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### Refund Psychology

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Refund Psychology

by

Tianjiao Yu

A dissertation presented to  
The Graduate School  
of Washington University in  
partial fulfillment of the  
requirements for the degree  
of Doctor of Philosophy

May 2022

St. Louis, Missouri

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Tianjiao Yu

*Washington University in St. Louis*

*May 2022*

## ABSTRACT OF THE DISSERTATION

Refund Psychology

by

Tianjiao Yu

Doctor of Philosophy in Business Administration

Washington University in St. Louis, 2022

Professor Cynthia Cryder, Co-Chair

Professor Robyn A. LeBoeuf, Co-Chair

Consumers frequently receive refunds from prior purchases. In this research, I examine if money refunded from previous purchases is more likely to be spent than money that does not go through a refund process. Across eight fully pre-registered studies, I test how consumers' willingness to spend depends on the transaction history of their money. I find that money refunded from a previous purchase is more likely to be spent on items unrelated to that purchase than non-refunded money that is otherwise identical in its source. I suggest that this pattern arises because the refunded money is earmarked as "spending money" at the time of the initial purchase and then retains that earmark even after the refund. Therefore, when refunds arrive, they feel free from obligations and easy to spend. This research documents the psychology of purchase refunds, a topic largely unaddressed in the mental accounting literature to date.



# Chapter 1: Conceptual Background

## 1.1 Introduction

Imagine that you recently ordered a \$40 sweater online, then decided upon receiving it that you do not need a new sweater after all. You then returned the sweater to the store for a refund. How would you feel about the \$40 that you receive from the refund? Would that \$40 be easier or harder to spend than other money, and why? In other words, how would the refund history of the money influence how you spend it?

Consumers frequently receive refunds from prior purchases. In 2021, for example, US consumers returned \$761 billion worth of merchandise (National Retail Federation 2021). The value of merchandise returned accounts for 16.6% of the total annual sales of the US retail industry. Despite the multi-billion-dollar size of the return and refund market, little is known about how consumers use the refunds after receiving the money. In this research, I examine how consumers treat money refunded from previous purchases.

Psychological research documents several interesting cases where the source of money dictates how consumers use it. For instance, people are more likely to buy a vacation with money that comes from a gift rather than from a work bonus (Henderson and Peterson 1992), and people are more likely to spend money prosocially when the money is earned via unethical rather than ethical means (Gneezy, Imas, and Madarasz 2014; Imas, Loewenstein, and Morewedge 2020). Indeed, people routinely demonstrate that they consider where money comes from before deciding how to use it (Hastings and Shapiro 2013; Kooreman 2000; Levav and McGraw 2009; Reinholz, Bartels, and Parker 2015; Shefrin and Thaler 1988).

In the current research, I focus on the case of refunds. Refunded money has a “past,” in that consumers previously spent the money and then received it back. After a refund, a consumer’s financial state is not objectively different from before the purchase: the consumer is neither richer nor poorer than before and has no new possessions. Nevertheless, I propose that consumers treat refunded money differently from money that has not passed through the same process.

One possibility regarding how consumers perceive refunds relates to the mental accounting phenomenon known as earmarking. Earmarking occurs when consumers informally allocate money to specific purposes, such as food and entertainment (Cheema and Soman 2006; Heath and Soll 1996), family savings needs (Soman and Cheema 2011; Sussman and O’Brien 2016), or even single purchases (Choe and Kan 2021; Gourville and Soman 1998; Prelec and Loewenstein 1998; Stille, Inman, and Wakefield 2010). In the case of refunds, the purchase money may be originally earmarked, or mentally assigned, as money to be spent. I propose that, if the money is returned in the form of a refund, the “spending money” earmark may be retained. The money may thus feel free from obligations, leading consumers to feel unconstrained in spending the refund on a new item, even one unrelated to the original purchase.

I test this proposition across eight studies. I first examine if money refunded from previous purchases is more likely to be spent than other types of money, such as standard income payments, windfalls, and tax refunds. I then investigate why consumers are more likely to spend refunded money<sup>1</sup>.

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<sup>1</sup> Parts of this dissertation were co-authored by the candidate and the candidate’s two co-chairs. The candidate served as lead author on this co-authored work.

## 1.2 The Mental Accounting of Refunds

How should refunds be treated? As I noted, when someone receives a refund, they receive their own money back, ending up financially where they started before the original purchase was made. Thus, one could argue that refunds should not be spent any more freely than any other equivalent sum of money in one's account. One could even argue that, given that refunds simply return a person to baseline, they should be spent less freely than other true gains or increases in wealth. That is, \$40 received from a refund does not add to a person's assets (compared to before the original purchase), but \$40 in income does increase assets, leading to a possible prescription that refunds should be spent even less often than income payments.

To understand general perceptions of how refunds should be treated, I surveyed 152 participants from Mturk in a pilot study. I asked participants how they think refunds ideally should be treated and spent. I found that 57.9% of participants believed that refunds should be spent just as freely as other types of money that they might receive, while 32.2% of participants believed that refunds should be less likely to be spent than other types of money. Only the rest, 9.9% of participants, believed that refunds should be spent more freely than other types of money.

Despite this common stance that refunds should not be spent at rates higher than other types of money, it is easy to relate to the idea of perceiving refunds as "free money" despite the fact that they are actually one's own money being returned. In a second pilot study, I surveyed another 150 Mturk workers and asked them if they have the experience of spending refunded money on something that they would not normally have bought. Indeed, when I described the phenomenon to participants, 42.7% of them said that they identified with it. They reported examples such as receiving a refund for a broken blender and then splurging on a coffee maker,

or, receiving a refund for concert tickets and then spending on a facial massage that they would not have bought otherwise. This suggests that, despite the general belief that refunds should not be treated as free spending money, they sometimes are.

The mental accounting literature can shed light on how and why refunds might be perceived as spending money. Mental accounting is a set of cognitive operations that individuals and households use to evaluate and categorize their financial transactions (Henderson and Peterson 1992; Thaler 1985, 1999; Zhang and Sussman 2017). Mental accounting allows consumers to create meaningful classifications of their income and expenditures, transforming otherwise intractable questions (e.g., can I spend \$35 on shoes considering all of my current expenditures and potential for future income?), into manageable decisions (e.g., can I spend \$35 on shoes considering my spending budget for this month?).

Of particular relevance to the current paper is the notion that mental accounting allows people to assign income and expenditures to particular mental accounts (Heath and Soll 1996; Thaler 1999). The process of assigning portions of income to separate mental accounts (e.g., setting monthly budgets for clothing, or for general spending, or for retirement savings) is often referred to as earmarking (Heath and Soll 1996). Consumers create earmarks and often attempt to adhere to those earmarks, sometimes even in cases where doing so is not in consumers' best interests (Heath and Soll 1996; Pomerance et al. 2019; Sussman and O'Brien 2016).

Earmarking, and the resulting psychological commitment it entails, has the potential to matter for refund psychology. Consider a consumer receiving \$20 from returning a T-shirt. To proceed with the transaction process, the \$20 may be first counted as "spending money." I propose that, after the purchase is returned and the refund received, the money might retain that

earmark. That is, it may still be categorized as “spending money,” making it feel free from other financial obligations and available for spending opportunities.

In contrast, consider people’s perceptions of standard income payments that have not gone through a refund process. Different from refunded money, income payments are frequently linked to numerous pre-determined obligations. Consumers have a strong preference for depositing weekly paychecks into an account that is set up for daily living expenses (Henderson and Peterson 1992). Recent national surveys showed that a large proportion of wages and salaries are allocated towards regular expenditures, such as housing, transportation, and food (U.S. Bureau of Labor Statistics 2020). When income payments are not allocated towards spending, they are often used for other pre-planned purposes, such as saving (U.S. Bureau of Economic Analysis 2021). Thus, whereas refunded money may feel generally free from financial obligations, income payments that have not gone through a refund process may feel much less so, leading to the possibility that, although income payments increase a person’s assets in a way that refunds do not, refunds may be more likely to be spent on a given discretionary purchase.

This leads me to my main hypotheses:

H1: Money refunded from previous purchases is more likely to be spent on a discretionary purchase, compared to standard income payments that do not have the same transaction history.

H2: This increased spending of refunded money, compared to standard income payments, is driven, and mediated, by people’s perception that refunds are freer from obligations than are income payments that have not gone through a refund process.

I also test conceptually relevant boundary conditions for this refund effect. I hypothesize that refunded money feels free from financial obligations because it retains the “spending money” earmark. Therefore, I hypothesize:

H3a: When money is in a form that conveys it is spending money (e.g., on a gift card), even payments will seem spendable, and the effect of a refund on spending will be smaller.

H3b: When money is deposited into a location that conveys it is already obligated (e.g., into a savings account), even refunds will seem constrained, and the effect of a refund on spending will be smaller.

Although I predict that people will spend refunds more than non-refunded money, this research is largely agnostic about whether this represents an “error” on the part of consumers. One could argue that perhaps it is appropriate (or at least, not inappropriate) to continue to spend money that was once categorized as “spending money.” This research is not opposed to this position. At the same time, I also note that, in the first pilot study described above, only 9.9% of participants explicitly endorsed the idea that refunds “should” be spent more freely than other types of money, so it seems that many participants do not wish to treat receiving a refund as a reason to spend more. In any case, the purpose of this paper is to understand how and why people spend refunds, not to make a strong normative claim that people should or should not do so.

### **1.3 Purchase Refunds versus Windfalls and Tax Refunds**

It is also worth considering how purchase refunds, which I focus on, are perceived as different from versus similar to windfalls and tax refunds. In a variety of published accounts, unexpected, or “windfall” gains stimulate spending (Agarwal and Qian 2014; Bodkin 1959; O’Curry and Strahilevitz 2001; Shefrin and Thaler 1988). In one classic paper, for example,

undergraduate participants gambled more money after receiving an unexpected payment relative to an expected payment in the lab; in a separate experiment, participants spent more money at a basketball game after receiving unexpected relative to expected payments (Arkes et al. 1994). Consumers also spend more money after receiving unexpected discounts (versus no discounts) when purchasing groceries (Heilman, Nakamoto, and Rao 2002; Hodge and Mason 1995; Milkman and Beshears 2009) and when purchasing restaurant meals (Abeler and Marklein 2017).

Thus, it is possible that refunds may resemble windfalls in the sense that both may stimulate spending, but a key question is whether refunds are spent because they feel like windfalls, or whether refunds are perceived in ways that are distinct from windfalls. A hallmark of windfalls is that they are unexpected or surprising (Arkes et al. 1994). Refunds may be less so. That is, although consumers do not make purchases expecting to get a refund, once they initiate the refund process, consumers generally know the amount of the refund and the estimated time of receiving it. Thus, windfalls and refunds may be perceived differently. One goal of this paper is therefore to compare refunds to windfalls to explore whether any enhanced tendency to spend refunds is driven by people perceiving refunds as windfall gains.

