

# Compared to Dematerialized Money, Cash Increases Impatience in Intertemporal Choice

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When it comes to trading time for money (or vice versa), people tend to be impatient and myopic. Often dramatically so. For illustration, half of people would rather collect \$15 now than \$30 in 3 months. This willingness to forego 50% of the reward to skip a 3-month wait corresponds to an annual discount rate of 277%. This article investigates how money's physical form biases intertemporal choice. We ask, what happens to (im)patience (i.e., discount rates) when time is traded against cash rather than against an equivalent sum of dematerialized money? We find that intertemporal decisions pitting time against cash (rather than against dematerialized money) increase impatience. The underlying mechanism relates to the pain of parting from money. Letting go of cash (dematerialized money) we can have now is psychologically more (less) painful, which in turn reduces (increases) our willingness to wait for larger-later payoffs. Importantly, heightening prevention focus (i.e., concerns for safety and security) moderates this bias. The article concludes by discussing the implications of the research, particularly for the psychology of saving behavior.

**Keywords** Physical form of money; Intertemporal choice; Discounting; Financial decision-making; Psychology of money; Prevention focus; Behavioral economics

## Introduction

Would you prefer receiving \$1 now or \$1.50 tomorrow? *Intertemporal choice* can be broadly construed as choosing between a smaller reward coming sooner and a larger reward coming later. In essence, intertemporal choice hinges on our willingness to forego money (\$.50) in order to accelerate the reception of a payoff (by 1 day). Or conversely, it hinges on our willingness to wait (1 day) in order to receive a surplus (\$.50). The amount of money foregone (\$.50) to skip time (1 day) is commonly referred to as discount rate.

## Present Research

Money takes different forms and varies in tangibility. More tangible forms include bills and coins; less tangible forms include credit cards, Apple Pay, etc. This manuscript investigates whether, when, and why money's physicality influences intertemporal choice.

Our first proposition is that cash makes consumers impatient. Referring to the illustration at the onset, we predict consumers are more likely to favor smaller-sooner rewards (\$1) over larger-later ones (\$1.50) when these rewards are in cash. When said rewards are framed in dematerialized money, consumers should become more patient (i.e., more likely to wait for the larger-later payoff (\$1.50)). Second, we posit that a personality trait, prevention focus, may help protect against the biasing effect of cash on intertemporal choice. Third and last, we submit that the psychological pain associated with parting from money is the force behind the aforementioned asymmetry.

## Real-World Relevance

With the digitization of the economy, consumers transact electronically more often (i.e., in dematerialized money). Yet, the use of cash in daily life

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remains more common than one might think. Contributing to the practice is the very means by which people are paid. In the US, 10%–20% of workers collect part (if not all) of their wages in cash (e.g., cooks, waiters, cleaners, sitters, tutors, maintenance/repair crews). In India, only 8% of the population use accounts at financial institutions to receive wages (Korenke, Joseph, & Mazzotta, 2013). Globally, 1.8 billion workers (i.e., >50% of the labor force) are paid in cash (OECD, 2009).

Given the magnitude of people navigating life primarily with cash, this paper examines whether, when, and why money's physicality influences intertemporal financial-decisions (e.g., foregoing money in the present to reap financial benefit later (e.g., interest)). Said differently, we investigate how the form of money shapes tradeoffs between smaller-sooner and larger-later payoffs. These questions bear importance for the unbanked/underbanked in advanced economies and much of the developing world.

Next, we briefly review the extant research on the physicality of money before deriving our own theorizing and predictions.

### Conceptual Development

#### *Cash Breeds Impatience (Main Effect)*

Studies found that paying in cash (vs. dematerialized money) reduces the amount spent on a given product and even the very likelihood of purchase altogether (Feinberg, 1986; Raghuram & Srivastava, 2008; Shah, Bettman, & Payne, 2015). Similarly, using cash at an auction halves the amount offered for a given object (compared to bidders using credit cards; Prelec & Simester, 2001). These findings derive from the psychological pain of paying. Even when price tags are held constant, paying in cash is more painful than paying with dematerialized money, which in turn helps consumers spend/shop less.

