

**PURCHASE JUSTIFIABILITY DRIVES PAYMENT CHOICE:
CONSUMERS PAY WITH CARD TO REMEMBER AND CASH TO FORGET**

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ABSTRACT

Although consumers often have multiple payment methods at their fingertips, such as cash and credit/debit cards, prior research is silent on how consumers *choose* between them. We home in on a key element of purchase—purchase justifiability—that affects how consumers choose to pay. Analysis of 118,042 real-world purchases and six experiments reveals that when consumers are motivated to forget (vs. remember) a purchase because they see it as difficult (vs. easy) to justify, they have an increased preference to pay with cash (vs. card) because cards create a “paper/electronic trail” that aids memory retrieval. These payment preferences are strongest among consumers most likely to recall/track their card spending, and manifest only when card expenses are trackable. We reconcile our results with the classic effect of payment method on pain of paying and discuss implications for merchants and for financial institutions designing payment methods of the future.

Keywords: payment method, justifiability, trackability, motivated memory, financial decision-making

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The authors thank Mitch Hedberg, who said “I bought a doughnut and they gave me a receipt for the doughnut; I don't need a receipt for the doughnut. I'll just give you the money, and you give me the doughnut, end of transaction. We don't need to bring ink and paper into this.”

ABSTRACT

Although consumers often have multiple payment methods at their fingertips, such as cash and credit/debit cards, prior research is silent on how consumers *choose* between them. We home in on a key element of purchase—purchase justifiability—that affects how consumers choose to pay. Analysis of 118,042 real-world purchases and six experiments reveals that when consumers are motivated to forget (vs. remember) a purchase because they see it as difficult (vs. easy) to justify, they have an increased preference to pay with cash (vs. card) because cards create a “paper/electronic trail” that aids memory retrieval. These payment preferences are strongest among consumers most likely to recall/track their card spending, and manifest only when card expenses are trackable. We reconcile our results with the classic effect of payment method on pain of paying and discuss implications for merchants and for financial institutions designing payment methods of the future.

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For decades, cashiers have asked customers: “will you be paying with cash or card?” Cashiers still ask this question—even amid a global pandemic that has increased the popularity of digital payment methods (e.g., Apple Pay and cryptocurrencies)—because cash and card remain the most popular payment methods around the world. Indeed, 65% of all point-of-sale transactions globally in 2021 were made using one of these payment methods (24% credit card, 23% debit card, 18% cash; FIS 2022).¹ Despite the persistent popularity of cash and card—and that 90% of households use multiple payment methods (Shepherd 2020)—prior research is silent on how consumers *choose* between them.

This paper provides a first look at how consumers choose to pay. While this decision can be driven by many factors, we home in on one important element of purchase: purchase justifiability (Inman and Zeelenberg 2002; Okada 2005). We theorize that when a purchase is difficult to justify (vs. easy to justify), consumers have an increased preference to pay with cash (vs. card) because they are more motivated to forget the purchase and cards create a “paper/electronic trail” that aids memory retrieval.

Our theorizing highlights the critical role that justifiability plays in consumer behavior (Bettman, Luce, and Payne 1998; Soster, Monga, and Bearden 2010), not only for choosing a product but also for deciding *how to pay* for a chosen product. Our examination connects the justifiability literature with motivated memory theories (Dalton and Huang 2014; Reczek et al. 2018; Winterich, Reczek, and Irwin 2017; Zauberman, Ratner, and Kim 2009), and underscores how the high trackability of credit/debit cards can be a double-edged sword: While trackability helps consumers budget and review past purchases (Kashyap 2016), this particular property of cards can also cause consumers to sometimes *avoid* using them.

CHOOSING HOW TO PAY

Understanding *how* consumers choose to pay—either with cash or a card—is important. Both forms have their drawbacks. Paying with cash can make it more difficult for consumers to monitor finances, as budgeting apps are not automatically synced with cash transactions (Kashyap 2016), and can also negatively affect consumers because consumers part with money up front and do not receive rewards for the purchase. Paying with card, on the other hand, can lead to overspending and debt (Achtziger 2022). Additionally, payment method affects

¹ The remaining 35% of point-of-sale transactions are Digital/Mobile Wallet (29%), Retailer/Bank Financing (4%), Prepaid Card (2%), and Buy Now, Pay Later (1%).

merchants because they can incur a fee when consumers pay with cards, yet consumers using cash are more difficult to target for marketing and promotions. As researchers and practitioners begin to consider payment methods of the future that are either high (e.g., Apple Pay or Venmo) or low in trackability (e.g., some cryptocurrencies), a deeper understanding of the potential drivers of consumers' payment choice is critical for predicting which payment methods will be popular for specific purchase contexts.

This research takes the first step toward understanding the potential drivers. We focus on the construct of purchase justifiability—a *holistic assessment* of the degree to which a purchase seems reasonable to the purchaser (Inman and Zeelenberg 2002; Okada 2005). A variety of factors can contribute to, or be associated with, this perception, such as whether the purchase is indulgent, guilt/regret inducing, expensive, a bad deal, infrequently purchased at the location, hedonic, or short-lasting (Okada 2005; Thaler 1985). Hence, the specific dimensions or aspects that make a purchase hard-to-justify could vary by individuals and contexts. For example, purchasing sports apparel from a university bookstore may feel less justifiable than purchasing textbooks because the former is more hedonic and less frequently purchased at the location. Likewise, purchasing the same service (e.g., Reiki²) might feel less justifiable in some contexts (e.g., when purchased on a whim) than others (e.g., when purchased due to a doctor's recommendation). We chose purchase justifiability to jumpstart this research area because justifiability is an influential construct in the study of consumer behavior (Bettman, Luce, and Payne 1998; Inman and Zeelenberg 2002) and has been shown to drive the types of resources consumers pay with (e.g., consumers prefer to spend time [vs. money] for hedonic and hard-to-justify items, because spending time allows for more elastic justification; Okada 2005; Soster, Monga, and Bearden 2010).

We theorize that when consumers make a purchase that feels hard-to-justify (vs. easy-to-justify), they want to avoid recalling this purchase in the future. Emerging research has documented a variety of strategies that consumers employ to increase their ability to remember or forget. When consumers want to remember, they seek memory pointers (e.g., photographs) that will help them retrieve memories in the future (Winterich, Reczek, and Irwin 2017; Zauberaman, Ratner, and Kim 2009), or generate these pointers/cues themselves (e.g., create

² “Reiki is an energy healing technique that promotes relaxation, reduces stress and anxiety through gentle touch” (Cleveland Clinic 2021).

shopping lists; Block and Morwitz 1999). In contrast, when consumers want to forget because they feel guilty or threatened by the decision/information, they engage in motivated forgetting (Dalton and Huang 2014; Reczek et al. 2018) and information avoidance strategies (Ehrich and Irwin 2005; Huang 2018; Woolley and Risen 2021). Employing these strategies helps protect consumers from negative emotions (e.g., anger, anxiety, embarrassment, guilt; Ehrich and Irwin 2005; Kouchaki and Gino 2015; Sweeny and Miller 2012) and maintain their self-concept (Huang 2018; Sweeny et al. 2010; Woolley and Risen 2021).