I will also explore whether purchase refunds are treated differently from tax refunds. On the one hand, tax refunds and purchase refunds both involve receiving one's own money back, and some research suggests that households increase consumption in the months after receiving a tax refund (Souleles 1999). On the other hand, research has also found that people often have plans for using their tax refunds and that large portions of tax refunds go towards savings and paying off debts (Grinstein-Weiss et al. 2017; Mendenhall et al. 2012; National Retail Federation 2022; Shapiro and Slemrod 2003). Thus, tax refunds may not be perceived as free from

obligations as purchase refunds are, and tax refunds may consequently be less likely to be spent on the discretionary purchases focused on here. Therefore, another goal of this paper is to compare purchase refunds to tax refunds, to show that the enhanced tendency to spend purchase refunds is driven by purchase refunds feeling free from obligations.



## Chapter 2: Experimental Studies

I test my ideas in eight experiments. Studies 1a through 1c test how refunds are perceived and spent relative to income payments (studies 1a and 1b) and windfalls (study 1c). Study 2 is an incentivized, real-behavior experiment comparing spending decisions following refunds versus payments.

The next four studies explore when and why refunded money is more likely to be spent. In studies 3a and 3b, I measure to what extent refunded money feels free from obligations compared to income payments or tax refunds, and I test how that feeling mediates the effect of transaction history on willingness to spend. Studies 4a and 4b provide additional evidence for the underlying process by manipulating the degree to which money feels free from obligations, and showing that when money feels freer from obligations, it is more likely to be spent.

Throughout the studies, I operationalize willingness to spend as the decision to make a discretionary purchase, and the product in the discretionary purchase is not a replacement of the product in the first purchase. For example, in some of my studies I ask participants whether they would use the money refunded from a shirt to buy a pair of headphones. In study 2, participants decide whether or not to spend refunded money on a real charitable donation.

I report all measures, conditions and data exclusion criteria for all studies as recommended by Simmons, Nelson, and Simonsohn (2012). For all studies, sample size was decided before data collection. All studies are fully preregistered. Study materials, including complete stimuli and data, can be found at [https://researchbox.org/658&PEER\\_REVIEW\\_passcode=SDXHZE](https://researchbox.org/658&PEER_REVIEW_passcode=SDXHZE).

### 2.1 Study 1a

I began by comparing refunded money with income payments. In study 1a, participants imagined receiving a refund or a payment, and then indicated whether or not they would spend

the money on a discretionary purchase. Across conditions, I controlled for where the money originally came from and ensured that the refund differed from the payment only by going through an extra spend-and-return process.

### ***Methods***

This study was pre-registered at <https://aspredicted.org/blind.php?x=r7qp9a>. I recruited 400 Prolific workers ( $M_{\text{age}} = 31.64$  years; 52.3% female) and randomly assigned them to either the refund or payment condition.

Participants in both conditions imagined that they regularly spend time completing studies on Prolific and that they recently earned \$20 by doing so. Participants in the refund condition were also told that they spent the money on a \$20 T-shirt, then returned the T-shirt and received a refund:

#### Payment condition

*Imagine that last week you earned \$20 on Prolific. You decided to cash out your earnings via PayPal. From there, the money was automatically deposited into your checking account.*

#### Refund condition

*Imagine that last week you earned \$20 on Prolific and bought a \$20 T-shirt from Amazon using the money that you earned. You found that you no longer needed the T-shirt after you received it. You returned the product and submitted a refund request online. Your refund was automatically deposited into your checking account.*

Therefore, both the refund and payment came from the same source (Prolific) and ended up in the same place (a checking account). The only difference was that the refund went through the extra step of being spent and then refunded. To strengthen the manipulation, I then presented

a screenshot of checking account activity (see Figure 1), showing that the money had been deposited from Prolific (payment condition) or from a refund (refund condition). Appendix 1 contains the full, exact stimuli.

Payment condition

**Checking Account Activity** Page 1 of 1 (1 total transaction)

| Date         | Description                         | Amount  |
|--------------|-------------------------------------|---------|
| May 27, 2021 | Payment from Prolific (113-5464576) | \$20.00 |

Refund condition

**Checking Account Activity** Page 1 of 1 (1 total transaction)

| Date         | Description                               | Amount  |
|--------------|---|---------|
| May 27, 2021 | Refund from Amazon Purchase (113-5464576) | \$20.00 |

Figure 1. Screenshots of checking account activity in study 1a

Participants then considered the following purchase situation:

*Now imagine that you are shopping at one of your favorite stores, and you notice that a pair of headphones is on sale for \$20 (regular price: \$29.95). You have been interested in getting some new headphones.*

*With the \$20 [refund / payment] you received that was deposited into your checking account, would you buy the headphones for \$20?*

The response options were, “Yes, I would buy the headphones” and “No, I would not buy the headphones”. Choice order was randomized.

Finally, participants answered an attention-check question (“In the scenario that you just read, what were you asked about? Buying headphones for \$20 / Buying headphones for \$100 / I

don't know.”). All participants passed the attention check and no data were excluded from analyses.

### ***Results and Discussion***

Participants in the refund condition were more likely to spend the money on the headphones (75.8%) than were those in the payment condition (65.5%,  $\chi^2(1) = 5.04, p = .025$ ). Therefore, study 1a provided supporting evidence for Hypothesis 1.

In study 1a, only participants in the refund condition made an initial purchase before receiving the refund, whereas those in the payment condition did not. Therefore, one potential alternative explanation for study 1a is that my materials suggest that those in the refund condition have more money to afford the first purchase and are wealthier than those in the payment condition. To address this alternative explanation and replicate findings from study 1a, I conducted study 1b.

### **2.2 Study 1b**

In study 1b, I again tested the basic refund effect. In this study, participants in both the refund and payment conditions made the same initial purchase so that no differential inference about wealth could be drawn across conditions at this stage. Then, participants in the payment condition also earned an additional payment, whereas participants in the refund condition merely received their own money back, making participants in the payment condition objectively wealthier than those in the refund condition, and therefore providing a conservative test of the refund effect.

### ***Methods***

This study was pre-registered at <https://aspredicted.org/blind.php?x=fw7p2w>. I recruited 399 Prolific workers ( $M_{\text{age}} = 31.79$  years; 49.9% female) and randomly assigned them to either the refund or payment condition.

In both conditions, participants imagined that they regularly spend time completing studies on Prolific. They were further asked to imagine that last week they earned \$20 from Prolific and spent the money on a \$20 phone case. Next, participants in the refund condition were told that they returned the phone case and received the \$20 refund this week. Participants in the payment condition were told that they kept the phone case, and earned \$20 by completing studies on Prolific this week. Appendix 2 contains the exact stimuli for this study.

Therefore, in this study, participants in both conditions bought a phone case using money that came from the same source (Prolific). Because only participants in the payment condition earned \$20 in the subsequent week, whereas no such information was presented in the refund condition, my materials could even signal that participants in the payment condition are wealthier since they have \$20 in addition to a newly-purchased phone case, whereas participants in the refund condition have only the \$20 that they received back as a refund.

On the next screen, participants in both conditions were told that the money was automatically deposited into their checking account. As in study 1a, I presented a screenshot of their checking account activity, showing that money had been deposited from a refund (refund condition) or from Prolific (payment condition).

Participants were then offered a chance to buy a pair of headphones that was on sale for \$20. Participants indicated whether or not they would buy the headphones with the money they received (“Yes, I would buy the headphones” / “No, I would not buy the headphones”, order randomized).

Finally, participants answered the same attention-check question from study 1a. All participants passed the attention check and no data were excluded from analyses.

### ***Results and Discussion***

Participants in the refund condition were more likely to spend the money on the headphones (80.0%) than were those in the payment condition (69.6%,  $\chi^2(1) = 5.75, p = .016$ ). This pattern of results emerged even though prior spending was held constant between conditions, reducing the possibility that any observed effects are due to differential inferences in perceived wealth across conditions.

### **2.3 Study 1c**

Study 1c further explored whether money refunded from a previous purchase is more likely to be spent than non-refunded money. In addition to standard income payments, I compared refunded money against another type of money that does not have the same transaction history: windfalls. Consistent with Hypothesis 1 and the results from studies 1a and 1b, I predicted that refunds again would be more likely to be spent than payments.

I did not have a clear a priori prediction regarding how spending for refunds and windfalls would differ; however, I was interested in the degree to which consumers perceive refunds to be psychologically similar to windfalls. Therefore, study 1c also explored people's perceptions of the money beyond willingness to spend. Specifically, I investigated whether refunds are perceived like windfall gains. Arkes et al. (1994) argued that two key features of windfalls are that they feel unexpected and unearned by effort. As such, I measured whether the money in each condition seemed unexpected, surprising, and earned by effort. I also measured to what extent the money seemed like a gain.

### ***Methods***

The study was pre-registered at <https://aspredicted.org/blind.php?x=tf8794>. Participants (602 Prolific workers;  $M_{\text{age}} = 41.54$  years; 47.5% female) were randomly assigned to the payment, refund, or windfall condition.

All participants imagined receiving \$20. In the payment condition, they imagined receiving \$20 in cash as payment for a part-time pet-sitting job. In the refund condition, participants imagined receiving \$20 in cash as a refund from returning a phone case. In the windfall condition, they imagined receiving \$20 in cash from a winning lottery ticket. Appendix 3 contains the exact stimuli.

Participants then imagined that they saw a \$20 shirt at their favorite clothing store. To measure willingness to spend, I asked participants whether they would buy the shirt (“Yes, I would buy the shirt” / “No, I would not buy the shirt”, choice order randomized).

To explore how the money was perceived, I next asked participants to what extent they expected to receive (refund and payment conditions) or win (windfall condition) the money, to what extent they felt surprised about receiving or winning the money, and to what extent they felt that the money was earned by effort (1 = “Not at all” to 7 = “Extremely”). Participants also indicated to what extent the money felt like a financial gain or loss (-3 = “Definitely feels like a financial loss”, 0 = “Feels like neither a gain or a loss”, and 3 = “Definitely feels like a financial gain”).

Finally, participants answered an attention-check question (“In the scenario that you just read, what were you asked about? Buying a shirt for \$20 / Buying a shirt for \$100 / I don’t know.”). All participants passed the attention check and no data were excluded from analyses.

### ***Results and Discussion***

*Willingness to spend.* As I predicted, participants in the refund condition were more likely to buy the shirt (50.3%) than were those in the payment condition (31.8%;  $\chi^2(1) = 14.31, p < .001$ ). Consistent with prior literature, willingness to spend was significantly higher in the windfall condition relative to the payment condition (49.5% vs. 31.8%,  $\chi^2(1) = 13.36, p < .001$ ). Willingness to spend was not reliably different between the refund and windfall conditions (50.3% vs. 49.5%,  $\chi^2(1) = 0.02, p = .880$ ).

*Perceptions of the money.* One-way ANOVAs revealed a significant effect of condition on each of the four follow-up ratings (see Table 1).

