*

Please select the gender you identify with:

- Male
- Female
- Other

Your level of education?

- Some high school
- High school degree
- Some college
- College degree
- Postgraduate degree

Which best describes your total annual household income, before taxes?

- Under \$20,000
- \$20,000 – \$29,999
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- \$50,000 – \$59,999
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- \$80,000 – \$99,999
- \$100,000 – \$124,999
- \$125,000 – \$149,999
- \$150,000 or more
- Prefer not to say

**\* NEW PAGE \***

We are interested in the types of financial goals people have. Please describe a saving goal (e.g., an intention to save) or a spending goal (e.g., an intention to restrict or reduce spending) that you currently pursuing. It can be a long-term (e.g., saving for retirement) or a short-term goal (e.g., spending within a budget when grocery shopping). These goals can be recurrent, such as a monthly spending goal, or a one-time goal, such as saving to buy a new TV.

One of my financial goals is: *[text box]*

**\* NEW PAGE \***

Now, we're going to ask you about your own past spending and saving behaviour. When pursuing goals, we frequently use tricks or 'strategies' to help us stay on track. For example, someone on a diet may avoid the cookie aisle when grocery shopping. Strategies can also be used for saving/spending goals.

On the following pages you will see examples of strategies (12 strategies in total) people use to help them stay on track with their saving and spending goals. On each page you will see a list of strategies and you will be asked to rate whether you have used the strategy in the past, your beliefs about the effectiveness of the strategy, and whether you might use each strategy.

Overall, how willing are you to use any strategy when pursuing a financial goal (e.g., save more money, spend less money)?

1 Not at all willing – 7 Very willing

**\* NEW PAGE \***

Please recall a time when you used the following strategy to help you maintain your saving/spending goals. *[The following strategies were presented one per page and participants rated each strategy for each of the four items below.]*

1. Thinking about why you are pursuing your goal  
Some people think about the reasons why they are pursuing the goal. For example, you might think about why you are saving money (e.g., because of an upcoming vacation, because you want a comfortable retirement, because you want your children to go to college, etc.).
2. Making your goal specific  
When choosing their saving or spending goals, some people make the goal as specific as possible. For example, you might set a specific dollar amount for how much you want to spend, or you might set a specific deadline for yourself by which you want to achieve the goal (e.g., save \$100 by December).
3. Automatizing savings behaviour  
To help achieve saving/spending goals, some people prefer to automatize the process. For example, you might set up a direct deposit where a percentage of your paycheck automatically goes into a savings account.
4. Separating expenses into categories and creating budgets for each category  
Some people separate expenses into categories and create budgets for each category. For example, you might have a separate budget for your food money, which you only use for grocery shopping.
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Another strategy some people use is to use only cash for purchases. For example, instead of using credit cards, debit cards, cheques, etc., you might limit yourself to only spend the money you have with you in physical bills and coins.
6. Applying for a savings account with no early withdrawals  
Some people use strategies that limit their future behaviour when pursuing saving goals. For example, you might choose to deposit your savings in an account that limits when you can make withdrawals (e.g., after you retire) or places a penalty on early withdrawals.

7. Receiving notifications after each purchase  
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When thinking about long-term retirement savings, some people plan and calculate the necessary steps you will need to take to achieve your retirement saving goal. For example, you might have calculated how much you need to save per month to have your desired amount saved by your retirement.
9. Thinking about your future self when thinking about your goal  
Some people also imagine their future self when thinking about your goal. For example, you might picture what you would look like in 10 years and what kind of financial situation you would be in to make the future seem more real.
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11. Remembering your account balance before making a purchase  
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12. Choosing to pay now rather than later  
Some people decide to only purchase items that they can afford to pay right now and avoid financing options (where they can pay later, over installments, or by putting the purchase on credit cards). For example, you might avoid any financing options in your own purchases and rather pay it off in full right away.

*[the following items were asked of each strategy.]*

1) Some people use this strategy to help them achieve their financial goals. How well do you know this strategy?

1 Never heard of it – 7 Know it very well

2) Where did you learn about this strategy? Check all that apply.

*[Social sources]*

From someone I know personally, e.g. a colleague / friend / family member

From someone I don't know personally (e.g., story by a Blogger)

*[Official sources]*

From a government information campaign

From my bank/financial advisor

From reading an academic paper

*[Informal sources/ Media]*

From a TV show/YouTube video

From a magazine / book about finances (e.g., financial self-help)

*[Internal/no sources]*

I came up with the strategy on my own

I've never heard of this strategy

Other *[text box]*

3) How often have you personally used this strategy in the past?

1 Never – 7 All the time

4) How likely are you to use this strategy in the future?

1 Not at all likely – 7 Very likely

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Thinking of the last 12 months, how well have you been keeping up with your financial commitments?

Having real financial problems and falling behind

Keeping up but it sometimes is a struggle

Keeping up without any problems

I don't know

Thinking of the last 12 months, were you ever behind two months in a row or more...

...in paying a bill? (Yes/No/ I don't know)

... in paying your rent or mortgage? (Yes/No/ I don't know)

... in making a credit card or loan payment? (Yes/No/ I don't know)

Do you have a household budget?

Yes

No

I don't know

How often do you stay within your budget?

Never

Rarely

Often

Always

I don't know

I don't have a budget

How often do you usually check the balances on any bank accounts you have? (approximately)

Yearly

Monthly

Every 2 weeks

Weekly

Daily

Are you planning ahead financially for when you get to retirement age? A plan could include many things like your own savings, government programs, pensions at work, family help, continuing to work, etc.

I don't know

Yes

No

I'm already retired

If you had a large, unexpected cost, for example equivalent to your take-home pay for at least 2 weeks, how would you mostly likely cover this expense?

I couldn't cover that kind of cost or Don't know

Go to a pawnbroker or payday lender

Borrow from a bank or use a credit card

Borrow from friends or family

Sell an asset or personal possession

Use savings

**\*END OF SURVEY\***