We propose that one strategy that can help consumers avoid recalling a hard-to-justify purchase in the future is to pay with cash instead of card, to remove the paper/electronic trails that come with most card purchases and can become memory cues for retrieval. It is important to note that in our framework, payment method choice is a *dependent variable*, which differs from classic mode-of-payment on pain-of-paying research that examines payment method as an independent variable (Raghubir and Srivastava 2008; Shah et al. 2016; Thomas, Desai, and Seenivasan 2011). For instance, Thomas et al. (2011) found that when consumers are assigned to pay with card (vs. cash), they made more hard-to-justify (i.e., “vice”) purchases because there was lower pain associated with paying with card. Orthogonal to and complimenting this finding, we theorize that when consumers first make a purchase and then decide how to pay for that purchase (i.e., choose between card and cash), their preference to pay with cash increases when their basket skews toward having more hard-to-justify items. In Study 5, we provide empirical evidence that both patterns can emerge depending on whether payment method is treated as a dependent variable (i.e., considered after products are chosen) or an independent variable (i.e., assigned or primed before product choices).

STUDY OVERVIEW

We tested our theory through a combination of a real-world dataset (Study 1) and six experiments (Studies 2-5; Table 1). The data and materials including .qsf files for Studies 2-5 are available at https://osf.io/f68mb/?view_only=2ae76ef9443b43b8af8f333076699c8a; we determined sample sizes of our experiments before data collection and did not exclude any data. All manipulations, measures, and stimuli are reported in text or in Web Appendices A and B.

STUDY 1: ARCHIVAL PURCHASE DATA FROM A UNIVERSITY BOOKSTORE

In Study 1, we explored the proposed relationship between the justifiability of purchases and payment method choice by analyzing transactions at a university bookstore—a natural and

real-world purchase setting.

Table 1. Summary of Studies.

Study (N)	Study Context(s)	Key Analyses	Key Findings
1 (118,042 purchased items; 42,660 transactions)	University Bookstore	Correlational test of main effect	Hard-to-justify (easy-to-justify) items and transaction bundles are more likely to be purchased with cash (card)
2 (N = 200)	Purchasing Reiki	Causal test of main effect	When Reiki was hard-to-justify (easy- to-justify), it was more likely to be purchased with cash (card)
3A (N = 406)	Department of Motor Vehicles; Movie Theater; Pharmacy; Restaurant; University Bookstore	Causal test of main effect; Test for mediation	Hard-to-justify (easy-to-justify) purchases were more likely to be purchased with cash (card) because of the <i>purchaser's</i> desire to avoid recalling these purchases in the future
3B (N = 403)		Causal test of main effect; Test for mediation and alternative accounts (desire to keep merchants/credit card companies from seeing purchase)	
3C (N = 806)		Causal test of main effect; Test for mediation and alternative account (desire to keep others from seeing purchase)	
4 (N = 1,995)	Pharmacy	Test for manipulated- moderation; Test for measured-moderation	The moderating roles of (1) the trackability of card expenses and (2) consumers' idiosyncratic likelihood of recalling their card-spending
5 (N = 800)	Grocery Store Products from Thomas et al. (2011) Studies 2-4	Causal test of main effect; Replication of Thomas et al. (2011) effect	Payment Method Choice as DV (This Paper) Hard-to-justify (easy-to-justify) products are more likely to be purchased with cash (card) Payment Method Manipulated as IV (Thomas et al.) When assigned to pay with card (cash), consumers make more hard-to-justify purchases

Method

Dataset. We obtained transaction data from a large U.S. university bookstore before the COVID-19 pandemic. The data included every item purchased in-store for 43 straight days. We cleaned the dataset by removing non-pertinent purchases (e.g., county bag fees) and transactions that

were not made with cash or a debit or credit card (e.g., checks). This processing removed less than 4% of purchased items and the resulting dataset included 122,940 purchased items and 43,821 transactions, totaling \$2.8 million in sales.

Purchase category. To capture the content of these purchases, we scraped the bookstore website and assigned each item to the primary category associated with the item on the website. Overall, 8,647 of 13,237 (65%) unique items were automatically categorized this way. Next, we manually reviewed each item to (1) check the appropriateness of the automatic categorization and (2) assign remaining items to a category using the university bookstore’s categorization scheme (Web Appendix C: Table 1A). Last, to allow more heterogeneity within primary categories, three research assistants used a catalog provided by the bookstore manager to divide these categories into one of 58 subcategories (e.g., for Books, an item could be assigned to: Textbook, General Fiction Book, etc.). Web Appendix C (Table 1B) lists the 10 most frequently purchased subcategories. As the category of 1,829 items and the subcategory of 3,069 additional items was unknown, the final dataset contained 118,042 purchased items and 42,660 transactions.

Purchase justifiability. Next, we collected perceptions from 902 MTurkers ($M_{\text{age}} = 40$; 47% women) of how justifiable it would be to purchase an item from each category/subcategory. To alleviate survey fatigue, each participant imagined purchasing an item from 10 of the 58 subcategories (randomly selected), and responded to two scales measuring justifiability: “How justifiable is the decision to make this purchase?” (1 = *Not justifiable at all*; 9 = *Extremely justifiable*) and “How easy is it to defend making this purchase?” (1 = *Not easy at all*; 9 = *Extremely easy*; Study 4, Inman and Zeelenberg 2002).³ Responses to these two measures were highly correlated, $r = .89$, $p < .001$, and were averaged to create a composite measure of purchase justifiability. Web Appendix C (Table 1C) lists the 10 hardest-to-justify and easiest-to-justify subcategories.⁴

We merged these scores of purchase justifiability into the dataset. In addition, we computed both a simple average purchase justifiability score (weighing each item in a

³ Note these justifiability measures are *unipolar*. As such, “hard-to-justify” and “easy-to-justify” descriptors do not necessarily insinuate that a purchase is below or above the midpoint of this scale, just that the purchase is *relatively* harder or easier to justify.