Table 1. Ratings for different types of money in study 1c

| Measurement | Refund<br><i>M(SD)</i> | Windfall<br><i>M(SD)</i> | Payment<br><i>M(SD)</i> | <i>F</i> | <i>p</i> |
|-------------|------------------------|--------------------------|-------------------------|----------|----------|
| Expected    | 5.96 (1.41)            | 1.89 (1.20)              | 5.23 (1.52)             | 484.19   | <.001    |
| Surprising  | 2.08 (1.46)            | 6.02 (1.07)              | 2.72 (1.63)             | 446.90   | <.001    |
| Effortful   | 2.87(1.75)             | 2.03 (1.36)              | 5.53 (1.30)             | 315.66   | <.001    |
| Gain/Loss   | 0.58 (0.92)            | 2.08 (0.96)              | 1.70 (1.16)             | 113.65   | <.001    |

Post-hoc comparisons using Bonferroni corrections revealed that refunded money felt more expected than both windfalls ( $p < .001$ ) and payments ( $p < .001$ ). Similarly, refunds felt less surprising than both windfalls ( $p < .001$ ) and payments ( $p < .001$ ). Refunds felt more effortful than windfalls ( $p < .001$ ), but less so than payments ( $p < .001$ ). Refunds also felt less like a financial gain than both windfalls ( $p < .001$ ) and payments ( $p < .001$ ).



Thus, refunds feel much more expected, much less surprising, and more effortful than do windfalls, and refunds are also less likely to be encoded as a gain than are windfalls. Although refunds and windfalls were not spent at different rates, refunds and windfalls were perceived quite differently.

Study 1c showed refunds are more likely to be spent than payments, even though refunds feel less like financial gains than payments. Thus, some possible explanations for why people spend refunds seem unlikely: it is not the case that refunded money feels like a surprising windfall or substantially like a gain that improves one's financial standing.

### ***Discussion for Studies 1a-1c***

Studies 1a-1c consistently found that refunds were more likely to be spent than income payments. These results emerged even though refunds came from the same source as payments (study 1a), did not signal more wealth than payments (study 1b), and felt less like financial gains than payments (study 1c). Study 1c also revealed that it is unlikely that people spend refunded money because it feels like a surprising windfall, or that people spend refunded money simply because it feels like a financial gain. Instead, study 1c shows that people are more likely to spend refunds than payments despite the fact that refunds feel *less* like a gain. I return to the key question of why refunds are spent so freely in studies 3 and 4, but first I replicate the refund effect in a context where real money is spent.

## **2.4 Study 2**

In studies 1a-1c, participants imagined receiving a refund (versus an income payment or a windfall) and considered making a hypothetical purchase. Study 2 moves beyond hypothetical spending decisions to investigate real, albeit low-stakes, spending decisions.

In study 2, I again held prior spending constant within the study. Specifically, all participants were endowed with a small sum of money. They then spent this money to play a game. After the game, they received the same amount of money, framed either as a refund or a payment. Participants could then spend the money on an actual charitable donation if they wished to do so.

### ***Methods***

This study was pre-registered at <https://aspredicted.org/blind.php?x=f9y4k6>. I recruited 806 Prolific workers and randomly assigned them to either the refund or payment condition.

Participants in both conditions received 10 cents from experimenters at the beginning. Then, they were asked to play a game. They were informed that the game costs 10 cents to play, but they could use the 10 cents that they were endowed with to pay for the game. Participants then chose whether to spend their 10 cents on either a “guess the number of jellybeans” game or a “word scramble” game. After choosing the game, participants learned that if they completed the game, they would receive 10 cents that they could keep. I manipulated how those 10 cents were framed, describing them as either “refunding to you the cost of the game” (refund condition), or as an “additional payment of 10 cents” for completing the game (payment condition). In both conditions, I clarified that the 10-cent refund or payment was distinct from participants’ base payment for the study.

Next, participants played the game, either viewing four different pictures of jellybeans and estimating the number, or completing four word-unscrambling tasks. After the game ended, participants in the refund condition received a refund of the 10 cents that they had spent to play the game (“Because you completed the game, we are giving you a refund of 10 cents. This 10-cent refund is real and you can receive it at the end of the study.”). Participants in the payment

condition received a payment of 10 cents (“Because you completed the game, we are giving you a payment of 10 cents. This 10-cent payment is real and you can receive it at the end of the study.”).

Participants then considered making a donation to a hunger-relief organization, Feeding America:

*You can choose whether or not to donate your 10-cent [refund / payment] to Feeding America. Feeding America is America's largest domestic hunger-relief organization. If you choose not to donate, you will keep your 10-cent [refund / payment].*

Participants indicated whether or not they would spend the money on the donation (“Yes, I would like to donate my 10-cent [refund / payment] to Feeding America” / “No, I would like to receive my 10-cent [refund / payment] at the end of this study”, order randomized). Appendix 4 contains the full text of the donation scenario.

Finally, participants answered an attention-check question by identifying the organization that they were asked to consider (“In the scenario that you just read, which organization were you asked to donate to? Oxfam America / Feeding America / American Red Cross”). As outlined in the pre-registration, I excluded 19 participants who failed the attention check, leaving 787 participants for analysis ( $M_{\text{age}} = 33.50$  years; 52.2% female).

After the study closed, all participants received \$0.35 as base payment for the study. Participants who chose to keep the 10 cents received that money as a bonus. Participants who chose to donate the 10 cents had a 10-cent donation made to Feeding America on their behalf.

### ***Results and Discussion***

Participants for whom the 10 cents had been framed as a refund were more likely to spend it (specifically in this case, donate it) than were participants for whom it was framed as a

payment (52.8% vs. 44.7%,  $\chi^2(1) = 5.19, p = .023$ ). Thus, study 2 replicates the refund effect from studies 1a-1c in a novel context, and with real sums of money. In addition to relying on decisions with actual money, study 2 also has the advantage of not having any potential differential signals of wealth across conditions.

Next, I consider why refunded money is more likely to be spent. I propose that money, when budgeted to be spent, receives a “spending money” designation. If that money is returned via a purchase refund, it may retain that “spending money” earmark and may consequently feel free from obligations. I suggest that this sense of being free from obligations explains why refunds are spent more often than other types of money. Studies 3a and 3b investigate this mechanism via mediation, while studies 4a and 4b rely on moderation.

## **2.5 Study 3a**

In study 3a, I again compared refunded money with income payments. As in study 1a, both the refund and payment came from the same original source, and only the refund went through the extra step of being spent and then returned.

Most critically, study 3a examined the proposed psychological mechanism. Participants first chose whether they would like to spend the money and then indicated to what extent the money felt free from financial obligations. Consistent with Hypothesis 2, I predicted that refunded money would feel freer from financial obligations than payments, and that this difference would mediate the effect of transaction history on willingness to spend.

Study 3a also again tested the alternative explanation of feeling wealthy. As discussed, it is possible that consumers in some of my studies are more likely to spend refunds because making the original purchase signals to participants in the refund condition that they are wealthier. Although study 1b cast doubt on this account (by showing that the refund effect

emerges even when participants in both conditions make the same original purchase), in study 3a, I tested this explanation by measuring how wealthy participants felt in the scenario. I expected that feeling free from obligations would better explain why refunded money is more likely to be spent than feeling wealthy would.

### ***Methods***

This study was pre-registered at <https://aspredicted.org/blind.php?x=v6qd4x>. I recruited 600 Prolific workers and randomly assigned them to either the refund or payment condition.

The main manipulation and materials were identical to study 1a. In both the refund and payment conditions, participants imagined that they regularly spend time completing studies on Prolific and that they recently had earned \$20 from Prolific. Participants in the refund condition were further told that they spent the money on a \$20 T-shirt, then returned the T-shirt and received a \$20 refund. All participants were then offered a chance to buy a pair of headphones that was on sale for \$20, and they indicated if they would like to buy the headphones with the money they received (“Yes, I would buy the headphones” / “No, I would not buy the headphones”, order randomized).

Next, I reminded participants of the scenario that they just read. Participants in the refund condition were reminded that they received \$20 as a refund, and the money was deposited into their checking account. Participants in the payment condition were reminded that they received \$20 as a payment that was deposited into their checking account. After this recap, participants answered questions about whether the money felt free from obligations, and how wealthy they felt in the scenario, in a counterbalanced order.

To measure whether the money felt free from obligations, I asked participants the following three questions in a randomized order: “To what extent would you feel like the money

is available to you for spending?”, “To what extent would you feel free to spend the money on anything you wanted?”, and “To what extent would the \$20 seem free from financial obligations?” (1 = “Not at all” to 7 = “Extremely”).

To measure how wealthy participants felt in the scenario, I asked the following three questions in a randomized order: “How wealthy would you feel in this scenario?”, “How affluent would you feel in this scenario?”, and “How financially well-off would you feel in this scenario?” (1 = “Not at all” to 7 = “Very much”).

Finally, participants answered an attention-check question (“In the scenario that you just read, what were you asked about? Buying headphones for \$20 / Buying headphones for \$100 / I don’t know.”). As outlined in the pre-registration, I excluded one participant who failed the attention check, leaving 599 participants for analysis ( $M_{\text{age}} = 33.02$  years; 53.9% female).

## ***Results***

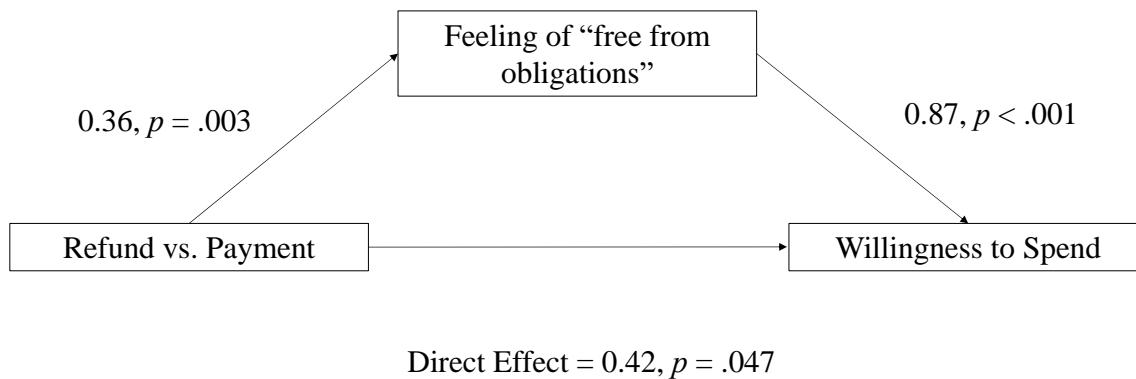
Participants in the refund condition were more likely to spend the money on the headphones (77.8%) than those in the payment condition (66.0%,  $\chi^2(1) = 10.37$ ,  $p = .001$ ). Thus, I replicated the general finding that refunds are more likely to be spent than payments.

Refunds also felt freer from obligations than payments. I averaged the three items measuring the feeling of being free from obligations into a composite score ( $\alpha = .85$ ), with higher numbers indicating greater freedom from obligations. On this composite, refunds felt freer (were rated higher) than payments ( $M_{\text{refund}} = 5.32$ ,  $SD_{\text{refund}} = 1.39$ ;  $M_{\text{payment}} = 4.95$ ,  $SD_{\text{payment}} = 1.54$ ;  $t(1, 597) = 3.03$ ,  $p = .003$ ).

Wealth perceptions were not reliably different between the refund and payment conditions. I averaged the three items measuring the feeling of being wealthy into a composite score ( $\alpha = .91$ ), with higher numbers indicating feeling wealthier in the scenario. On this

composite, participants felt similarly wealthy in the refund and payment conditions ( $M_{\text{refund}} = 3.14$ ,  $SD_{\text{refund}} = 1.42$ ;  $M_{\text{payment}} = 3.11$ ,  $SD_{\text{payment}} = 1.52$ ;  $t(1, 597) = 0.26$ ,  $p = .794$ ).