While we agree that paying in cash is effective at curbing spending/shopping, we argue cash is not almighty. Revisiting the "pain of paying" literature through the lens of intertemporal choice, we posit cash may sometimes backfire (compared to dematerialized money) and hinder financial welfare. Indeed, considering tradeoffs between smaller-sooner and larger-later payoffs, we predict decisions framed in cash (dematerialized money) foster greater (lesser) impatience as captured by the likelihood to forego lucrative rewards.

We ground this proposition in the very literature that gave rise to the pain-of-paying paradigm. Specifically, we posit that foregoing money in the

present to reap financial rewards later (e.g., accrued interest) is more painful psychologically when the money to be given up is cash than when it is dematerialized. In turn, this asymmetrical pain causes asymmetrical impatience (i.e., a preference toward smaller-sooner rewards). Hence, while cash is consumers' friend in spending/shopping situations, we predict it will paradoxically turn against consumers in intertemporal decisions by reducing their willingness to wait for later, more lucrative rewards.

#### *Prevention Focus to Help Reduce Impatience (Interaction)*

*Prevention focus* is a personality disposition highlighting concerns for safety, responsibility, and security (Higgins, 1997). We posit that heightening prevention focus should moderate the main effect of money's physicality on intertemporal choice. Specifically, we predict that activating concerns of safety, responsibility, and security may reduce impatience when smaller-sooner and larger-later payoffs are framed in cash. Our reasoning is as follows.

As alluded, money feels more real, proximal, palpable, visceral when it is in cash form. This, in turn, makes it more painful psychologically for cash users to spend money when they shop (Raghuram & Srivastava, 2008; Soman, 2001, 2003; Thaler, 1999). Bringing these findings to bear for intertemporal choice (i.e., for one's willingness to wait for larger-later rewards), we predict:

At baseline levels of prevention focus (i.e., when prevention focus is left untouched and parting from cash is naturally more painful than parting from an equivalent sum of dematerialized money), the greater (lesser) pain of parting from cash (dematerialized money) shall lead consumers to favor smaller-sooner (larger-later) payoffs. Said differently, at baseline-levels of prevention focus, consumers trading time against cash (dematerialized money) find it more (less) painful to part from money and will in turn be less (more) willing to wait for a larger-later reward.

As prevention focus increases, however, concerns for safety, security, and responsibility gain momentum (Crowe & Higgins, 1997; Higgins, 1998). Goal-pursuit research shows that activating a goal increases not only commitment but also implementation-intentions toward reaching said goal (Carver & Scheier, 1998; Covington, 2000; Gollwitzer, 1999; Van Osselaer & Janiszewski, 2012). Hence, since priming prevention focus increases concerns for financial safety and security (Davinson & Sillence, 2014; Spiegel, Grant-Pillow, & Higgins, 2004; Van

Noort, Kerkhof, & Fennis, 2008), it is logical to expect greater commitment toward ensuring a better financial situation. In our context of intertemporal choice, this means a lesser sensitivity to the pain associated with delaying a reward. Said differently, the prospect of earning larger-later benefits buffers against/reduces the pain of parting from cash now, which in turn nudges consumers toward waiting for larger-later payoffs.

We note, however, that prevention focus might operate on the pain of parting from money asymmetrically (i.e., reduce it primarily when time vs. money tradeoffs are framed *in cash*). Indeed, per prior research, *dematerialized* money feels more virtual, less palpable, less visceral, less real (Raghubir & Srivastava, 2008); this is the very reason why it is little painful to let go of it in the first place. Accordingly, we expect a floor effect whereby prevention focus should do little in further decreasing said pain when money is immaterial. Our conceptual model follows (Figure 1).

### Experiment 1: Impact of Money's Physical Form on Intertemporal Choice

#### Participants, Design, and Procedure

Sixty-four staff and students from the University of Western Ontario were randomly assigned to one of two conditions (cash vs. dematerialized money; Table 1).

To frame intertemporal decisions in cash terms, half of participants completed a filler task (i.e., word puzzles) before receiving their pay, a \$5 bill. To frame intertemporal decisions in terms of dematerialized money, counterparts completed the very same filler before being credited \$5 on their university card (university cards function just like debit cards; they can be used in canteens, gas stations, bookstores, convenience stores, pharmacies, restaurants, etc. on and around campus).