⁴ In addition, we asked these participants about various emotions they would feel when making these purchases (e.g., guilt, shame). We reported all exploratory measures in Web Appendix A and exploratory analyses in Web Appendices D-G. A factor analysis of the two justifiability items and exploratory emotion items revealed two distinct factors: one comprises the two justifiability items and the other comprises the emotion items (Web Appendix D), supporting our use of the two justifiability items to measure purchase justifiability.

transaction/basket equally) and a weighted average purchase justifiability score (weighing each item in a transaction/basket by the item's cost, as more expensive items may matter more psychologically) to serve as robustness checks. Purchasing more high-justifiability products may compensate for the low-justifiability products in the basket, and so these two basket-based average scores depict the extent to which a customer may have considered the entire purchase as justifiable.

Results

Our key test was whether consumers' likelihood of using cash (card) was higher with products that were perceived as harder (easier) to justify, controlling for all other factors. We ran seven logistic regressions at the item-level with Cash (= 1) or Card (= 0) as the dependent variable and the purchase justifiability score of the item's subcategory as the independent variable. As shown in Figure 1 and Web Appendix C (Table 2A), regardless of the price range, the structure of the covariates, and random effects in the model, the pattern was highly consistent: The harder (easier) the purchase was to justify, the more likely the item was to be purchased with cash (card), $ps < .001$.

As a robustness check, we also examined whether this relationship replicates at the *transaction level* for the simple average and weighted average purchase justifiability scores. Replicating our findings on item-level data, the harder (easier) the transaction/basket was to justify, the more likely the transaction was made with cash (card), $ps < .001$ (Web Appendix C: Tables 2B-C).

Notably, another interesting variable discussed earlier that could affect purchase justifiability is whether the purchase is perceived to be a good deal by the customer ("transaction utility"; Thaler 1985). One proxy for this is whether (and the degree to which) an item was discounted, as discounted items should be perceived as more justifiable. Indeed, across every model (Web Appendix C: Tables 2A-C), greater discounts significantly predicted greater card use, $ps < .001$.

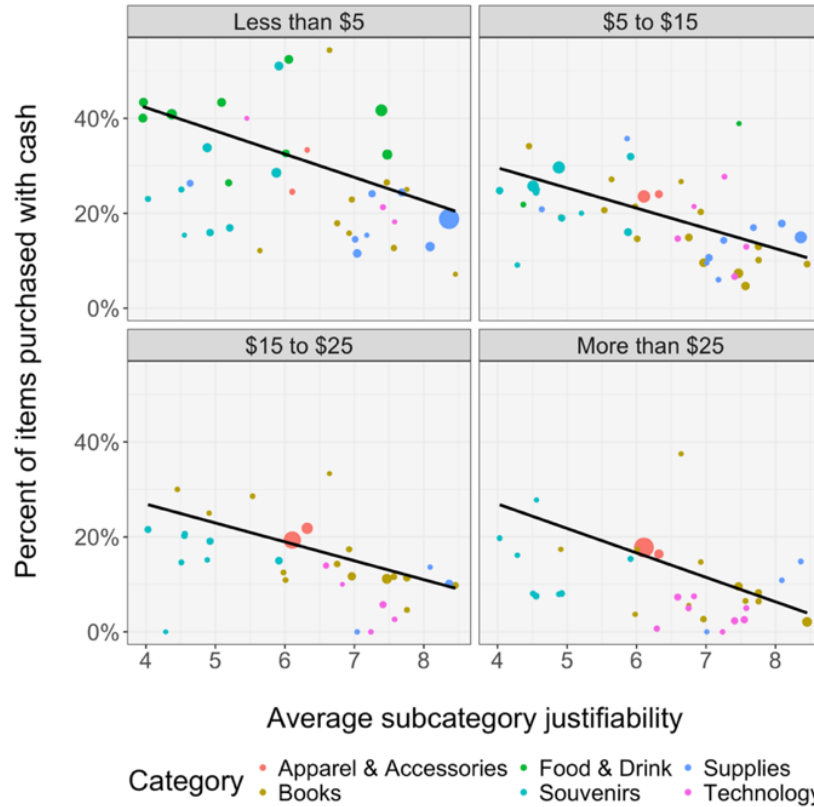


Figure 1. Use of Cash vs. Card by Purchase Justifiability in Each Price Category. Size of dot is proportional to the number of items purchased. For this figure, we eliminated any subcategories where the total number of items purchased was less than 10 and eliminated any specific transactions in which people purchased more than 10 items. These modifications are for visual clarity only; the analyses were always conducted using all subcategories.

Discussion

In Study 1, we analyzed over 100,000 real-world purchases and found that harder-to-justify purchases/transactions tended to be paid with cash, whereas easier-to-justify purchases/transactions tended to be paid with card. This pattern was robust across different price ranges (Figure 1; from less than \$5 to more than \$25)⁵ and control variables. In Study 2 and subsequent studies, we directly manipulated purchase justifiability to more cleanly capture the causal impact of purchase justifiability on payment method.

STUDY 2: MANIPULATING JUSTIFIABILITY OF A PURCHASE

Method

We recruited 200 individuals from Prolific ($M_{\text{age}} = 37$; 49% women) to participate in the

⁵ For analyses exploring price as a moderator, see Web Appendix E.

study. All participants imagined that they were purchasing a 30-minute session of Reiki for \$15. Half of the participants read that purchasing the session was justifiable (because they had been feeling anxious and depressed, their doctor recommended it, and they were purchasing the session from the hospital) and half of the participants read that purchasing the session was not justifiable (because they had not been feeling anxious and depressed, it was a spur-of-the-moment decision, and they were purchasing the session from the holistic healer). This approach was adopted from prior literature that similarly manipulated perceptions of an experiential purchase (e.g., the degree to which a massage is hedonic vs. utilitarian) by simultaneously changing several dimensions of the purchase's description (including purchase location, purpose, and presence of a doctor's recommendation; Rick, Cryder, and Loewenstein 2008) to ensure the manipulation's effectiveness.

To further ensure that participants read the stimuli carefully, participants spent a few moments reflecting on (i.e., writing about) why purchasing the session was personally justifiable or not justifiable for them. Then, on a subsequent page, participants reported how likely they were to use credit card or cash on a 6-point scale (1 = *Definitely cash*; 6 = *Definitely credit card*; reverse-coded in our analysis, such that higher values indicate a greater likelihood of choosing cash). At the end of the study participants rated the perceived justifiability of purchasing the 30-minute session of Reiki for \$15 on the same two 9-point justifiability measures ($r = .91, p < .001$) as in Study 1. These measures verified that purchasing Reiki when it was hard to justify ($M = 3.27, SD = 2.16$) felt significantly less justifiable than purchasing Reiki when it was easy to justify ($M = 7.57, SD = 2.04$), $b = -4.30, SE = 0.30, t(198) = -14.45, p < .001$.