Next, I tested whether feeling free from obligations mediated the effect of transaction history on willingness to spend. I fit a mediation model using the PROCESS macro in SPSS. In this mediation model, the indirect effect of transaction history (refund vs. payment) on willingness to spend via feeling free from obligations was significant (0.32, 95% CI [0.11, 0.55]). The direct effect of transaction history on willingness to spend remained significant as well ( $b = 0.42$ ,  $p = .047$ ).



Indirect effect = 0.32, 95% CI [0.11, 0.55].

Figure 2. Mediation model in study 3a

To examine if wealth perceptions provide an alternative explanation for why refunded money is more frequently spent than payments, I tested a model with the feeling of being wealthy entered as a parallel mediator along with feeling free from obligations. Results showed that only the indirect effect of feeling free from obligations was significant (0.29, 95% CI [0.10, 0.50]), while the indirect effect of feeling wealthy was not significant (0.01, 95% CI [-0.06, 0.08]).

## **Discussion**

Study 3a replicated the finding that refunds are more likely to be spent than are equivalent income payments. Study 3a also shed light on the underlying psychological mechanism: refunds are more likely to feel free from obligations than are payments, and this difference mediates the difference in spending between refunds and payments. Study 3a further showed that the effect does not seem to arise because the refund scenario makes participants feel wealthier. An additional study used a similar study material as Study 3a and replicated the refund effect. This additional study further showed that refunds felt less like a financial gain than payments, and the feeling of financial gain (or lack thereof) did not mediate the difference in spending between refunds and payments. Appendix 5 contains the results for this additional study.

## **2.6 Study 3b**

Study 3a demonstrated that refunds feel freer from obligations than do payments, and that this difference mediates the difference in spending between refunds and payments. Study 3b extends these results while also comparing standard purchase refunds to tax refunds.

Although tax refunds and purchase refunds have some surface similarities, people often have plans for their tax refunds, with a substantial portion of tax refunds going towards planned savings or debt repayment (Grinstein-Weiss et al. 2017; Mendenhall et al. 2012; National Retail Federation 2022; Shapiro and Slemrod 2003). Thus, tax refunds may be earmarked and feel obligated in a way that purchase refunds may not be. Accordingly, I predicted that tax refunds would be less likely than standard purchase refunds to feel free from obligations, and would therefore be spent less often.

I tested this prediction in study 3b, comparing tax refunds to purchase refunds. As in study 3a, participants first chose whether they would like to spend the money and then indicated



to what extent the money felt free from financial obligations. I predicted that standard purchase refunds would feel freer from financial obligations than tax refunds, and that this difference would mediate the effect of transaction history on willingness to spend.

### ***Methods***

This study was pre-registered at <https://aspredicted.org/blind.php?x=it29a6>. I recruited 400 workers from Prolific and randomly assigned them to either the purchase-refund or tax-refund condition.

Participants in both conditions imagined that they regularly spend time completing studies on Prolific as well as working at other jobs. Then, participants in the purchase-refund condition were asked to imagine that their earnings balance on Prolific recently reached \$500, and they decided to cash out their earnings. They were further told that they first spent the \$500 to buy a new sofa set to replace an old one, then returned the new sofa and received a refund. In the tax-refund condition, participants were asked to imagine that they recently received \$500 as a tax refund. (Appendix 6 contains the exact stimuli.) Note that the amount of money in question (\$500) was higher in this study than in other studies; I made this change to make the amount more comparable to what a typical tax refund might be.

On the next screen, participants in both conditions were told that they received their purchase refund or tax refund in their bank account. I presented a screenshot of their bank account activity, showing that the money was either deposited as a purchase refund or a tax refund.

Participants then imagined that they had been considering buying an iPad and that they saw an iPad of the type that they wanted on sale for \$500. I asked them if they would buy the iPad using the \$500 refund (or tax refund) that was now in their bank account with response

options of “Yes, I would buy the iPad” or “No, I would not buy the iPad”, choice order randomized.

Next, I reminded participants of the scenario that they just read. Then, to measure whether the money felt free from obligations, I used the three-item composite from Study 3a, with the three questions presented in a randomized order.

Finally, I asked participants to what extent the money felt like a financial gain or a loss on the same scale used in study 1c. Participants also answered an attention-check question (“In the scenario that you just read, what were you asked about? Buying an Apple Watch for \$500 / Buying an iPad for \$500 / I don’t know.”). As planned in the pre-registration, I excluded two participants who failed the attention check, leaving 398 participants for analysis ( $M_{\text{age}} = 31.90$  years; 50.5% female).

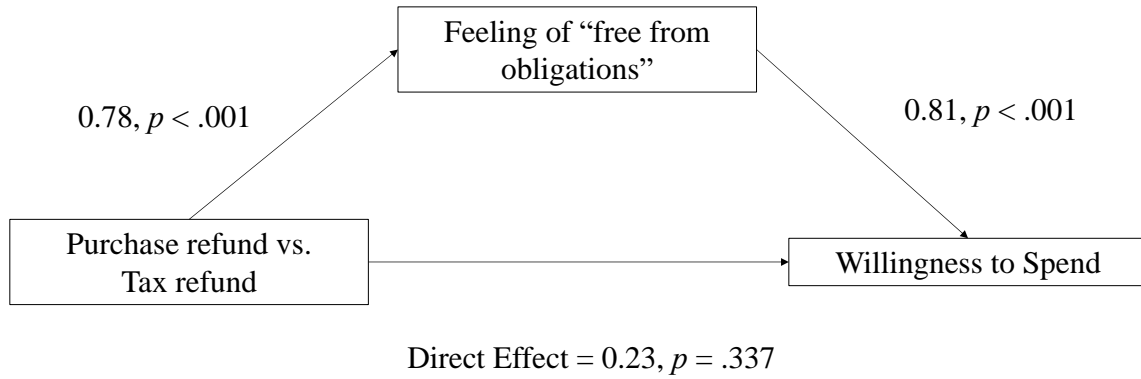
## **Results**

Participants who had received purchase refunds were significantly more likely to buy the iPad (50.3%) than those who had received tax refunds (34.6%,  $\chi^2(1) = 10.02$ ,  $p = .002$ ).

Purchase refunds also felt freer from obligations than tax refunds. As in study 3a, I averaged the three items measuring the feeling of being free from obligations into a composite score ( $\alpha = .87$ ), with higher numbers indicating a greater perception of being free from obligations. On this composite, purchase refunds felt freer (were rated higher) than tax refunds ( $M_{\text{purchase refund}} = 4.79$ ,  $SD_{\text{purchase refund}} = 1.60$ ;  $M_{\text{tax refund}} = 4.01$ ,  $SD_{\text{tax refund}} = 1.68$ ;  $t(1, 396) = 4.70$ ,  $p < .001$ ). Purchase refunds also felt less like a financial gain than tax refunds ( $M_{\text{purchase refund}} = 0.90$ ,  $SD_{\text{purchase refund}} = 1.17$ ;  $M_{\text{tax refund}} = 1.75$ ,  $SD_{\text{tax refund}} = 1.68$ ;  $t(1, 396) = 7.05$ ,  $p < .001$ ).

Next, I tested whether the sense of feeling free from obligations mediated the effect of transaction history on willingness to spend. I fit a mediation model using the PROCESS macro in

SPSS. In this mediation model, the indirect effect of transaction history on willingness to spend via feeling free from obligations was significant (0.63, 95% CI [0.36, 0.95]), while the direct effect of transaction history on willingness to spend was not significant ( $b = 0.23, p = .377$ ).



Indirect effect = 0.63, 95% CI [0.36, 0.95].

Figure 3. Mediation model in study 3b

### ***Discussion***

Study 3b showed that people are significantly more likely to spend standard purchase refunds than tax refunds. This pattern emerged even though standard purchase refunds feel less like a gain than tax refunds do, and even though the amount of money under consideration is substantially greater than the amount used in previous studies. Purchase refunds feel freer from obligations than do tax refunds, and this difference mediates the difference in spending between refunds and payments. Thus, studies 3a and 3b together provide mediational evidence for the underlying psychological mechanism of the refund effect.

### **2.7 Studies 4a and 4b**

Studies 4a and 4b turn to moderation techniques to complement the mediation approach from studies 3a and 3b to test the psychological process underlying the refund effect. As noted, I contend that refunded money is more likely to be spent because after being spent once, it retains

a spending money earmark and feels free from financial obligations. That is, when consumers return a product and receive the money they have previously spent, the money is no longer tethered to the previous usage and feels free for other uses.

If my theorizing is correct, then when payments are given in a format suggesting that they are intended for spending and are otherwise free from obligations (e.g., given on a gift card), then payments might be more likely to be spent. Conversely, when refunded money is deposited into an account that indicates a savings earmark (e.g., deposited into a savings account earmarked for retirement), refunds may no longer feel free from obligations and may be less likely to be spent (Sussman and O'Brien 2016).

In study 4a, I compared participants' tendency to spend refunds versus payments, manipulating whether the money was deposited into a checking account or onto a gift card. I predicted that the refund-payment difference would be attenuated when the money was on a gift card, as even payments might seem relatively free from obligations in that case. In study 4b, I used a similar design, manipulating where the money was deposited. I expected the refund-payment difference to be smaller when the money was deposited into an account earmarked for retirement savings compared to when the money was deposited into a checking account, as even refunds in an earmarked savings account may not seem free from obligations.

### **2.7.1 Study 4a**

In study 4a, I compared refunds to payments and manipulated whether the money was deposited into a checking account or onto a gift card.

Past research has found that people intend to spend more money after receiving money on a gift card than after receiving an equivalent amount of gifted cash that is later deposited into a checking account (White 2006). Inspired by this work, I hypothesized that money deposited onto

a gift card feels freer from obligations than money deposited into a checking account. I tested this conjecture in a between-subjects pretest in which participants ( $N = 193$ , from Mturk) were asked to imagine that they earned \$20 by completing HITs on Mturk. They were told that the money was automatically converted to an Amazon gift card or automatically deposited into their checking account, and then they answered two questions about how free from obligations the money felt (“To what extent would you feel free to spend the money on anything you wanted?” and “To what extent would the \$20 seem free from financial obligations?”, 1 = “Not at all” to 7 = “Extremely”). A composite of these two items ( $\alpha = .81$ ) showed that money deposited onto a gift card felt freer from obligations than money deposited into a checking account ( $M_{\text{gift card}} = 5.19$ ,  $SD_{\text{gift card}} = 1.39$ ;  $M_{\text{checking account}} = 4.19$ ,  $SD_{\text{checking account}} = 1.92$ ;  $t(1, 191) = 4.19$ ,  $p < .001$ ).

Based on this pretest, I predicted that income payments would be more likely than usual to be spent when they are on a gift card because they will seem freer from obligations. At the same time, I predicted that willingness to spend refunded money would be relatively less influenced by the location of deposit, because refunds already feel free from obligations. In other words, I expected to attenuate the refund-payment difference when the money was on a gift card.