While processing their payment, we offered all participants the following deal: either (a) walk away with their \$5 immediately, or (b) walk away with nothing but collect instead \$7 a week later. Answers were collected on a bipolar 4-point scale with no midpoint (Methodological Details Appendix [MDA] S1). In essence, we turned our lab into a financial institution. Leaving money with us for a week guaranteed an incremental gain of \$2, thereby allowing us to assess participants' patience (i.e., willingness to wait for the larger-later payoff).

Subjects indicated their relative preference between the two options and were paid accordingly (i.e., either \$5 immediately or \$7 a week later). To uphold appearances, cash participants collected their money in cash; card participants on their university card. This was true whether participants opted for the smaller-sooner or the larger-later payoff. Lastly, *everyone* (whether paid in cash or via card) who opted for the larger-later reward had to come back to our lab a week later to collect their \$7; this was meant to equate across conditions the cost/inconvenience of waiting.

#### Results and Discussion

As predicted, a main effect of money format emerged. Only 49% of participants in the cash condition opted for the larger-later payoff whereas 78% of counterparts in the card condition did so ( $\chi^2(1) = 5.444, p = .020$ ). Hence, nuancing the take-aways of prior research hailing cash as a prime avenue to secure one's financial future, our results suggest that cash is not almighty. When it comes to intertemporal choice (rather than spending/shopping behavior), we find cash can sometimes backfire (compared to dematerialized money) and lead consumers to forego lucrative financial opportunities. For perspective, delaying money-collection by 1 week in exchange of a \$2 surplus (over a \$5 principal) corresponds to an interest rate >2,000% per year.

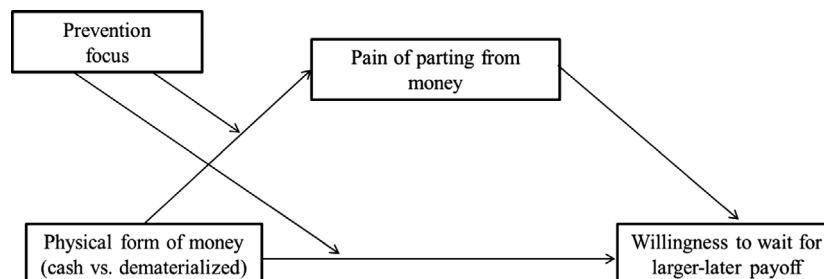


Figure 1. Conceptual model.

Table 1  
 Sample Characteristics, Means<sup>1</sup>, SDs, and Cell Sizes (Studies 1–3).

	Sample	Age range	Average age	Female/Male	Prevention focus	DV	Money-format	Mean	SD	N
Study 1	64	18–39	21.7	70/30	N/A	Willingness to wait for larger-later payoff	Cash	49% <sup>a</sup>	N/A	37
							Dematerialized	78% <sup>b</sup>	N/A	27
Study 2	313	18–61	20.1	58/42	Baseline		Cash	2.23 <sup>a</sup>	1.01	85
							Dematerialized	2.92 <sup>b</sup>	1.17	78
					High		Cash	2.46 <sup>ab</sup>	1.14	79
							Dematerialized	2.58 <sup>ba</sup>	1.16	71
Study 3	193	18–33	20.0	58/42	Baseline		Cash	2.22 <sup>a</sup>	1.17	46
							Dematerialized	2.92 <sup>b</sup>	1.14	50
					High		Cash	2.65 <sup>ab</sup>	1.07	43
							Dematerialized	2.70 <sup>ba</sup>	1.11	54

<sup>1</sup>Means sharing the same superscript are not significantly different from one another ( $p > .05$ ).

### Experiment 2: Prevention Focus as Moderator

Study 2 examines whether heightening prevention focus helps reduce the gap observed in study 1. A secondary goal is to examine potential explanations for said effect. Specifically, we consider whether tradeoffs/decisions made with cash in mind (rather than dematerialized money) foster different levels of affect or self-esteem, which might in turn drive our findings.

Of note, though prevention focus is a relatively stable personality-trait, Aaker & Lee (2001) show it can be manipulated situationally. We therefore opted for an experimental induction to promote internal validity (i.e., to reduce the likelihood of lurking variables confounding our findings).

#### Participants and Design

Recruited again for \$5 (to be paid in cash or through respondents' university card), 313 staff and students were randomly assigned to one of four conditions following a 2(Prevention focus: baseline/high) by 2(Money format: cash/dematerialized) between-subjects design.