Results

Payment method. A linear model of purchase justifiability condition (hard vs. easy) predicting payment method revealed that participants were significantly more likely to use cash instead of a credit card when purchasing Reiki was hard to justify ($M = 4.00, SD = 2.01$) compared to when purchasing Reiki was easy to justify ($M = 3.15, SD = 2.08$), $b = 0.85, SE = 0.29, t(198) = 2.92, p = .004$.

Discussion

Study 2 provided supportive evidence for the causal relationship between payment method and purchase justifiability—participants showed an increased preference to pay with cash (card) when purchasing Reiki felt less (more) justifiable.

STUDIES 3A-C: MOTIVATION TO FORGET HARD-TO-JUSTIFY PURCHASES

One important premise of our theory is that by paying with cash, consumers remove the paper/electronic trails that come with most card purchases and serve as memory cues for future retrieval, helping them to avoid recalling hard-to-justify purchases. In Studies 3A-C, we directly measured the desire to avoid recalling purchases to test this driving mechanism. We also tested three competing alternatives that might additionally or instead explain consumers' payment preferences.

Study 3A: Method

We recruited 406 MTurkers ($M_{\text{age}} = 39$; 47% women) to participate in the study. The study used a 2 (purchase justifiability: hard vs. easy) \times 5 (purchase environment) within-subject design. Each participant viewed 10 products that were sold in five different purchase environments: the Department of Motor Vehicles, a movie theater, a pharmacy, a restaurant, and a university bookstore. For each environment, we displayed two products (one at a time) that had the same price (between \$10 to \$30 depending on the environment) but differed in the extent to which they were justifiable. For example, the two products at the movie theater were a movie ticket (\$10, easy-to-justify condition) and a bucket of popcorn (\$10, hard-to-justify condition). In both cases a consumer would hand over an identical amount of money in the same purchase environment—the key difference was the justifiability of the purchase. A pretest using the same participant pool as the main study ($N = 199$) and the same two measures of justifiability as in previous studies ($r = .89, p < .001$) verified that the easy-to-justify purchases ($M = 7.27, SD = 2.00$) were indeed perceived as more justifiable, $b = 2.21, SE = 0.09, t = 25.61, p < .001$, than the hard-to-justify purchases ($M = 5.05, SD = 2.55$).

The 10 purchases appeared one at a time in random order (i.e., purchases from the same environment were not grouped together). Participants were told to consider each purchase independently and as if the others had never occurred. Participants imagined that they had a debit card and \$40 cash in their wallet and indicated how likely they were to use debit card or cash for each purchase on a 7-point bipolar scale. After participants indicated their preferred payment method, they additionally reported the extent to which they were open to remembering vs. wanted to avoid remembering this purchase on a 7-point scale, with higher values indicating

greater desire to avoid remembering the purchase.⁶

Study 3A: Results

We tested whether the effect of the purchase justifiability manipulation on the preference for using cash (vs. card) was driven by the desire to avoid recalling the purchase (vs. being open to remember the purchase) using a structural equation model, clustering by participant and purchase environment (Oberski 2014; Rosseel 2012). As hypothesized, this analysis revealed a significant mediational pathway (indirect effect [IDE]: $b = 0.12$, $SE = 0.04$, $z = 3.57$, $p < .001$; Figure 2), such that hard-to-justify (easy-to-justify) purchases induced a greater desire to avoid recalling the purchase in the future, which in turn led to a greater likelihood of using cash (card).

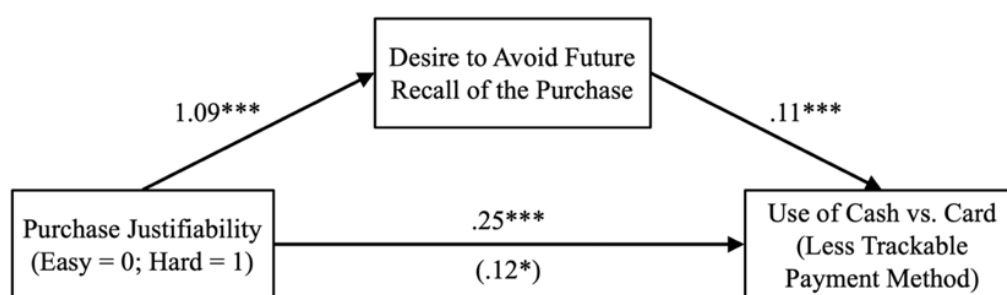


Figure 2. Mediation Analysis for Study 3A. Path coefficients are unstandardized betas. Value in parentheses is the direct effect when controlling for the mediator. * $p < .05$ ** $p < .01$ *** $p < .001$

Study 3B: Method

Study 3B ($N = 403$; $M_{\text{age}} = 41$; 46% women) was a replication of Study 3A except that after participants indicated their preferred payment method, they additionally reported the extent to which they were open to seeing vs. wanted to avoid seeing a record of the purchase, the extent to which they wanted to keep their credit card company from seeing a record of the purchase, and the extent to which they wanted to keep the merchant from seeing a record of the purchase on 7-point scales with higher values indicating greater desire to avoid seeing a record and keep their credit card company/merchant from seeing a record of the purchase.⁷

Study 3B: Results

Although hard-to-justify (vs. easy-to-justify) purchases induced greater interest in

⁶ In addition, we asked participants about how guilty they would feel when making these purchases (Web Appendix A). See Web Appendix G for exploratory analyses on guilt.

⁷ We slightly modified the mechanism measure in this experiment to show the robustness of this mediation and to make this measure more consistent with our alternative mechanism measures assessing participants' desire to keep the credit card company and merchant from seeing the purchase. We also measured frequency of participants' credit card usage (Srivastava and Raghurir 2008). All results reported in Study 3B were robust when controlling for participants' frequency of card usage (Web Appendix F shows these robustness checks).

keeping the credit card company from seeing a record of the purchase, $b = 0.17$, $SE = 0.03$, $t = 6.10$, $p < .001$, and keeping the merchant from seeing a record of the purchase, $b = 0.17$, $SE = 0.03$, $t = 6.16$, $p < .001$, neither the “credit card company” mediational path (IDE: $z = 1.59$, $p = .112$) nor the “merchant” mediational path was significant (IDE: $z = -0.09$, $p = .926$) when each measure was entered as a simultaneous parallel mediator. In each parallel-mediator model, we replicated the significant mediational path shown in Study 3A, such that hard-to-justify (easy-to-justify) purchases induced a greater desire for consumers to avoid seeing a record of the purchase in the future, leading to a greater likelihood of using cash (card), IDEs: $bs > 0.11$, $zs > 5.38$, $ps < .001$ (Web Appendix C: Figures 1A-B).