## ***Methods***

The study was pre-registered at <https://aspredicted.org/blind.php?x=8786fk>. I recruited 1003 Mturk workers.

The study used a 2 (transaction history of money: refund versus payment) by 2 (location of deposit: checking account versus gift card) fully between-subjects design. All participants were first asked to imagine that every week they spend time completing HITs on Mturk. Participants in the payment condition imagined that last week they earned \$20. Participants in the refund condition also imagined that last week they earned \$20 and that they then used the

money to buy a \$20 T-shirt from Amazon. They were further told that they returned the T-shirt and submitted a refund request.

Next, I manipulated the location of deposit. Participants in the checking-account condition were told that their payment or refund was automatically deposited into their checking account. Participants in the gift-card condition were told that their payment or refund was automatically converted to an Amazon gift card. On the same screen, I presented screenshots that matched the scenario that participants just read.

Participants were then offered a chance to buy a pair of headphones that was on sale for \$20. Participants indicated whether or not they would buy the headphones with the money they received (“Yes, I would buy the headphones” / “No, I would not buy the headphones”, choice order randomized).

Finally, participants answered an attention-check question that asked them what they were asked to imagine in the scenario: spending money from their checking account, spending money from a gift card, or spending cash. As planned in the pre-registration, I excluded 46 participants who failed the attention check, leaving 957 participants for analysis ( $M_{\text{age}} = 31.50$  years; 57.4% female).

## ***Results***

To analyze willingness to spend, I conducted a logistic regression, with a dependent variable of willingness to buy the headphones (“Yes” coded as 1). The independent variables were transaction history of the money (“refund” coded as 1), location of deposit (“gift card” coded as 1), and their interaction.

Replicating prior results, refunded money was more likely to be spent than payment when the money was in a checking account (77.9% vs. 54.3%,  $\chi^2(1) = 28.32, p < .001$ ). This difference was smaller when the money was on a gift card (80.5% vs. 70.0%,  $\chi^2(1) = 7.38, p = .007$ ).

Put differently, payments were more likely to be spent when the money was on a gift card versus in a checking account (70.0% vs. 54.3%  $\chi^2(1) = 12.74, p < .001$ ). However, for refunds, willingness to spend was not reliably affected by the money's location (80.5% vs. 77.9%,  $\chi^2(1) = 0.47, p = .495$ ). The transaction history of the money x deposit location interaction was marginally significant ( $b = .52, Wald = 3.09, p = .079$ ; see Figure 4).

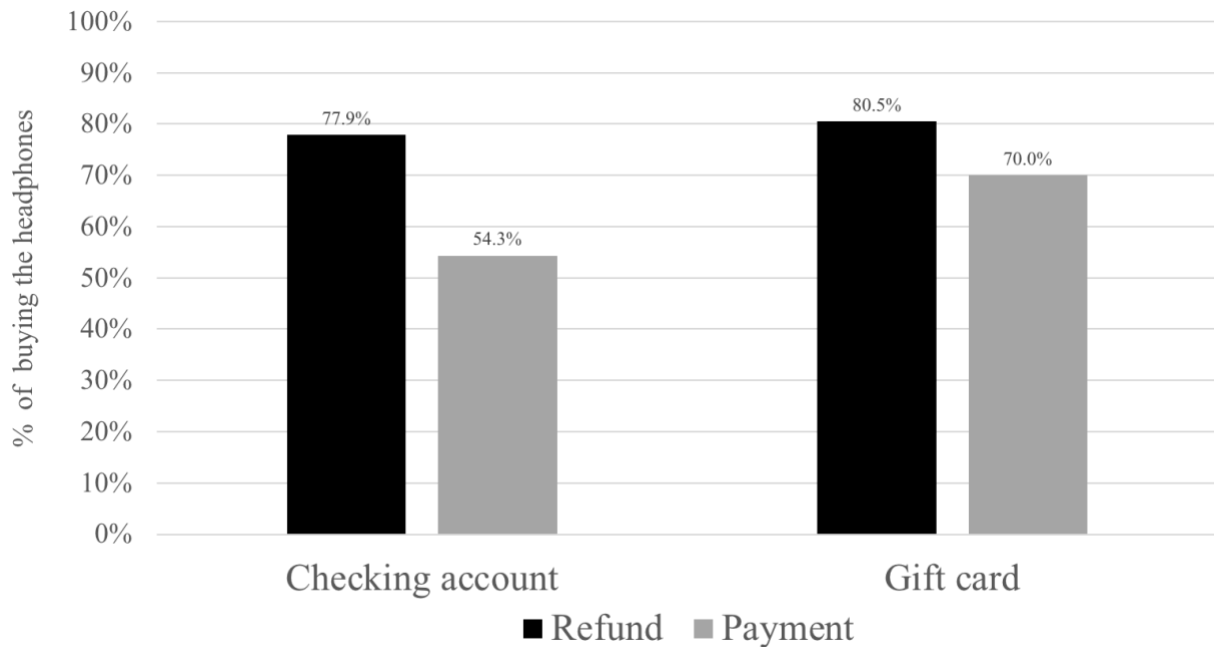


Figure 4. Willingness to spend by condition in study 4a

### ***Discussion***

People frequently spend refunds more readily than payments, perhaps because refunds are generally coded as “spending money.” However, consistent with Hypothesis 3a, when money is framed as “spending money” in other ways such as when stored on a gift card, the refund-

payment difference is attenuated specifically because the willingness to spend the payment increases.

I have hypothesized that refunded money is more likely to be spent because it feels free from obligations. Study 4a provided evidence for this account by making payment feel freer from obligations. In study 4b, I provided additional evidence for this account by making refunds feel more tied to obligations.

## **2.7.2 Study 4b**

### ***Methods***

This study was pre-registered at <https://aspredicted.org/blind.php?x=5zy5am>. I recruited 842 Mturk workers ( $M_{\text{age}} = 36.99$  years; 47.3% female).

The study followed a 2 (transaction history of money: refund versus payment) by 2 (location of deposit: checking account versus a savings account earmarked for retirement) fully between-subjects design. All participants were first asked to imagine that every week they spend time completing HITs on Mturk. Then, I manipulated the transaction history of the money in the same way as in study 4a.

I also manipulated the location of deposit. Participants in the checking-account condition read that their payment or refund was automatically deposited into their checking account. Participants in the savings-account condition read that their payment or refund was automatically deposited into a savings account that they set aside for retirement. On the next screen, I presented a screenshot of their account activity. The screenshots matched the scenario that participants just read.

Participants were then offered a chance to buy a pair of headphones that was on sale for \$20. I asked participants if they would buy the headphones with the money they received (“Yes,



I would buy the headphones” / “No, I would not buy the headphones”, order randomized).<sup>2</sup> As outlined in the pre-registration, I included an attention-check question that asked participants whether they had been asked to consider spending money from their checking account, spending money from a savings account that they had set aside for retirement, or spending cash. In my pre-registration, I planned to use this attention check for exploratory purposes only, so below I report results from the full sample. Appendix 7 contains the results after excluding participants who failed the attention check. The pattern of results was the same whether or not I exclude participants who failed the attention check.

### ***Results***

To analyze willingness to spend, I again conducted a logistic regression, with a dependent variable of willingness to buy the headphones (“Yes” coded as 1). The independent variables were transaction history of the money (“refund” coded as 1), location of deposit (“checking account” coded as 1), and their interaction.

As predicted, I found a significant interaction between the transaction history of the money and the location of deposit ( $b = .62$ , Wald = 4.41,  $p = .036$ ; see Figure 5). Refunds were more likely to be spent than payments when the money was in a checking account (76.4% vs. 50.2%,  $\chi^2(1) = 31.07$ ,  $p < .001$ ), replicating prior results. This difference was attenuated when the money was in a savings account earmarked for retirement (44.6% vs. 31.7%,  $\chi^2(1) = 7.38$ ,  $p = .007$ ). These results suggest that when refunded money is put into an account with a specific purpose, a new financial obligation is created, decreasing the willingness to spend.

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<sup>2</sup> I included one additional measure in this study that is not used elsewhere in the paper: “To what extent does the \$20 in this scenario feel like money to be saved versus money to be spent?”. Appendix 7 presents the results.

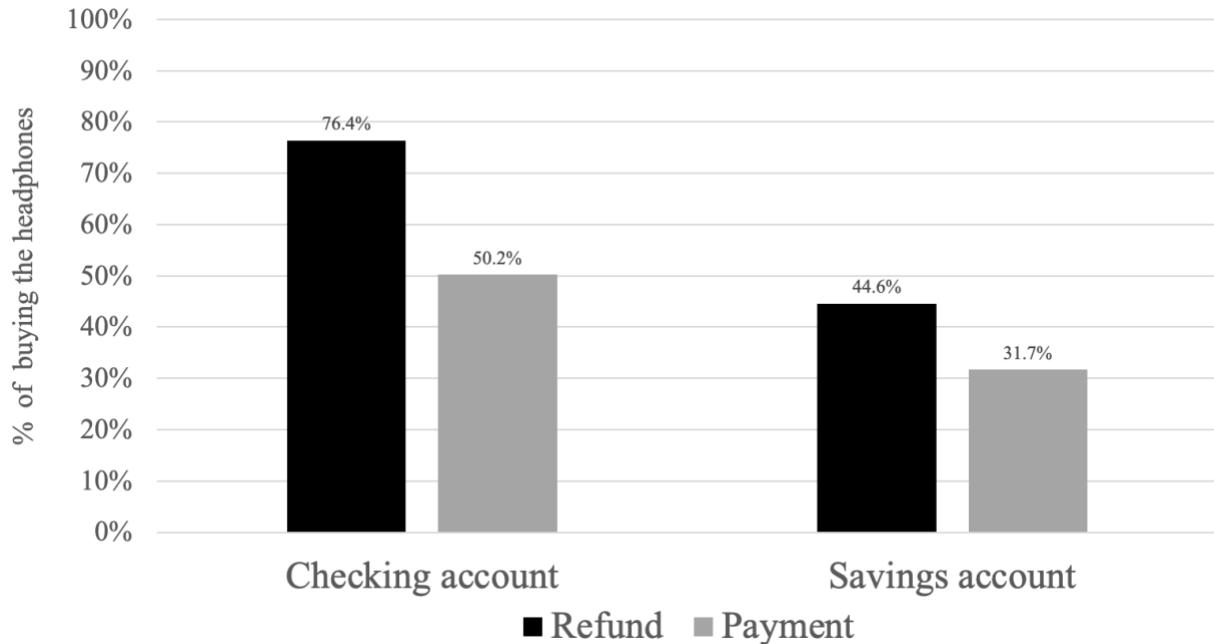


Figure 5. Willingness to spend by condition in study 4b

### *Discussion*

In study 4b I again attenuated the difference between refunded money and payments by manipulating where the money is deposited. Consistent with Hypothesis 3b, when the money was deposited into a savings account earmarked for retirement, the difference between the likelihood of spending refunds and payments was less pronounced. I propose that this effect emerges because refunded money no longer feels like “spending money” or free from obligations when it is deposited into an account that is earmarked for a specific saving goal.