#### Procedure

Following Duclos, Wan, and Jiang (2013) and Mogilner, Aaker, and Pennington (2008), we asked participants in the high-prevention-focus condition to think of a product that helps prevent undesirable outcomes. In the baseline (i.e., control) condition of prevention focus, participants were to think of what they ate and drank in the last 3 days.

Next, all participants completed the same filler task and a series of manipulation checks.

Prevention focus was assessed via Lockwood et al.'s 9-item scale (2002), a standard in self-regulatory research (MDA Appendix S1). For completeness, we also measured promotion focus via nine additional items (Lockwood, Jordan, & Kunda, 2002). Promotion focus yielded no significant results of any kind and is not discussed further.

Participants then completed 10 positive- and 10 negative-affect measures (Watson, Clark, & Tellegen, 1988) as well as 10 self-esteem measures (Rosenberg, 1965).

As in study 1, the experiment concluded by asking participants to indicate their relative preference between (a) receiving \$5 now or (b) waiting a week to receive \$7 instead. Once again, all decisions were binding and consequential.

#### Results

**Manipulation check.** Answers to the nine prevention-focus items ( $\alpha = .84$ ) were averaged and submitted to a one-way ANOVA. As expected, participants in the high-prevention-focus condition reported higher scores than counterparts in the baseline condition ( $M_{\text{baseline}} = 4.05$  vs.  $M_{\text{high}} = 4.45$ ;  $F(1, 311) = 11.513$ ,  $p = .001$ ,  $\eta^2 = .036$ ).

**Willingness to wait for the larger-later payoff.** A main effect of money format emerged. On average, participants trading time for cash were less willing to wait than counterparts trading time for dematerialized money ( $M_{\text{cash}} = 2.33$  vs.  $M_{\text{dematerialized}} = 2.76$ ;  $F(1, 309) = 11.906$ ,  $p = .001$ ,  $\eta^2 = .037$ ). As predicted, however, this main effect was moderated by prevention focus (interaction term:  $F(1, 309) = 4.694$ ,  $p = .031$ ,  $\eta^2 = .015$ ). In the control condition (i.e., when subjects' prevention focus was at baseline),

trading time for cash (dematerialized money) led participants to wait less (more;  $M_{\text{cash}} = 2.23$  vs.  $M_{\text{dematerialized}} = 2.92$ ,  $p = .001$ ). This simple effect replicates study 1's findings. In contrast, when prevention focus was heightened, participants exhibited similar patience, whether paid with cash or dematerialized money ( $M_{\text{cash}} = 2.46$  vs.  $M_{\text{dematerialized}} = 2.58$ ; NS). No main effect of prevention focus emerged ( $F(1, 309) = .116$ ,  $p > .734$ ,  $\eta^2 = .000$ ).

#### *Affect and Self-Esteem as Explanations*

Two-way ANOVAs yielded no main effects and no interactions on either affect (whether positive or negative) or self-esteem (top of Appendix A). In and of themselves, these results suggest that affect and self-esteem are unable to account for our findings. We went a step further, however, and rerun the prevention-focus\*money-format ANOVA, this time with affect and self-esteem as covariates. Our earlier findings remained unchanged (bottom of Appendix A).

#### *Discussion*

Three conclusions may be drawn from study 2. First, by replicating the results of study 1, study 2 testifies to the robustness of our initial findings. Second, by documenting how prevention focus moderates the impact of money format on patience in intertemporal choice, study 2 unearths a personality-by-context interaction not identified by the literature so far. This finding holds value not only for theory but also for practice; we revisit this issue later. Third, intertemporal decisions made with cash in mind (vs. dematerialized money) do not seem to foster different levels of affect or self-esteem. Accordingly, the latter are unlikely to drive our findings.

### **Experiment 3: Pain of Parting from Money as Mechanism**

The primary purpose of study 3 is to shed light on the mechanism underlying our findings. For memory, because (a) securing larger-later rewards requires parting from money now, and (b) parting from cash is generally more painful psychologically than parting from dematerialized money, we predict that individuals making such tradeoffs with cash should be *less* patient than counterparts making said tradeoffs with dematerialized money. As noted earlier, however, heightening prevention

focus should reduce this asymmetry between cash and card users.

#### *Participants and Design*

Volunteers (193 university staff and students) were randomly assigned to one of four conditions following a 2(Prevention focus: baseline/high) by 2 (Money format: cash/dematerialized) between-subjects design (Table 1).

