The Origin of the Pain of Paying

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We examine the pain of paying construct and its underlying mechanism. Across several studies we find that making psychological pain more salient, versus physical pain or control, decreases willingness-to-pay for products supporting the idea that the pain of paying is literally a pain, albeit a psychological one.

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namely the costs associated with the item for purchase. This is the central question of this paper. In particular, we investigated whether the representation of costs in the brain differ between abstract costs (e.g. paying money) or somatosensory costs (e.g. tolerating electric shocks) that are matched in economic value.

Consumer behavior theories have suggested that consumers consider abstract monetary prices as a potential loss that triggers a negative affective response that resembles the emotional or psychological components of pain processing (so-called “pain of paying”), see (Prelec and Loewenstein, 1998, Rick et al., 2008). A recent neuromaging study found that when subjects decide to buy, areas of the brain that are known to represent the sensation of physical (but not psychological) pain - the Insula - are less activated as compared to when subjects decide not to buy (Knutson et al., 2007). These results suggested that the act of paying does physically “hurt” when prices are perceived as too high, i.e. it triggers a physical pain sensation. However, these results were based on inverse inferences about the Insula as their study did not allow for comparing the act of paying with the experience of physical pain. Given that the Insula is a highly interconnected brain area that has also been found to be involved in various other mental processes important for consumer decision-making, the current findings are inconclusive. Our paper addresses these shortcomings and provides a direct test of the physical pain of paying hypothesis.

We investigated the neural basis of cost computations by scanning hungry subjects’ brains (N=21, aged 18-35, mean 23.65 years) while making 280 purchasing decisions for liked food items. Subjects could either pay in monetary units ($0-$1.50) or in subjectively equivalent physical pain units (electric shocks). Several days before the fMRI experiment, we performed a calibration of each individual’s subjective pain tolerance levels in which we matched their pain tolerance to monetary values using a BDM auction mechanism (Becker, DeGroot, and Marschak, 1964). Because of the characteristics of this auction, we can assume that in that pre-screening study individuals bid their ‘true’ utility for the right to avoid receiving an electric shock of different intensities (Wertenbroch and Skiera, 2002). During a second pre-scanning task, subjects underwent another BDM task, this time to sample subjects’ willingness-to-pay (WTP) for the 40 different food items. The fMRI task consisted of two different, within-subject trial types: Trials in which subjects could decide to buy 40 food items at four different monetary prices ($0, $0.50, $1.00, $1.50) (=160 ‘$ trials’) and trials in which they could decide to buy the same 40 food items for tolerating pain (electric shock) at three different pain intensities (=120 ‘V trials’) that were matched with the three different non-zero monetary prices.

For the behavioral data analysis of the main study, we created dummy variables for WTP and purchasing prices in money and physical pain trials and entered them into a mixed effects logistic regression analysis. The model was significant (Wald $\chi^2(2)=1222.23$, $DF=22$, $p<.000$) and had significant regression coefficients for each predictor ($\beta_{\text{WTP}}=3.31$, $p<.000$; $\beta_{\text{price}}=3.68$, $p<.000$; $\beta_{\text{pain}}=-2.69$, $p<.000$; $\beta_{\text{somato}}=-2.52$, $p<.000$). We tested differences in the regression coefficients between WTP and price predictors in each trial (money or shock) type and found significant differences for WTP and price in both, money and voltage trials (both $p<.000$). We also tested differences in the regression coefficients between money and voltage trials for WTP and price predictors and found no significant differences between trial type (price vs. price; $p<.216$; WTP vs. WTP; $p<.00$). For the fMRI data analysis we estimated a hierarchical mixed effect GLM to investigate differences and overlaps for brain areas that correlated with the size of monetary and physical pain costs. We found that the Insula, a region involved in physical pain processing, correlated positively with the size of physical pain prices, but not with the size of monetary prices ($p<.005$, uncorr.). A conjunction analysis revealed that no overlapping areas can be found ($p<.005$, uncorr.).