Overall, I propose that refunded money is generally more likely to be spent because refunds retain the “spending money” earmark and therefore feel free from obligations. In study 4a, I found that payments are spent at rates closer to refunds when an external cue suggests that payments should feel free from obligations. In study 4b, I found that refunds are spent at much lower rates when an external cue adds an obligation. Together, the two studies provided experimental evidence to shed light on when and why refunded money is more likely to be spent.

## **Chapter 3: General Discussion**

### **3.1 Summary**

Across eight studies using different samples and scenarios, I found that willingness to spend money is influenced by the transaction history of that money. In particular, money refunded from previous purchases is consistently more likely to be spent than other types of non-refunded money. I found that refunds are more likely to be spent than standard income payments in both hypothetical (studies 1a-1c) and real (study 2) spending situations. This refund effect incurred when the refund is returned in cash (study 1c), in bank accounts (studies 1a and 1b, study 3a and study 4a) and in gift cards (study 4b). Study 3a showed that the feeling of being free from obligations mediated this difference in spending. Study 3b provided similar mediational evidence while also showing that standard purchase refunds feel freer from obligations than, and are more likely to be spent than, tax refunds. Finally, studies 4a and 4b manipulated where funds are deposited to show that when payments feel less obligated, they are more likely to be spent, and when refunds feel more obligated, they are less likely to be spent.

I observe that refunded money is more likely to be spent even though it is perceived less like a financial gain than is non-refunded money (study 1c and study 3b). This suggests that people realize that refunds are their own money coming back to them, but nevertheless find them especially worthy of spending. This finding is notable in light of the first pilot study that I report in the introduction, in which only a small minority of participants expressed a belief that refunds “should” be spent.

### **3.2 Theoretical Contribution**

This research contributes to theorizing about how the transaction history of money influences its subsequent usage (Gneezy, Imas, and Madarasz 2014; Imas, Loewenstein, and

Morewedge 2017; Levav and McGraw 2009; Raghurir and Santana 2019). Prior work has investigated the impact of emotional and moral labels created in the transaction process (Gneezy, Imas, and Madarasz 2014; Imas, Loewenstein, and Morewedge 2017; Levav and McGraw 2009). I focused on the case of purchase refunds and showed that merely having a transaction history of spending influences consumers' willingness to spend. I found that because the money goes through the spend-and-refund process, it now feels free from obligations and available for a discretionary purchase.

My work also contributes to the understanding of how mental accounting operates. In a classic paper, Thaler (1999) outlined the components and functions of mental accounting. However, less is known about how consumers use mental accounting to code and categorize their day-to-day transactions. In this research, I investigated how consumers treat money with a "past." I found that after receiving refunds from previous purchases, consumers are more willing to make new purchases. Interestingly, there is no objective change for the consumer in the refund process: their wealth and possessions remain the same. The transaction history does not change any objective features of the refunded money either: the money is returned in its full amount. Yet still, consumers behave differently, revealing intriguing aspects of the operations of mental accounting.

Lastly, this research contributes to the literature on how the feeling of a financial gain influences consumers' willingness to spend (Arkes et al. 1994; Epley, Mak, and Idson 2006; Kahneman and Tversky 1979; Lozza, Carrera, and Bosio 2010). In this research, I observed that even though refunds do not bring true gains to one's wealth and are perceived less like financial gains than non-refunded money, refunds are more likely to be spent freely. I provided evidence

showing the unique psychological mechanism of the refund effect: the refunded money retains the “spending money” earmark in the transaction process and feels free from obligations.

### **3.3 Marketing Implications**

My findings have important pragmatic implications. My work shows that consumers will use refunds to buy things that they typically would not have bought if they had not received the refunded money. This suggests that retailers can stop thinking of returns and refunds as costs and lost sales. Instead, retailers should start to view returns and refunds as new chances for revenues and profits.

There are many ways for retailers to claim a share of the billion’s worth of refunds. For example, when consumers return products online, retailers can ask consumers if they would like to apply their refund to other products in their wish list. Consumers who return products in-store are a lucrative market segment that retailers should target at. The consumer is already physically in the store and the refunded money feels free to spend. To turn this foot traffic into real revenue, retailers can offer refunds as gift cards or store credits. Retailers can also strategically redesign the shelf layout near the return counter, and where the return counter is located in the store.

My findings can also help consumers to better navigate their own behavior. I theorize that purchase refunds are easy to spend on discretionary purchases because they retain the “spending money” earmark. Study 4b suggests one possible intervention for consumers interested in controlling spending: When consumers have a choice for where the refunds are returned to, they can choose to have their refunds returned to a savings account that is earmarked for responsible goals. For example, credit card companies can help consumers with this, such as providing cardholders with the option of automatically transferring refunds into a separate savings account. Because credit cards were the most common types of payment used during the original purchase

that led to a return (National Retail Federation 2021), this intervention could generate a large impact. Having the money in an earmarked savings account may help consumers to not view refunds as free, spendable money (if that is their wish).

### **3.4 Future Directions**

This research suggests a number of future directions. An interesting revenue for future research may be to examine when the refund effect occurs. Throughout the studies, I examined whether consumers are more likely to spend refunds right after receiving the money. One may wonder if the refund effect might happen at an earlier time point, such as right after consumers submit the refund request or drop off the returned product. Central to my conceptualization is the idea that refunded money is originally categorized as “spending money” and the earmark retains in the transaction process. As such, once consumers make the decision to return, they may feel that they have or will soon have a sum of money that is free from obligations and available to spend. Therefore, it is possible that refund effect will happen even before the refund money actually arrives.

In the current research, I studied how receiving a refund increases the propensity to spend. I used a binary choice question and found that consumers are more likely to make a discretionary purchase with refunds. Future research could further investigate whether receiving a refund changes how the money will be spent. As noted in the second pilot study in the introduction, people often report spending refunds on more expensive products and on hedonic consumption. Fleshing out how consumers’ preferences change with refunded money is a worthwhile future direction for subsequent research.

Another direction for future research might be to examine other types of refunds besides refunds from previous purchases. For example, consumers pay deposits for renting apartments.

When the leasing term ends, the deposit is returned to consumers. One question is whether a refunded deposit will be spent in the same way as money refund from previous purchases. My framework suggests that the refunded deposit will not be spent in the same way as a purchase refund. Although deposits go through the same transaction process, this type of money has not been previously earmarked for spending and therefore should not necessarily feel available to spend.

### **3.5 Conclusion**

This paper examines how people's willingness to spend depends on the transaction history of their money, such that money refunded from previous purchases is more likely to be spent than non-refunded money. My work thus suggests that, although refunds do not increase wealth, they are nevertheless readily spent.

## References

- Abeler, Johannes, and Felix Marklein. "Fungibility, labels, and consumption." *Journal of the European Economic Association* 15, no. 1 (2017): 99-127.
- Agarwal, Sumit, and Wenlan Qian. "Consumption and debt response to unanticipated income shocks: Evidence from a natural experiment in Singapore." *American Economic Review* 104, no. 12 (2014): 4205-4230.
- Arkes, Hal R., Cynthia A. Joyner, Mark V. Pezzo, Jane Gradwohl Nash, Karen Siegel-Jacobs, and Eric Stone. "The psychology of windfall gains." *Organizational Behavior and Human Decision Processes* 59, no. 3 (1994): 331-347.
- Bodkin, Ronald. "Windfall Income and Consumption." *The American Economic Review* 49, no. 4 (1959): 602-614.
- Cheema, Amar, and Dilip Soman. "Malleable mental accounting: The effect of flexibility on the justification of attractive spending and consumption decisions." *Journal of Consumer Psychology* 16, no. 1 (2006): 33-44.
- Choe, Yuna, and Christina Kan. "Budget depreciation: when budgeting early increases spending." *Journal of Consumer Research* 47, no. 6 (2021): 937-958.
- Epley, Nicholas, Dennis Mak, and Lorraine Chen Idson. "Bonus of rebate? The impact of income framing on spending and saving." *Journal of Behavioral Decision Making* 19, no. 3 (2006): 213-227.
- Gneezy, Uri, Alex Imas, and Kristóf Madarász. "Conscience accounting: Emotion dynamics and social behavior." *Management Science* 60, no. 11 (2014): 2645-2658.
- Gourville, John T., and Dilip Soman. "Payment depreciation: The behavioral effects of temporally separating payments from consumption." *Journal of Consumer Research* 25, no. 2 (1998): 160-174.
- Grinstein-Weiss, Michal, Cynthia Cryder, Mathieu R. Despard, Dana C. Perantie, Jane E. Oliphant, and Dan Ariely. "The role of choice architecture in promoting saving at tax time: Evidence from a large-scale field experiment." *Behavioral Science & Policy* 3, no. 2 (2017): 20-38.
- Hastings, Justine S., and Jesse M. Shapiro. "Fungibility and consumer choice: Evidence from commodity price shocks." *The Quarterly Journal of Economics* 128, no. 4 (2013): 1449-1498.
- Heath, Chip, and Jack B. Soll. "Mental budgeting and consumer decisions." *Journal of Consumer Research* 23, no. 1 (1996): 40-52.
- Heilman, Carrie M., Kent Nakamoto, and Ambar G. Rao. "Pleasant surprises: Consumer response to unexpected in-store coupons." *Journal of Marketing Research* 39, no. 2 (2002): 242-252.
- Henderson, Pamela W., and Robert A. Peterson. "Mental accounting and categorization." *Organizational Behavior and Human Decision Processes* 51, no. 1 (1992): 92-117.
- Hodge, Sharon K., and Charlotte H. Mason. "Work versus windfall: An exploration of saving on subsequent purchase." *Marketing Letters* 6, no. 2 (1995): 91-100.
- Imas, Alex, George Loewenstein, and Carey K. Morewedge. "Mental money laundering: A motivated violation of fungibility." *Journal of the European Economic Association* (2020).