Study 3C: Method

Study 3C (806 MTurkers; $M_{age} = 37$; 41% women) was identical to Study 3B except that we 1) asked about participants’ *own* openness to seeing (vs. *own* interest in not seeing) a record of each purchase as well as their openness to *others* seeing (vs. interest in keeping *others* from seeing) a record of each purchase and 2) added a filler task, which was placed between measures capturing participants’ payment method choices and these mechanism measures.

Study 3C: Results

Although hard-to-justify (vs. easy-to-justify) purchases induced greater interest in keeping others from seeing a record of the purchase, $b = 0.52$, $SE = 0.03$, $t = 20.51$, $p < .001$, this “others” mediational path was not significant (IDE: $b = -0.03$, $SE = 0.02$, $z = -1.60$, $p = .109$) when entered as a simultaneous parallel mediator, whereas the proposed “self” mediational path remained significant as in prior studies (IDE: $b = 0.08$, $SE = 0.02$, $z = 4.26$, $p < .001$; Web Appendix C: Figure 2).

Studies 3A-C: Discussion

Studies 3A-C showed that consumers’ preference to pay with cash (card) increased when the purchase they made was less (more) justifiable, and this preference was most strongly explained by *their own* desire to avoid recalling hard-to-justify purchases in the future.

STUDY 4: MODERATION BY CARD TRACKABILITY AND IDIOSYNCRATIC DIFFERENCES IN RECALL

In Study 4, we provided additional evidence for the proposed mechanism of avoiding future recall through two types of moderation approaches. First, we directly manipulated the trackability of the card that would be used for the purchase. If a desire to avoid recalling

purchases drives consumers' preference for cash, then the effect of purchase justifiability on preference for cash vs. card should manifest only when the expenses made on the card are trackable. As a second test of the proposed mechanism, we measured idiosyncratic differences in consumers' expectations of whether they would recall their trackable card purchases. We expect the hypothesized effect to manifest for consumers who expect to recall their trackable card expenses and to be reduced among those who are unlikely to do so.

Method

We recruited 1,995 MTurkers ($M_{\text{age}} = 36$; 50% women) to participate in the study. We aimed for a larger sample size than in prior studies because this study used a between-subjects design and tested for two separate moderations (Simonsohn 2014).

The study employed a 2 (purchase justifiability: hard vs. easy) \times 2 (card type: trackable vs. not-trackable) between-subjects design. All participants were presented with two \$10 items from a pharmacy and chose one product to buy. We manipulated whether the two products in the choice set were easy or hard to justify: Participants in the hard-to-justify condition chose between spending \$10 on a party-size bag of regular M&Ms and spending \$10 on a party-size bag of peanut M&Ms, and those in the easy-to-justify condition chose between spending \$10 on 300 Advil pain reliever tablets or spending \$10 on 300 Bayer pain reliever tablets. A pretest using the same participant pool as the main study ($N = 199$) and justifiability measures as prior studies ($r = .92, p < .001$) verified that the hard-to-justify items ($M = 5.53, SD = 2.49$) were perceived as less justifiable than the easy-to-justify items ($M = 7.77, SD = 1.26$), $b = -2.24, SE = 0.28, t = -8.04, p < .001$.

The key dependent measure was the payment method participants chose to complete their purchase. On the page on which this decision was made, we manipulated the trackability of the card option—half the participants were informed they had “a \$20 bill and a Visa Debit Card (with a balance of greater than \$10 on it),” the other half were informed they had “a \$20 bill and a Prepaid Visa Debit Card (with a balance of greater than \$10 on it).” The payment page included a description to ensure consistent understanding: Whereas the former Visa debit card was described as being connected to participants' main bank account (just like regular debit cards they would own) and participants would see a record of this purchase on their bank statement, the latter prepaid Visa debit card was described as not connected to participants' main bank account (just like regular prepaid cards in the marketplace) and participants would not see a

record of this purchase on their bank statement. Participants reported their likelihood of using cash or a debit card for the purchase on a 7-point scale (1 = *Definitely [prepaid] debit card*; 7 = *Definitely cash*). Last, as a manipulation check for card type (i.e., its trackability), participants reported how likely they would be to recall making their purchase at a later date if they were to use the debit card (1 = *Not likely at all*; 7 = *Extremely likely*).⁸

Results

Manipulation check of card trackability. A linear regression on the measured likelihood of recalling the purchase by card type (trackable vs. not-trackable) verified that the Visa debit card ($M = 5.31$, $SD = 1.76$) was indeed perceived as more likely to lead to future recall of the purchase compared to the prepaid Visa debit card ($M = 4.21$, $SD = 1.97$), $b = 1.10$, $SE = 0.08$, $t(1993) = 13.12$, $p < .001$. There was no effect of purchase justifiability, $t(1993) = 0.28$, $p = .780$, or Card Type \times Purchase Justifiability interaction, $t(1991) = 0.19$, $p = .853$.

Card trackability moderation. We conducted a linear regression on payment method with purchase justifiability (hard vs. easy), card type (trackable vs. not-trackable), and their interaction as predictors. We found a significant Card Type \times Purchase Justifiability interaction, $b = 0.52$, $SE = 0.21$, $t(1991) = 2.44$, $p = .015$ (Figure 3: Top Panel). Among participants who had a trackable debit card and cash in their wallets, we replicated the effect observed in previous studies such that participants were significantly more likely to choose cash when the purchase was hard to justify ($M = 4.08$, $SD = 2.36$) compared to when the purchase was easy to justify ($M = 3.71$, $SD = 2.43$), $b = 0.37$, $SE = 0.15$, $t(1991) = 2.46$, $p = .014$. In contrast, among participants who had a not-trackable debit card and cash in their wallets, there was no effect of purchase justifiability on payment method (hard-to-justify: $M = 3.45$, $SD = 2.34$; easy-to-justify: $M = 3.59$, $SD = 2.40$), $t(1991) = -0.98$, $p = .329$.

Idiosyncratic differences moderation. Since the card trackability manipulation check was successful, we made participants in the not-trackable card conditions perceive that paying with card would be less effective at creating a retrieval cue. Additionally, we can leverage this manipulation check to conduct a second test of our proposed mechanism. For participants assigned to the trackable card (i.e., regular debit card) conditions, there exists idiosyncratic differences in consumers' likelihood of tracking and recalling debit card purchases. Consistent

⁸ In addition, we asked participants about how guilty they would feel when making these purchases (Web Appendix A). See Web Appendix G for exploratory analyses on guilt.

with our proposed mechanism, a linear regression on payment method with purchase justifiability (hard vs. easy), likelihood of recalling a purchase made on the (trackable) debit card, and their interaction as predictors revealed a significant Likelihood of Recall \times Purchase Justifiability interaction, $b = 0.25$, $SE = 0.09$, $t(975) = 2.93$, $p = .004$ (Figure 3: Bottom Panel). Floodlight analyses revealed that the effect of purchase justifiability on payment choice was significant ($p < .05$) for participants whose measured likelihood of recalling their debit card expenses ($M = 5.31$; $SD = 1.76$) was above 5.03 and was not significant below this value.