Taken together, these results show that while people’s brains react differently to “monetary” and “physical pain” their behavior does not. Our fMRI results suggest that paying with money might trigger very different processes than those involved with more “physical” forms of costs. We suggest that the act of paying recruits systems involved in psychological rather than physical pain processing. These results call into question the current findings in the neuroscientific literature: That is, our findings call into question that for everyday consumption decisions paying triggers a similar sensation as suffering physical pain. Our results have important implications for disadvantageous decision-making such as overspending and transformative consumer research.

The Origin of the Pain of Paying

EXTENDED ABSTRACT

In our daily lives we are continuously faced with the decision of whether or not to buy different goods and services. As research from behavioral economics suggests, when purchasing a product, people experience hedonic competition between the anticipated pleasure derived from acquiring and consuming the product and the anticipated losses incurred not only from the money given up in the transaction (product price) and the hassle of executing the payment (transaction cost) but also from pain of paying, the disutility derived parting with money (Prelec & Loewenstein, 1998). It is the trade off between these anticipated gains and losses that determines the decision of whether or not to purchase. Interestingly, however, our understanding of the pain of paying construct is still inconclusive.

Early findings from judgment and decision making, in support of the pain of paying, demonstrated that people like to prepay for purchases and decouple spending from consumption (Prelec & Lowenstein, 1998). Recent findings from neuroeconomics (Knutson et al., 2007) went further and showed that a decision to purchase activated not only brain areas involved in reward processing (Nucleus Accumbens) but also deactivated brain areas (in particular the anterior Insula) that have been linked not only to physical pain but also to arousal (i.e. disgust and anxiety). The current research extends these previous findings and seeks to provide a better understanding of what the pain of paying is: how is it experienced and what is driving it.

One of the biggest unknowns that the current paper is focusing on is whether the pain of paying is in fact experienced as a physical pain, psychological pain, or whether it is not experienced as a pain at all. To address this question, as a first step we examined whether making pain more salient would influence consumer’s willingness-to-pay for products, and if so, which types of pain would have an influence. In Study 1 participants were primed, using a scrambled sentence task, with either psychological pain related words (e.g., sorrow, grief, heartbeat), physical pain related words (e.g., aching, sore, cramps), or neutral words (e.g., pen, ball, carpet). Participants were then given the opportunity to purchase a box of Godiva chocolates for real with their own money. They provided their willingness-to-pay (WTP) using a choice-based Becker-DeGroot-Marschak (BDM) auction (Becker, DeGroot & Marschak, 1964); a pre-test confirmed that only participants that understood the BDM auction procedure proceeded to this task. Finally, participants completed liking, mood, and arousal measures. Our findings indicate that participants primed with psychological pain-related words were willing to
pay significantly less for the chocolates as compared to participants primed with neutral words or with physical pain-related words (there was no significant difference between the latter two conditions), and these differences were not driven by how much participants liked the chocolates, their mood, or their arousal (those measures were not statistically different across conditions).

Study 2 extended these results by looking at how making pain more salient would influence consumer’s willingness-to-pay for a non-hedonic product with a clear and known face value: a $20 Amazon.com gift card. Similar to the first study participants were primed with either psychological pain-related words, physical pain-related words, or neutral words. They then provided their WTP for the Amazon.com gift card through a choice-based BDM auction (a pre-test confirmed that only participants that understood the BDM auction-procedure proceeded to this task). Finally, they completed liking, mood, and arousal measures. Again, we found that participants primed with psychological pain-related words were willing to pay significantly less as compared to participants primed with neutral words or with physical pain-related words, and these differences were neither driven by how much participants liked the gift card nor by participants’ mood or arousal.

Study 1 and Study 2 provide support for the idea that the pain of paying might be experienced as a pain that is similar to psychological rather than physical pain. However, the support is indirect, as we did not directly manipulate participants’ experience of pain while purchasing (if it exists). Instead our primes simply made pain-related concepts more salient. Furthermore, if there exists a pain of paying, making people less sensitive to it, should increase WTP. We are currently running a third study to address these two points. In particular, in Study 3, participants are given a placebo pill disguised as either a drug that decreases sensitivity to pain (either physical or psychological), a drug that increases sensitivity to pain (either physical or psychological), or a vitamin supplement (control). That is, we have five-between subjects-conditions. After taking the “medication”, participants are given a series of tasks; including a purchasing task as well as a number of manipulation checks. We predict that participants who believe they have consumed a psychological pain-relieving drug will be willing to pay significantly more than participants in the other conditions, while participants given a psychological pain-enhancing drug will be willing to pay significantly less. We predict no differences in willingness-to-pay between the control and physical pain drug conditions. We expect this study to be completed by the time of the ACR conference.