- Kahneman, Daniel, and Amos Tversky. "Prospect Theory: An analysis of decision under risk." *Econometrica* 47, no. 2 (1979): 263-292.
- Kooreman, Peter. "The labeling effect of a child benefit system." *American Economic Review* 90, no. 3 (2000): 571-583.
- Levav, Jonathan, and A. Peter McGraw. "Emotional accounting: How feelings about money influence consumer choice." *Journal of Marketing Research* 46, no. 1 (2009): 66-80.
- Lozza, Edoardo, Sonia Carrera, and A. Claudio Bosio. "Perceptions and outcomes of a fiscal bonus: Framing effects on evaluations and usage intentions." *Journal of Economic Psychology* 31, no. 3 (2010): 400-404.
- Mendenhall, Ruby, Kathryn Edin, Susan Crowley, Jennifer Sykes, Laura Tach, Katrin Kriz, and Jeffrey R. Kling. "The role of earned income tax credit in the budgets of low-income households." *Social Service Review* 86, no. 3 (2012): 367-400.
- Milkman, Katherine L., and John Beshears. "Mental accounting and small windfalls: Evidence from an online grocer." *Journal of Economic Behavior & Organization* 71, no. 2 (2009): 384-394.
- National Retail Federation, "Consumer Returns in the Retail Industry 2021," <https://cdn.nrf.com/sites/default/files/2022-01/Consumer%20Returns%20in%20the%20Retail%20Industry%202021.pdf>
- National Retail Federation, "2022 Tax Return Study," <https://nrf.com/topics/holiday-and-seasonal-trends/tax-returns>
- O'curry, Suzanne, and Michal Strahilevitz. "Probability and mode of acquisition effects on choices between hedonic and utilitarian options." *Marketing Letters* 12, no. 1 (2001): 37-49.
- Pomerance, Justin, Nicholas Reinholtz, Stephen A. Spiller, and Elizabeth C. Webb. "The effects of earmarking on psychological spending and pain of payment." *Association for Consumer Research North American Advances* (2019): 164-168
- Raghubir, Priya, and Shelle Santana. "Source, form, and form of the source: A malleable, monopoly money phenomena." *Association for Consumer Research North American Advances* (2019): 281-285
- Prelec, Drazen, and George Loewenstein. "The red and the black: Mental accounting of savings and debt." *Marketing Science* 17, no. 1 (1998): 4-28.
- Reinholtz, Nicholas, Daniel M. Bartels, and Jeffrey R. Parker. "On the mental accounting of restricted-use funds: How gift cards change what people purchase." *Journal of Consumer Research* 42, no. 4 (2015): 596-614.
- Shapiro, Matthew D., and Joel Slemrod. "Consumer response to tax rebates." *American Economic Review* 93, no. 1 (2003): 381-396.
- Shefrin, Hersch M., and Richard H. Thaler. "The behavioral life-cycle hypothesis." *Economic Inquiry* 26, no. 4 (1988): 609-643.
- Simmons, Joseph P., Leif D. Nelson, and Uri Simonsohn. "A 21 word solution." *Available at SSRN 2160588* (2012).
- Soman, Dilip, and Amar Cheema. "Earmarking and partitioning: Increasing saving by low-income households." *Journal of Marketing Research* 48, no. SPL (2011): S14-S22.
- Souleles, Nicholas S. "The response of household consumption to income tax refunds." *American Economic Review* 89, no. 4 (1999): 947-958.

- Stilley, Karen M., J. Jeffrey Inman, and Kirk L. Wakefield. "Planning to make unplanned purchases? The role of in-store slack in budget deviation." *Journal of Consumer Research* 37, no. 2 (2010): 264-278.
- Sussman, Abigail B., and Rourke L. O'Brien. "Knowing when to spend: Unintended financial consequences of earmarking to encourage savings." *Journal of Marketing Research* 53, no. 5 (2016): 790-803.
- Thaler, Richard H. "Mental accounting and consumer choice." *Marketing Science* 4, no. 3 (1985): 199-214.
- Thaler, Richard H. "Mental accounting matters." *Journal of Behavioral Decision Making* 12, no. 3 (1999): 183-206.
- U.S. Bureau of Economic Analysis, "Personal Income and Outlays, December 2020," <https://www.bea.gov/sites/default/files/2021-01/pi1220.pdf>.
- U.S. Bureau of Labor Statistics, "Consumer Expenditures Report 2019," <https://www.bls.gov/opub/reports/consumer-expenditures/2019/home.htm>.
- White, Rebecca J. "Format matters in the mental accounting of funds: The case of gift cards and cash gifts." Available at SSRN 948587 (2006).
- Zhang, C. Yiwei, and Abigail B. Sussman. "The role of mental accounting in household spending and investing decisions." *Client Psychology. New York: Wiley, Chicago Booth Research Paper* 19-07 (2017).

## **Appendices**

Appendix 1: Appendix to Chapter 2.1

Appendix 2: Appendix to Chapter 2.2

Appendix 3: Appendix to Chapter 2.3

Appendix 4: Appendix to Chapter 2.4

Appendix 5: Appendix to Chapter 2.5

Appendix 6: Appendix to Chapter 2.6

Appendix 7: Appendix to Chapter 2.7.2

## Appendix 1: Appendix to Chapter 2.1

| Refund Condition   | Payment Condition                         |             |        |              |   |         |   |      |             |        |              |                                     |         |
|--|---|-------------|--------|--------------|---|---------|---|------|-------------|--------|--------------|-------------------------------------|---------|
| <p>We would like you to consider the following scenario from the perspective of somebody who regularly spends time completing studies on Prolific.</p> <p>Imagine that last week you earned \$20 on Prolific and bought a \$20 T-shirt from Amazon using the money that you earned.</p> <p>You found that you no longer needed the T-shirt after you received it. You returned the product and submitted a refund request online. Your refund was automatically deposited into your checking account.</p> <p>Today, you checked your account. Below is a screenshot of your checking account activity:</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"><p><b>Checking Account Activity</b> <small>Page 1 of 1 (1 total transaction)</small></p><table style="width: 100%; border-collapse: collapse;"><thead><tr><th style="text-align: left;">Date</th><th style="text-align: left;">Description</th><th style="text-align: right;">Amount</th></tr></thead><tbody><tr><td style="text-align: left;">May 27, 2021</td><td style="text-align: left;">Refund from Amazon Purchase (113-5464576)</td><td style="text-align: right;">\$20.00</td></tr></tbody></table></div> <p>Now imagine that you are shopping at one of your favorite stores, and you notice that a pair of headphones is on sale for \$20 (regular price: \$29.95). You have been interested in getting some new headphones.</p> <p>With the \$20 refund you received that was deposited into your checking account, would you buy the headphones for \$20?</p> | Date                                      | Description | Amount | May 27, 2021 | Refund from Amazon Purchase (113-5464576) | \$20.00 | <p>We would like you to consider the following scenario from the perspective of somebody who regularly spends time completing studies on Prolific.</p> <p>Imagine that last week you earned \$20 on Prolific. You decided to cash out your earnings via PayPal. From there, the money was automatically deposited into your checking account.</p> <p>Today, you checked your account. Below is a screenshot of your checking account activity:</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"><p><b>Checking Account Activity</b> <small>Page 1 of 1 (1 total transaction)</small></p><table style="width: 100%; border-collapse: collapse;"><thead><tr><th style="text-align: left;">Date</th><th style="text-align: left;">Description</th><th style="text-align: right;">Amount</th></tr></thead><tbody><tr><td style="text-align: left;">May 27, 2021</td><td style="text-align: left;">Payment from Prolific (113-5464576)</td><td style="text-align: right;">\$20.00</td></tr></tbody></table></div> <p>Now imagine that you are shopping at one of your favorite stores, and you notice that a pair of headphones is on sale for \$20 (regular price: \$29.95). You have been interested in getting some new headphones.</p> <p>With the \$20 payment you received that was deposited into your checking account, would you buy the headphones for \$20?</p> | Date | Description | Amount | May 27, 2021 | Payment from Prolific (113-5464576) | \$20.00 |
| Date   | Description                               | Amount      |        |              |   |         |   |      |             |        |              |                                     |         |
| May 27, 2021   | Refund from Amazon Purchase (113-5464576) | \$20.00     |        |              |   |         |   |      |             |        |              |                                     |         |
| Date   | Description                               | Amount      |        |              |   |         |   |      |             |        |              |                                     |         |
| May 27, 2021   | Payment from Prolific (113-5464576)       | \$20.00     |        |              |   |         |   |      |             |        |              |                                     |         |

## Appendix 2: Appendix to Chapter 2.2

| Refund Condition   | Payment Condition |        |   |         |  |             |        |                                     |         |
|--|-------------------|--------|---|---------|--|-------------|--------|-------------------------------------|---------|
| <p>We would like you to consider the following scenario from the perspective of somebody who regularly spends time completing studies on Prolific.</p> <p>Imagine that last week you earned \$20 on Prolific and bought a \$20 phone case from Amazon using the money that you earned.</p> <p>When you received the phone case, you found that you did not quite like it. So you returned the product and submitted a refund request online. You were informed that your refund would be automatically deposited into your checking account.</p> <p>At the end of this week, you checked your account. Below is a screenshot of your checking account activity:</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p><b>Checking Account Activity</b> Page 1 of 1 (1 total transactions)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid #ccc;">Description</th> <th style="text-align: right; border-bottom: 1px solid #ccc;">Amount</th> </tr> </thead> <tbody> <tr> <td style="border: 1px solid #ccc; padding: 2px;">Refund from Amazon Purchase (113-5464576)</td> <td style="text-align: right; border: 1px solid #ccc; padding: 2px;">\$20.00</td> </tr> </tbody> </table> </div> <p>Now imagine that you are shopping at one of your favorite stores, and you notice that a pair of headphones is on sale for \$20 (regular price: \$29.95). You have been interested in getting some new headphones.</p> <p>With the <b>\$20 refund</b> you received that was deposited into your checking account, would you buy the headphones for \$20?</p> | Description       | Amount | Refund from Amazon Purchase (113-5464576) | \$20.00 | <p>We would like you to consider the following scenario from the perspective of somebody who regularly spends time completing studies on Prolific.</p> <p>Imagine that last week you earned \$20 on Prolific and bought a \$20 phone case from Amazon using the money that you earned.</p> <p>When you received the phone case, you found that you quite liked it. So you kept the phone case.</p> <p>This week, you continued to complete studies on Prolific and earned \$20. You decided to cash out your earnings via PayPal. From there, the money was automatically deposited into your checking account.</p> <p>At the end of this week, you checked your account. Below is a screenshot of your checking account activity:</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p><b>Checking Account Activity</b> Page 1 of 1 (1 total transactions)</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid #ccc;">Description</th> <th style="text-align: right; border-bottom: 1px solid #ccc;">Amount</th> </tr> </thead> <tbody> <tr> <td style="border: 1px solid #ccc; padding: 2px;">Payment from Prolific (113-5464576)</td> <td style="text-align: right; border: 1px solid #ccc; padding: 2px;">\$20.00</td> </tr> </tbody> </table> </div> <p>Now imagine that you are shopping at one of your favorite stores, and you notice that a pair of headphones is on sale for \$20 (regular price: \$29.95). You have been interested in getting some new headphones.</p> <p>With the <b>\$20 payment</b> you received that was deposited into your checking account, would you buy the headphones for \$20?</p> | Description | Amount | Payment from Prolific (113-5464576) | \$20.00 |
| Description  | Amount            |        |   |         |  |             |        |                                     |         |
| Refund from Amazon Purchase (113-5464576)  | \$20.00           |        |   |         |  |             |        |                                     |         |
| Description  | Amount            |        |   |         |  |             |        |                                     |         |
| Payment from Prolific (113-5464576)  | \$20.00           |        |   |         |  |             |        |                                     |         |

### **Appendix 3: Appendix to Chapter 2.3**

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| <b>Refund Condition</b>  | <b>Payment Condition</b>  | <b>Windfall Condition</b>  |
|--|---|--|
| Imagine that last week you bought a \$20 phone case but then later decided to return it. You went to the nearby store and asked for a refund. You received \$20 in cash as the refund. | Imagine that you work as a part-time pet sitter and last week you pet-sat for someone in your neighborhood. You received \$20 in cash as your payment.                              | Imagine that last week you bought a lottery ticket and then later learned that you won \$20 from it. You went to a nearby lottery retailer and redeemed the prize money. You received \$20 in cash as the prize. |
| Imagine that, on your way home from getting your refund, you walk by your favorite clothing store and see a shirt for \$20 that you really like. Would you buy the shirt for \$20?     | Imagine that, on your way home from getting your payment, you walk by your favorite clothing store and see a shirt for \$20 that you really like. Would you buy the shirt for \$20? | Imagine that, on your way home from getting your prize money, you walk by your favorite clothing store and see a shirt for \$20 that you really like. Would you buy the shirt for \$20?                          |

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#### **Appendix 4: Appendix to Chapter 2.4**

**Reminder: you have received a [refund / payment] of 10 cents.**

Now, we have a question for you about donations. **Although many decisions on Prolific are hypothetical, this one is real.**

You can choose whether or not to donate your 10-cent [refund / payment] to Feeding America. Feeding America is America's largest domestic hunger-relief organization.