#### *Procedure*

The procedure resembled study 2's with a few modifications. Upon completing the same prevention-focus manipulation and manipulation-checks, participants indicated on a bipolar 4-point scale (with no midpoint) their relative preference between collecting \$3 now or \$5 a week later (MDA Appendix S1).

To examine whether the mechanism hypothesized earlier constitutes a viable explanation for our findings, four items measured the pain experienced by participants as they made their decision. Items read: "Parting from money I can have immediately (even in exchange for more money later) is *hard/difficult/painful/tricky* for me." Answers were collected on likert scales ranging from 1 (*not at all*) to 5 (*very*) and averaged into an index ( $\alpha = .92$ ).

Once again, choices were binding and consequential. And whether the tradeoff was made with cash or dematerialized money, *everyone* who opted for the larger-later payoff had to come back to the lab a week later to receive their due.

#### *Results*

*Manipulation check.* Answers to Lockwood et al.'s (2002) scale were again averaged ( $\alpha = .86$ ) and submitted to a one-way ANOVA. As expected, participants in the "high" condition reported greater prevention-focus inclinations than counterparts in the baseline condition ( $M_{\text{baseline}} = 4.29$  vs.  $M_{\text{high}} = 4.59$ ;  $F(1, 191) = 3.403$ ,  $p = .067$ ,  $\eta^2 = .018$ ).

*Willingness to wait for the larger-later payoff.* Once again, the physicality of money produced a main effect. On average, participants trading time for cash were less patient (i.e., less likely to wait) than counterparts trading time for dematerialized money ( $M_{\text{cash}} = 2.43$  vs.  $M_{\text{dematerialized}} = 2.81$ ;  $F(1, 189) = 5.410$ ,  $p = .021$ ,  $\eta^2 = .028$ ). As expected, however, this main effect was moderated by our prevention-focus manipulation (interaction term:  $F(1, 189) = 4.009$ ,  $p = .047$ ,  $\eta^2 = .021$ ). At baseline levels

of prevention focus, trading time for cash (dematerialized money) led participants to wait less (more;  $M_{\text{cash}}=2.22$  vs.  $M_{\text{dematerialized}}=2.92$ ,  $p = .003$ ; Figure 2). This simple effect replicates study 1's findings. In contrast, when prevention focus was heightened, willingness to wait remained equivalent regardless of money's form ( $M_{\text{cash}} = 2.65$  vs.  $M_{\text{dematerialized}} = 2.70$ , NS). Prevention focus had no main effect ( $F(1, 189) = .449$ ,  $p > .504$ ,  $\eta^2 = .002$ ). This replicates study 2's findings.

### Mechanism

Our theorizing predicted a moderated-mediation relationship wherein prevention focus moderates the effect of money format (IV) on the pain of parting from money (mediator), which in turn influences willingness to wait for the larger-later payoff (DV; Table 2). Confirming our predictions, the indirect effect (money format  $\rightarrow$  pain of parting from money  $\rightarrow$  willingness to wait) held at baseline levels of prevention focus. Parting from cash was more painful psychologically than parting from dematerialized money, which in turn caused subjects to forego a lucrative premium. In contrast, the indirect effect was mitigated at high levels of prevention focus. Here, money's physicality no longer affected the pain associated with parting from money; hence it did not subsequently sway willingness to wait (Appendix B). These results provide first-hand evidence in support of our theorizing. For completeness, Appendix C reports the money-format\*prevention-focus interaction on the mediator; a pattern similar to that on DV emerges.

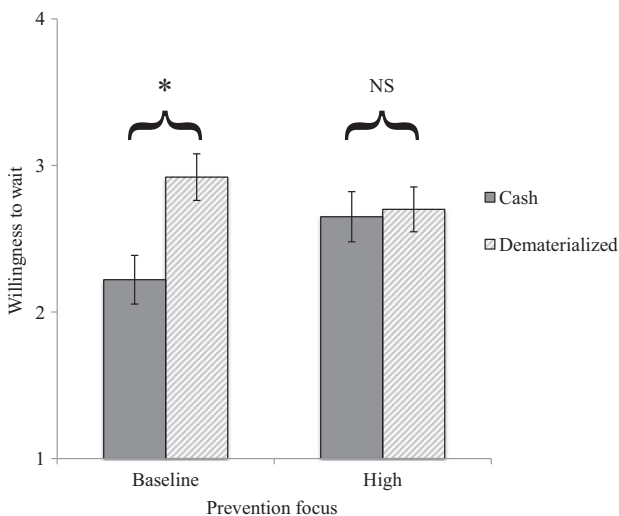


Figure 2. Willingness to wait for larger-later payoff (study 3).