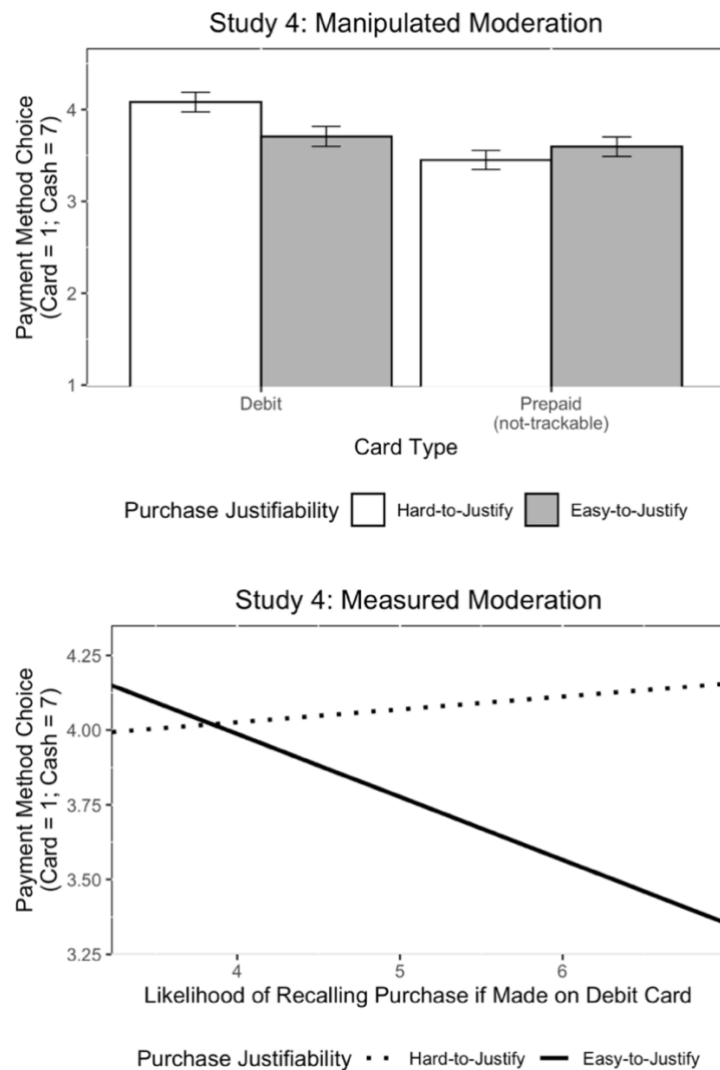


Figure 3. Top Panel: Choice of Cash (vs. Card) by Card Type and Purchase Justifiability in Study 4 (manipulated moderation results). Error bars indicate standard errors. **Bottom Panel:** Choice of Cash (vs. Card) for Participants in the Trackable Debit Card Condition by Likelihood of Recalling Debit Card Purchases and Purchase Justifiability in Study 4 (measured moderation results).

Discussion

Study 4 provided both manipulated- and measured-moderation evidence for our proposed mechanism. First, when the trackability of the card is removed, the effect of purchase justifiability on payment method preference was attenuated. Second, within the trackable debit card condition, consumers who were more likely to recall purchases made on their card were more likely to exhibit the hypothesized effect.

STUDY 5: RECONCILING WITH MODE-OF-PAYMENT EFFECTS

As mentioned in the introduction, this paper is the first to our knowledge that systematically explores how consumers *choose* between multiple payment methods (i.e., studying payment methods as a dependent variable). Our work complements a substantial consumer behavior literature that studies payment methods as an independent variable, such as classic studies showing that when consumers are assigned or primed to pay with cash (vs. card), they experience greater pain (Raghubir and Srivastava 2008; Shah et al. 2016; Thomas et al. 2011). Perhaps the most relevant finding in this domain to the present research comes from Thomas et al. (2011), who find that when consumers are assigned to pay with card (vs. cash), they make more hard-to-justify (i.e., vice) purchases; orthogonal and complimenting this finding, we show that when consumers first make purchase decisions and then choose between cash and card, they prefer to pay with cash when their basket skews toward having more hard-to-justify purchases. In Study 5, we sought to demonstrate both effects using stimuli from Thomas et al. (2011), Studies 2-4.

Method

We recruited 800 individuals from Prolific ($M_{\text{age}} = 36$; 50% women) to participate in the study. Participants were first randomly assigned to our paradigm ($n = 399$; payment method as DV) or the Thomas et al. (2011) paradigm ($n = 401$; payment method assigned as IV). Adopting the stimuli from Studies 2-4 in Thomas et al. (2011) and conceptually replicating the procedure, participants assigned to the Thomas et al.'s paradigm were either informed that the store they were visiting only accepted cash or credit card, saw either 10 hard-to-justify (“vice”) products or 10 easy-to-justify (“virtue”) products, and chose whether they would add each product to their shopping cart (i.e., amount spent as DV). Keeping the total number of products viewed the same, participants assigned to our paradigm also encountered 10 products from Thomas et al. (2011) Studies 2-4 (half were hard-to-justify and half were easy-to-justify); following our studies’

procedure, participants reported whether they would pay cash or credit card for each product (a dichotomous payment method choice DV). A pretest ($N = 101$) using the same two measures of justifiability ($r = .89, p < .001$) verified that the hard-to-justify (“vice”) products ($M = 4.24, SD = 2.18$) were perceived as less justifiable than the easy-to-justify (“virtue”) products ($M = 5.48, SD = 2.32$), $b = -1.20, SE = 0.33, t = -3.64, p = .002$.

Results

Payment method as DV (our paradigm). A logistic mixed-effects model predicting payment method choice with the purchase type manipulation (hard-to-justify vs. easy-to-justify) as a fixed effect and participant and stimulus as random effects again revealed that participants were more likely to use cash instead of a debit card for the hard-to-justify items (45.8%) compared to the easy-to-justify items (39.7%), $b = 1.88, SE = 0.55, z = 3.43, p < .001$ (Figure 4).