If you choose not to donate, you will keep your 10-cent [refund / payment].

No matter what you choose, you will still be paid the original 35 cents that we promised you for completing this study.

Would you like to donate your 10-cent [refund / payment] to Feeding America?

Yes, I would like to donate my 10-cent [refund / payment] to Feeding America.

No, I would like to receive my 10-cent [refund / payment] at the end of this study.

## **Appendix 5: Appendix to Chapter 2.5**

This appendix study was designed to replicate study 3a and examined the proposed psychological mechanism. I predicted that refunds would be more likely to be spent than payments, and this is because refunds would feel freer from financial obligations than payments.

Most critically, this appendix study tested whether the feeling of financial gain explained the refund effect. Consistent with results from study 1c, I predicted that refunds would feel less like financial gains than payments. I further expected that feeling free from obligations would better explain why refunded money is more likely to be spent than feeling of financial gain would.

### ***Methods***

This study was pre-registered at <https://aspredicted.org/blind.php?x=mq5vg7>. I recruited 400 Mturk workers ( $M_{\text{age}} = 40.68$  years; 54.3% female) and randomly assigned them to either the refund or payment condition.

The main manipulation and materials were similar to study 3a. In both the refund and payment conditions, participants imagined that they regularly spend time completing HITs on Mturk and that last week they earned \$20 on Mturk. Participants in the refund condition were further told that they spent the money on a \$20 T-shirt, then returned the T-shirt and received a \$20 refund. All participants were then offered a chance to buy a pair of headphones that was on sale for \$20, and they indicated if they would like to buy the headphones with the money they received (“Yes, I would buy the headphones” / “No, I would not buy the headphones”, order randomized).

Next, I reminded participants of the scenario that they just read. Participants in the refund condition were reminded that they received \$20 as a refund, and the money was deposited into



their checking account. Participants in the payment condition were reminded that they received \$20 as a payment that was deposited into their checking account. After this recap, to measure whether the money feels free from obligations, I asked participants the following three questions in order: “To what extent would you feel like the money is available to you for spending?”, “To what extent would you feel free to spend the money on anything you wanted?”, and “To what extent would the \$20 seem free from financial obligations?” (1 = “Not at all” to 7 = “Extremely”). Finally, I asked participants to what extent the money felt like a financial gain or a loss on the same scale used in study 1c.

Participants also answered an attention-check question (“In the scenario that you just read, what were you asked about? Buying headphones for \$20 / Buying headphones for \$100 / I don’t know.”). All participants passed the attention check and no data were excluded from analyses.

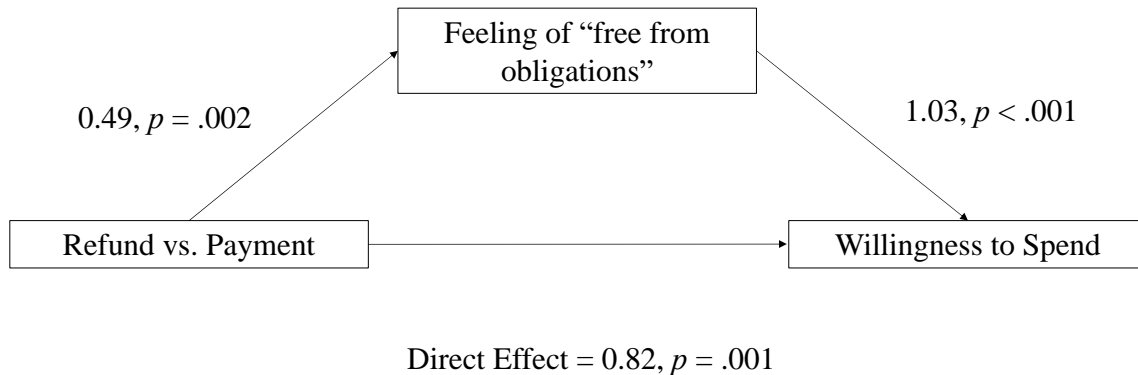
## ***Results***

Participants in the refund condition were more likely to spend the money on the headphones (70.4%) than those in the payment condition (48.8%,  $\chi^2(1) = 19.35, p < .001$ ). Thus, I replicated the general finding that refunds are more likely to be spent than payments.

Refunds also felt freer from obligations than payments. I averaged the three items measuring the feeling of being free from obligations into a composite score ( $\alpha = .82$ ), with higher numbers indicating greater freedom from obligations. On this composite, refunds felt freer (were rated higher) than payments ( $M_{\text{refund}} = 5.51, SD_{\text{refund}} = 1.33; M_{\text{payment}} = 5.02, SD_{\text{payment}} = 1.72; t(1,398) = 3.21, p = .001$ ).

Next, I tested whether feeling free from obligations mediated the effect of transaction history on willingness to spend. I fit a mediation model using the PROCESS macro in SPSS. In

this mediation model, the indirect effect of transaction history (refund vs. payment) on willingness to spend via feeling free from obligations was significant (0.51, 95% CI [0.19, 0.85]). The direct effect of transaction history on willingness to spend remained significant as well ( $b = 0.82, p = .001$ ).



Indirect effect = 0.51, 95% CI [0.19, 0.85].

#### Appendix study 1: mediation model

I also found that refunds also felt less like a financial gain than payments ( $M_{\text{refund}} = 0.91, SD_{\text{refund}} = 1.21; M_{\text{payment}} = 2.06, SD_{\text{payment}} = 1.24; t(1,398) = 9.35, p < .001$ ). The feeling of financial gain (or lack thereof) did not mediate the effect of transaction history on willingness to spend (Indirect Effect:  $-.11, 95\% \text{ CI } [-0.32, 0.10]$ ).

#### **Discussion**

Appendix study 1 replicated the finding that refunds are more likely to be spent than are equivalent payments. Refunds feel freer from obligations than are payments, and this difference mediates the difference in spending between refunds and payments. Appendix study 1 further showed that refunds feel less like a gain than payments do, and the feeling of financial gain does not mediate the refund effect.

## Appendix 6: Appendix to Chapter 2.6

| Purchase Refund Condition   | Tax Refund Condition  |
|---|---|
| <p>Imagine that every month you spend time completing studies on Prolific as well as working at other jobs.</p> <p>Your earnings balance on Prolific recently reached \$500, so you decided to cash out your earnings via PayPal. From there, the money was automatically deposited into your bank account.</p> <p>You wanted to replace the sofa set in your living room, so you bought a new sofa set from Amazon for \$500, using the money that you earned from Prolific.</p> <p>When you received the new sofa set, you found that you did not quite like it. You also changed your mind and no longer wanted to replace the old set. So you returned the new sofa set. You submitted a refund request and \$500 was automatically returned to your bank account.</p> <p>Today, you checked your account. Below is a screenshot of your bank account activity:</p> | <p>Imagine that every month you spend time completing studies on Prolific as well as working at other jobs.</p> <p>Recently, you filed your tax return for this year. You chose to e-file your return, and your return showed a refund amount of \$500.</p> <p>A few days later, you checked your tax refund status. You found that your tax return had been processed and that \$500 would be automatically deposited into your bank account.</p> <p>Today, you checked your account. Below is a screenshot of your bank account activity:</p> |

**Account Activity** Page 1 of 7 (1 total transaction today)

| Date              | Description   | Amount   |
|-------------------|---|----------|
| 04/26/2021, 09:32 | Refund from Amazon Purchase ( <a href="#">113-5464576</a> ) | \$500.00 |
|                   | 04/19/2021)   |          |

**Account Activity** Page 1 of 7 (1 total transaction today)

| Date              | Description  | Amount   |
|-------------------|--|----------|
| 04/26/2021, 09:32 | IRS Tax Refund Deposit ( <a href="#">113-5464576</a> ) | \$500.00 |

Now imagine that you are shopping at one of your favorite stores, and you notice that a model of iPad is on sale. The model on sale is a 10.2-inch iPad, Wi-Fi + Cellular, 128G. The promotional price is \$500 (regular price: \$559). You have been interested in getting this particular model of iPad. The color you like is also available. With the \$500 refund you received that is now in your bank account, would you buy the iPad?

Now imagine that you are shopping at one of your favorite stores, and you notice that a model of iPad is on sale. The model on sale is a 10.2-inch iPad, Wi-Fi + Cellular, 128G. The promotional price is \$500 (regular price: \$559). You have been interested in getting this particular model of iPad. The color you like is also available. With the \$500 tax refund you received that is now in your bank account, would you buy the iPad?

## **Appendix 7: Appendix to Chapter 2.7.2**

In study 4b, participants were also asked to what extent the money felt like money to be saved versus money to be spent (1 = “Feels completely like money to be saved” to 7 = “Feels completely like money to be spent”). This question was asked after participants indicated whether they would like to buy the headphones and before the attention-check question.

A 2 (transaction history of money: refund versus payment) x 2 (location of deposit: checking account versus savings account) ANOVA found a main effect of transaction history ( $F(1, 838) = 32.28, p < .001$ ), such that refunds felt more like money to be spent than payments ( $M_{\text{refund}} = 4.10, SD_{\text{refund}} = 1.96; M_{\text{payment}} = 3.34, SD_{\text{payment}} = 2.09$ ). The main effect of deposit location was also significant ( $F(1, 838) = 41.45, p < .001$ ), such that money deposited into a checking account felt more like money to be spent than money deposited into a savings account earmarked for retirement ( $M_{\text{checking}} = 4.15, SD_{\text{checking}} = 1.96; M_{\text{savings}} = 3.29, SD_{\text{savings}} = 2.07$ ). The interaction was not significant ( $F(1, 838) = 0.01, p = .928$ ).

Next, I report additional analyses on willingness to spend. In the main text, I reported results on willingness to spend without excluding participants who failed the attention check. Below, I report results after excluding participants who failed the attention check.

717 participants ( $M_{\text{age}} = 41.46$  years; 48.8% female) passed the attention check. For willingness to spend the money, I again found a significant interaction between the transaction history of the money and the location of deposit ( $b = .72, \text{Wald} = 4.79, p = .029$ ). Refunds were more likely to be spent than payments when the money was in a checking account (79.4% vs. 49.5%,  $\chi^2(1) = 34.35, p < .001$ ), but this difference was attenuated when the money was in a savings account earmarked for retirement (42.3% vs. 27.6%,  $\chi^2(1) = 8.60, p = .003$ ). Therefore,

study 4b showed the same pattern of results whether or not I exclude participants who failed the attention check.