### Discussion

The primary goal of study 3 was to shed light on the mechanism driving our results. The moderated-mediation results reported above are supportive of our theorizing. As predicted, parting from cash is psychologically more painful than parting from dematerialized money. This, in turn, causes participants trading time for cash to forego a substantial payoff. However, study 3 also finds that heightening people's concerns for safety, responsibility, and/or security (i.e., increasing prevention focus) reduces the gap created by money's physicality on willingness to wait.

### General Discussion

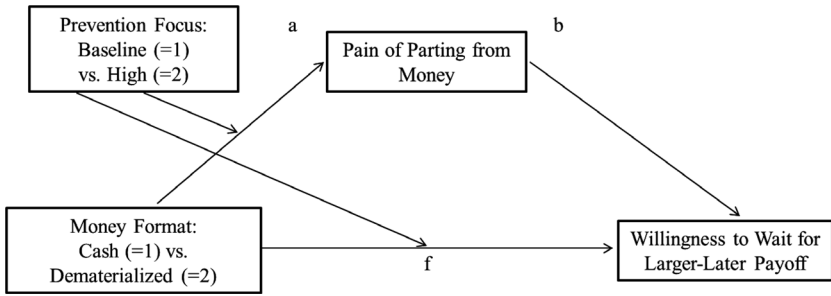
We set out to investigate the impact of money's physical form on intertemporal choice and found that individuals trading time for cash are more likely to forego a premium than counterparts trading time for dematerialized money (study 1). Study 2 found that prevention focus moderates this asymmetry (i.e., when prevention focus is heightened, consumers exhibit similar patience, whether they trade time for cash or for dematerialized money). Study 3 replicated this interaction while shedding light on its underlying driver. Namely, letting go of money now (even for a premium) is more painful psychologically when said money is cash than dematerialized.

Along the way, we also considered *construal level* (Trope & Liberman, 2010) as a competing explanation for our findings. For brevity, we refer the reader to the Methodological Appendix (MDA Appendix S2) wherein we provide evidence suggesting construal level constitutes an unlikely driver of our results.

### Theoretical Contributions

Disciplines as varied as psychology, economics, marketing, and finance aim to help people make better financial decisions. As noted earlier, research on the "pain of paying" proved useful for many consumers by showing that using cash helps curb spending. By considering the ramifications of money's physical forms for intertemporal choice (e.g., in decisions where money must be foregone now in exchange of financial benefit later), we provide new insights to the BDT literature. Indeed, by showing when and why cash (compared to dematerialized money) increases discount rates (i.e., the

Table 2  
Moderated-Mediation Results (Study 3).



The diagram illustrates a moderated-mediation model. It features three main nodes: 'Prevention Focus: Baseline (=1) vs. High (=2)', 'Pain of Parting from Money', and 'Willingness to Wait for Larger-Later Payoff'. There are also two boxes for moderators: 'Money Format: Cash (=1) vs. Dematerialized (=2)'. Path 'a' goes from Prevention Focus to Pain of Parting from Money. Path 'b' goes from Pain of Parting from Money to Willingness to Wait for Larger-Later Payoff. Path 'f' goes from Money Format to Willingness to Wait for Larger-Later Payoff. There are also direct paths from Prevention Focus to Willingness to Wait for Larger-Later Payoff.

DV	Baseline		High prevention-focus	
Willingness to wait for larger-later payoff	Path ab Indirect effect (SE) = 19 (.09); 95% CI = [0.02, 0.37]	(f) Direct effect = .92, $p < .05$	Path ab Indirect effect (SE) = -.05 (.08); 95% CI = [-0.23, 0.11]	(f) Direct effect = .92, $p < .05$

Note. Process macro (Model 8),  $n = 193$ ; bootstrapping (5,000 samples).

extent to which people are (un)willing to forego a premium to accelerate reception of money), our findings add to the psychology of payment, saving, and debt (Prelec & Loewenstein, 1998; Tam & Dholakia, 2011; Winterich & Nenkov, 2015).