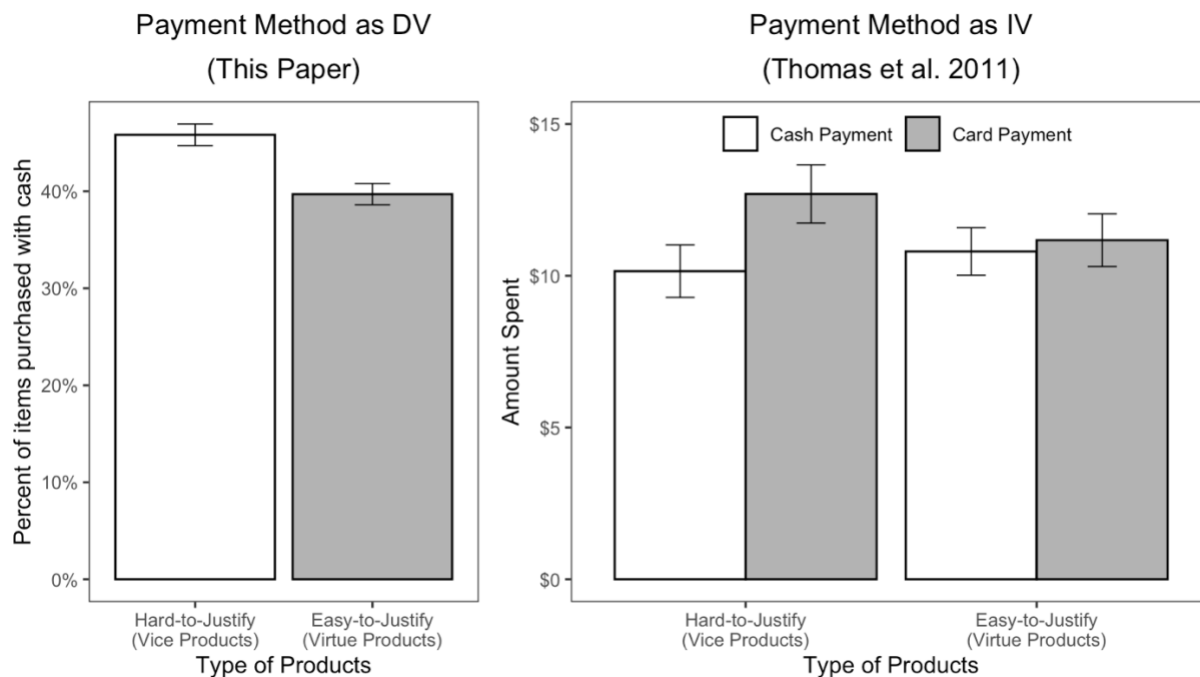


Figure 4. Left Panel: Choice of Cash (vs. Card) by Product Type in Study 5 (our paradigm). **Right Panel:** Amount Spent by Product Type and Assigned Payment Method in Study 5 (Thomas et al.’s paradigm). Error bars indicate standard errors.

Payment method as IV (Thomas et al.’s paradigm). To replicate Thomas et al.’s findings, we conducted a linear regression on Amount Spent (log transformed) with purchase type (hard-to-justify vs. easy-to-justify), payment method (cash vs. credit card), and their interaction as

predictors. The interaction approached significance and the pattern replicated prior work, $b = -0.33$, $SE = 0.22$, $t(397) = 31.55$, $p = .122$ (Figure 4). Participants seeing the 10 hard-to-justify (“vice”) products tended to spend more when assigned to purchase with card, $b = 0.29$, $SE = 0.15$, $t(397) = 1.95$, $p = .052$. Also replicating Thomas et al.’s findings, this effect did not exist among participants seeing 10 easy-to-justify (“virtue”) products, $t(397) = -0.31$, $p = .760$.

Discussion

Study 5 used stimuli from prior work to show that when consumers first make purchase decisions and then choose between cash and card, their preference to pay with cash increases for hard-to-justify purchases. In contrast, when consumers are assigned to pay with card (vs. cash) and then decide what to buy, they make more hard-to-justify purchases when paying with card (consistent with prior work on the pain-of-paying effect).

GENERAL DISCUSSION

Converging evidence from an analysis of over 100,000 real-world purchases and six experiments shows that when consumers are motivated to forget (vs. remember) a purchase because they see the purchase as difficult (vs. easy) to justify, they have an increased preference to pay with cash (vs. card). This effect generalizes across different dependent variables (dichotomous choice and continuous scales), purchases, locations, populations (university bookstore shoppers and online adult panels), and product prices (below \$5 and above \$25 in Study 1; between \$10 to \$30 in Studies 3A-C).⁹

Theoretical Contribution and Future Research

We outline why the trackability of a payment method can affect how a consumer chooses to pay and uncover a unique strategy that consumers employ when they seek to forget their purchases. Our research merges past literature on payment methods, purchase justifiability, and motivated memory, and extends each area.

Payment method. Our finding that payment trackability drives consumers’ payment method choices is important considering the rapid growth of financial technology industries in which tracking behaviors are widely encouraged (Ülkümen and Cheema 2011). Our research brings the growing popularity of financial tracking into consideration and tests how the strategic

⁹ We recognize that most of our stimuli center on low or moderate priced items and may not apply to high priced items (e.g., a sports car or a diamond ring) that consumers cannot physically carry enough cash to pay for or that consumers might want to track no matter how unjustified the item is.

management of retrieval cues can affect consumers' payment choices.

Our work complements a substantial consumer behavior literature that studies the effects of using different payment methods (i.e., payment methods as IVs rather than DVs). In Study 5 we show how these two causal relationships can stay distinct. We also suspect that both patterns can be observed in secondary, correlational data depending on the shopping context. For instance, in Study 1 of Thomas et al. (2011), they find that credit card use is correlated with making more hard-to-justify purchases in a dataset of grocery store transactions. Because grocery stores are establishments that consumers visit routinely, many consumers might habitually use a specific payment method and have this payment method in mind when selecting products. In contrast, many consumers in our university bookstore transaction dataset (Study 1) may be passing through campus for the first time or making a one-off purchase and do not have an established payment method in mind for this context, which could be why our dataset shows that hard-to-justify purchases tend to be made with cash. These distinct patterns (observed both in correlational datasets and controlled experiments) offer rich opportunities for future research to explore other moderators rendering one pattern more dominant. For instance, perhaps financially savvy consumers tend to decide their payment method before entering a store if they know what merchant transactions give them the most credit card rewards; perhaps when traveling overseas, consumers tend to keep both cash and card accessible because of the uncertainty of the payment methods that retailers accept or the payment methods that will be more appropriate when checking out.