Habitually Consistent, Contextually Inconsistent: Dispositional and Contextual Determinants of Financial Decisions

EXTENDED ABSTRACT

The changes in the financial services industry have expanded access to loans for the vast majority of consumers. The easy availability of loans has helped consumers to improve their quality of life and has catalyzed economic growth. However, this easy availability of loans also presents some challenges; it requires consumers to be more careful in managing their loan repayments. Not all consumers seem to be good at this. Some consumers fall into a debt trap and spend a large proportion of their income paying interest on their loans. One way consumers can reduce their interest burden is by using their disposable income to prepay (i.e., paying ahead of schedule) their loans. The present research was conceived to understand the factors that predict consumers’ loan prepayment behaviors. Specifically, in this research we try to address the question: how do consumers decide whether to use their disposable income (e.g., a bonus) to prepay a loan or to use it for other purposes?

In this paper, we present two seemingly contradictory hypotheses that offer insights into how people decide whether or not to reduce their debts by prepaying their loans. The first hypothesis, the dispositional orientation hypothesis, posits that financial decisions are influenced by the pain of payment experienced by people. Money activates distinct cognitive and emotional responses in tightwads and spendthrifts. Tightwads relish saving money; so they are always willing to forego their current consumption to save money by prepaying their loans. Spendthrifts do not relish saving as much; they would rather have disposable cash in hand than prepay their loans. It is this difference in habitual response towards money (rather than economic valuations of financial gains) that causes the individual difference in financial management.

The second hypothesis, the domain specificity hypothesis, posits that the effects of dispositional orientation are restricted to monetary framing of options. Dispositional responses to money are less likely to manifest when financial gains are presented in (economically equivalent) non-monetary units. The notion that individuals differ in the way they spend and save money is not new; the subjective utility model, which is the bedrock of homo economicus’ decision making, assumes that people map financial gains onto stable utility functions and people have different utility functions. However, the subjective utility model and the pain of payment model differ on one important aspect – domain specificity. Subjective utility model implies domain invariance of financial gains; that is, equivalent representations of gains should evoke the same responses from decision makers. In contrast, the pain of payment model proposes that tightwads and spendthrifts will differ in their decisions when a financial gain is presented in a monetary frame (dollars), but not when the same gain is presented in a non-monetary frame (e.g., number of installments).

Study 1 was designed to test the dispositional orientation and domain specificity hypotheses. One hundred and ninety-six adults (average age 35.3) participated in this study. A majority (77%) reported having taken a loan and 47% reported having prepaid their loans. Participants were asked to imagine that they had an outstanding loan of $8,000 from a bank that requires a monthly payment of $159 for 120 months. They were asked to consider six different loan prepayment options and for each option they had to indicate whether they would avail the option to prepay the loan, or continue with the current loan payment plan. The framing of the prepayment was manipulated; participants were randomly assigned either to monetary framing condition or non-monetary framing condition. In the monetary framing condition, prepaying the loan allowed the participant to reduce her monthly payment amount. In the non-monetary framing condition, each prepayment plan allowed them to reduce the number of monthly installments. Then to test the effect of their dispositional orientation to money, their pain of payment was measured using Rick et al.’s (2008) scale. The results revealed a predicted two-way interaction between pain of payment and monetary framing, p < .05. Participants with higher pain of payment were more likely to prepay the loan, but only in the monetary frame. Furthermore, follow-up process measures revealed that participants with higher pain of payment were more likely to construe loan prepayment as “saving money in the long run” than as “spending money in the short run” and this construal mediated the effect of pain of payment only in the monetary framing condition.

The pain of payment model posits that unlike tightwads, spendthrifts do not have an innate predisposition to save money. They consider money as a medium (or an instrument) to gain satisfaction. Consequently, they are more likely to compare the satisfaction from