Our second theoretical contribution lies in documenting who may be more/less likely to suffer from the biasing effects of money's physicality in intertemporal choice. While, on average, patience asymmetries arise when one trades time for cash (rather than for dematerialized money), we show such asymmetries are more (less) likely to manifest in individuals with lesser (greater) prevention focus. These findings unearth a situation-by-personality interaction never documented before in either the JDM or the regulatory-focus literatures. So doing, we shed light on a character trait with great potential to foster (or hinder) people's financial welfare.

Third and last, while the "pain of paying" account works well to predict behavior in *spending* situations, it falls short of doing so for situations where money must be foregone not for a purchase but for saving purposes. In such circumstances, we must surrender money but this money remains ours. Our conceptualization based on the "pain of parting from money" (rather than on "pain of paying") offers a coherent and parsimonious rationale capable to explain not only (a) why cash helps in spending situations, but also (b) why cash may paradoxically hurt in saving decisions. This insight is novel in that it nuances/refines the wisdom widely derived from the "pain of paying" paradigm (i.e., that cash helps "save" money).

### Societal and Managerial Implications

This article examined intertemporal choice as consumers' willingness to forego money (and consumption) in the present to reap financial benefit later (e.g., interest). As alluded, this willingness is the cornerstone of saving behavior. But what happens when the money to be given up for saving purposes is in cash form? After all, more than half of the world's workers receive their pay in cash (Organization for Economic Co-operation and Development, 2009). These people navigate life and make financial decisions primarily (if not exclusively) in cash. As our studies demonstrate, letting go of cash (even to accrue a premium later on) is psychologically more painful than letting go of an equivalent sum in dematerialized money. Accordingly, our results suggest that much of the world's workers may be at a chronic disadvantage when it comes to long-term saving.

Lack of savings is a rampant issue with dramatic consequences (Salisbury & Nenkov, 2016; Winterich & Nenkov, 2015). And this problem is bound to increase in future years since greater life-expectancy will retard end of life, period in which healthcare needs/costs skyrocket. From a societal standpoint, then, understanding the factors that increase/decrease consumer saving is essential (Bryan & Herschfield, 2013; Tam & Dholakia, 2011; Thaler & Benartzi, 2004). Our findings offer potential insights for better financial planning. These include: alerting citizens to the fact that operating on a cash basis may hinder saving proclivities; raising people's

concerns for safety, responsibility, and/or security; reducing the pain of parting from money (e.g., by giving financial incentives).

We note that citizens most likely to suffer from the problems raised in our research are in lower-income households (e.g., construction workers; staff in hotel, restaurant, and entertainment industries). Such occupations are indeed more likely to pay in cash than via dematerialized means. They also tend to be (a) physically demanding (which, in and of itself, prompts early retirement) and (b) less remunerative. It is therefore all the more urgent to work toward saving plans that support decent standards of living during one’s active years as well as during retirement (wherein income drops significantly).

*Limitations and Future Research*

The relatively-high cost of behavioral science often forces researchers to rely on hypothetical scenarios (e.g., If you had \$X at your disposal, how would you use it?). As a result, DVs often capture *attitudes/intent to act* rather than real, binding behaviors. Our experiments overcame this limitation by adopting consequential procedures and paying participants according to their decisions. Though this approach is expensive, future research may examine what happens when financial stakes

are raised further. For instance, while we paid up to \$7 for partaking in 10-minute experiments, how would participants respond to higher incentives (e.g., \$10, \$20, \$30)? Would a linear relationship emerge? Or would a quadratic-form relation prevail whereby willingness to wait for larger-later payoffs plateaus at a certain threshold? And if so, what is this threshold and how does it vary with prevention focus?

Our experiments examined intertemporal choice as one’s willingness to forego money in the present (\$5) in order to reap financial benefit later (a payoff of  $5 + 2 = \$7$ ). While such willingness to wait is a cornerstone of saving decisions, it does not capture the full richness of saving behavior (e.g., setting aside money, foregoing immediate consumption, anxiously monitoring a 401k, etc). Future research would thus do well to examine how money’s physicality interacts with prevention focus (and perhaps other personality traits such as anxiety, depression, conscientiousness, neuroticism, self-control, or financial literacy) on financial decision-making. To this effect, we reckon archival- and survey-data may prove useful. Per our theorizing, are people who get their salary wired electronically onto a bank account more likely to save/invest than counterparts (with comparable income) who manually receive/handle their salary in cash?