Relatedly, our work also evokes questions about the relative strength of our motivated memory process versus the anticipated pain of payment when it comes to choosing payment methods. Our evidence suggests that when consumers decide a purchase first and have the option of different payment methods, their desire to forget hard-to-justify purchases can outweigh their anticipated (but not experienced) pain of payment in driving how they pay. We encourage future research to more directly capture experienced versus anticipated pain of payment along with motivated memory, and to explore how the interplay of these mechanisms contributes to consumers' payment choice and their shopping experience.

Purchase justifiability. As financial tracking becomes more popular, we believe that more research studying the facilitators and inhibitors of this behavior is needed. The current work sheds light on one such variable—purchase justifiability. We encourage future research to further

examine what makes a purchase justifiable and whether different sources of purchase justifiability may increase or decrease tracking. As mentioned, hard-to-justify purchases could have a variety of properties (e.g., less durable, more hedonic, low transaction utility) and can induce one or multiple emotions like anger, anxiety, embarrassment, and guilt. We view properties like durability as factors that affect consumers' holistic assessment of purchase justifiability—the more durable the purchase is, the more justifiable the purchase might seem (correlation between durability/duration and justifiability in Study 1: $r = .42$). The totality of our empirical package suggests that consumers are more likely to pay with cash for hard-to-justify purchases, and while durability can be a contributing factor to this perception, this effect can manifest even for nondurable purchases (e.g., the experiential Reiki purchase in Study 2).

Similarly, exploratory analyses of Study 1 data revealed that multiple emotions could be associated with these purchases and that guilt (also measured in Studies 3A and 4) might be particularly relevant in some, but not all, of our study contexts (see Web Appendix G for exploratory analyses). Future research diving deeper into various emotions elicited by different purchase situations and product types will provide valuable insights for understanding how consumers manage payment methods to remember and to forget. This work could include examining the relative strength of each property/emotion contributing to purchase justifiability (guilt, regret, transaction utility, etc.) in various contexts to help marketers predict what purchases will be hard to justify and more likely to be purchased with cash.

Also, one question that might arise is whether our effect is primarily driven by the “easy-to-justify” or “hard-to-justify” purchases relative to a potential “control/baseline.” This is an interesting yet challenging question to answer because 1) it artificially imposes a categorical structure onto a continuous, unipolar construct (purchase justifiability, from not justifiable at all to extremely justifiable), and 2) oftentimes the control/baseline purchase (i.e., a purchase without additional information) is in and of itself hard to justify (e.g., Oreos in Study 5) or easy to justify (e.g., pain relievers in Study 4), rendering such comparisons unfeasible. Our primary interest is to show that *shifting* perceptions of purchase justifiability up or down by manipulating specific descriptions of the same purchase (e.g., Study 2) or by changing the purchase content (e.g., Study 4) consistently affects payment choices. We hope this research inspires future work to further explore how the malleability of purchase justifiability may change across different types of products (e.g., physical vs. experiential purchases), different purchase timing and locations, as

well as different consumer segments (e.g., price may shift purchase justifiability to a greater degree for consumers with fewer financial resources).

Motivated memory. This work also enriches the discussion on motivated memory. Prior research on remembering tends to focus on the strategies that consumers employ to better cue and retrieve sentimental memories (Zauberman et al. 2009). Prior research on motivated forgetting/avoidance often focuses on the domain of morality and self-regulation (Ehrich and Irwin 2005; Huang 2018; Reczek et al. 2018; Woolley and Risen 2021). We enrich these findings by demonstrating financial actions that consumers can take to remove retrieval cues and avoid remembering certain purchases.

In Studies 3B-C we assessed the possibility of whether a desire to hide purchases from credit card companies, merchants, and others can additionally influence payment choice (and potentially lead to financial infidelity; Garbinsky et al. 2020). These studies showed that participants' preference for using card or cash in our studies is primarily driven by *their own desire* to avoid recalling these purchases. The nonsignificant "others" mediational path may result from three reasons. First, this study may be underpowered to detect this indirect effect. Second, this study did not specifically recruit consumers who were in a relationship, so it is possible that some participants had no one to hide the purchase from or had difficulty imagining such scenario.¹⁰ Third, we held constant the purchase environment in these studies. Because all purchases made at a given environment tend to show the same purchase record (e.g., the store's name), the only consumers who can recall the specific item(s) purchased with card (and the justifiability of these items) are the purchasers themselves. We encourage future work to explore when, how, and why the presence of others, and the closeness of others, can affect consumers' choice of less trackable payment methods. For instance, there may be other shopping contexts where purchase environment directly signals justifiability.

We also encourage future research distinguishing between various aspects of the purchase that consumers may wish to forget (e.g., product-related vs. price-related) and examining when certain aspects are more dominant in driving motivated forgetting. Our data in Studies 3A-C and Supplemental Study does not speak to the specific aspects consumers desire to

¹⁰ Note that our hypothesized effect and mediational pathway persist when the sample is restricted to participants who are single (Supplemental Study in Web Appendix H), increasing our confidence that consumers *themselves* are motivated to forget hard-to-justify purchases which drives the use of cash for these purchases.

forget the most, but we speculate that the specific aspects that make a purchase unjustifiable would be the ones that consumers want to forget the most.

Implications for Merchants, Consumers, and Financial Institutions

Understanding the payment methods consumers choose has important implications and generates new questions for merchants, consumers, and financial institutions. For instance, our findings shed light on the type of payment methods merchants might consider providing for consumers, depending on the products they sell (and the context they sell them in) to match consumer preferences. A logical next step for future research would be to assess whether and how improving this match can have downstream consequences for merchants (e.g., on sales). From a consumer welfare perspective, our data suggest that budgeting/tracking apps like Mint may encourage consumers to *proactively* use cash to “forget” their hard-to-justify purchases; future research might test whether a consequence of this is that consumers also *retrospectively* believe they spend less on hard-to-justify purchases than they actually do.

Additionally, consumers face the decision of whether to use cash or a card daily. Although consumers often benefit from using cards (e.g., they can track spending/purchases and receive rewards), consumers can also benefit from using cash because this payment method permits them to strategically “forget” certain purchases. While the world’s gradual transition to a cashless society might eliminate consumers’ ability to use cash for this purpose, we expect that different payment methods that satisfy this psychological need will be created and adopted in the future, such as less trackable cryptocurrencies. In this light our findings provide valuable insights for fin-tech companies, especially as payment methods become more diverse and some payment methods (e.g., Apple Pay) have similar trackable properties to cards whereas other methods (e.g., some cryptocurrencies; Marinos 2016) are less trackable like cash. We see this area as a promising and critical one for future research, given the ever-increasing pace of technological change in the domain of financial decision-making.

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