**Appendix A: Alternative Explanations (Study 2)**

	Main effect of prevention focus	Main effect of money-format	Interaction
<b>ANOVA results</b>			
DV = Positive affect (10 items; $\alpha = .89$ )	$F(1, 307) = .040, p > .841, \eta^2 = .000$	$F(1, 307) = .310, p > .578, \eta^2 = .001$	$F(1, 307) = .212, p > .646, \eta^2 = .001$
DV = Negative affect (10 items; $\alpha = .89$ )	$F(1, 307) = .147, p > .702, \eta^2 = .000$	$F(1, 307) = 2.257, p > .134, \eta^2 = .007$	$F(1, 307) = .634, p > .427, \eta^2 = .002$
DV = Self-esteem (10 items; $\alpha = .86$ )	$F(1, 307) = .236, p > .628, \eta^2 = .001$	$F(1, 307) = .002, p > .969, \eta^2 = .000$	$F(1, 307) = .362, p > .548, \eta^2 = .001$
<hr/>			
DV = Willingness to wait for larger-later payoff	Main effect of prevention focus	Main effect of money-format	Interaction
<hr/>			
ANCOVA results w/ positive- and negative-affect as covariates	$F(1, 305) = .285, p > .594, \eta^2 = .001$	$F(1, 305) = 9.563, p = .002, \eta^2 = .030$	$F(1, 305) = 4.342, p = .038, \eta^2 = .014$
w/ self-esteem as covariate	$F(1, 306) = .203, p > .653, \eta^2 = .001$	$F(1, 306) = 10.948, p = .001, \eta^2 = .035$	$F(1, 306) = 4.892, p = .028, \eta^2 = .016$



### Appendix B: Moderated-Mediation Results (Study 3)

To test our predictions, we used the PROCESS macro (Model 8, 5,000 bootstrapped resamples; Hayes, 2017) to construct 95% bias-corrected confidence intervals (CIs). The index of moderated mediation excluded zero ( $B = -.24$ ,  $SE = .13$ , 95% CI =  $-0.50$ ,  $-0.01$ ), thereby indicating a significant overall moderated-mediation effect (Zhao, Lynch, & Chen, 2010).

Breaking down its location, the indirect effect (money-format  $\rightarrow$  pain of parting from money  $\rightarrow$  willingness to wait) was significant and excluded zero at baseline levels of prevention focus ( $B = .19$ ,  $SE = .09$ , 95% CI =  $0.02$ ,  $0.37$ ), thereby replicating the results of studies 1 and 2. That is, parting from cash was more painful psychologically than parting from dematerialized money, which in turn caused subjects to forego a lucrative premium.

In contrast, the indirect effect was mitigated and non-significant at high levels of prevention focus ( $B = -.05$ ,  $SE = .08$ , 95% CI =  $-0.23$ ,  $0.11$ ). That is, in the high prevention-focus condition, money's physicality no longer affected the pain associated with parting from money; hence it did subsequently sway willingness to wait.

### Appendix C: Money-Format\*Prevention-Focus Interaction on the Mediator (Study 3)

Mirroring the effects on the dependent variable, prevention focus moderated the main effect of money's physical form on the mediator as follows (interaction term:  $F(1, 189) = 4.061$ ,  $p = .045$ ,  $\eta^2 = .021$ ). At baseline levels of prevention focus, trading time for cash (dematerialized money) led participants to report higher (lower) pain of parting from money ( $M_{\text{cash}} = 2.17$  vs.  $M_{\text{dematerialized}} = 1.75$ ,  $p = .027$ ). In contrast, when prevention focus was heightened, pain of parting from money remained equivalent regardless of money's form ( $M_{\text{cash}} = 1.90$  vs.  $M_{\text{dematerialized}} = 2.02$ ,  $p = .533$ ).

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### Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

**Appendix S1.** Key measures across studies 1–3).

**Appendix S2.** Construal level theory as an alternative explanation.

**Appendix S3.** Table 2 (revised) without the item “tricky” included in mediating scale.

**Appendix S4.** Results when the DV is re-analyzed as a binary choice.

**Appendix S5.** Additional analyses requested by AE.