

Effects of Spikes in the Price of Gasoline on Behavioral Intentions: A Mental Accounting Explanation

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ABSTRACT

In recent years, gasoline prices have spiked in response to world events, only to fall again within weeks or months. Anecdotal evidence suggests that these price fluctuations have a substantial impact on consumers' planned spending and their overall perceptions of financial well-being. We propose that consumers' behavioral intentions in response to these spikes are driven in part by how consumers mentally account for the fluctuations in gasoline prices. Specifically, we contend that people allocate sharp increases in the price per gallon of gasoline to a comprehensive mental account. As a result, such increases affect consumers' perceptions of their overall cost of living and have far-reaching effects on their planned spending. These predictions are tested in three experiments. The paper concludes with the discussion of a theoretical and applied implications of the results. Copyright © 2011 John Wiley & Sons, Ltd.

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Gasoline prices have put consumers in the US on a roller-coaster ride over the past several years. Owing to hurricanes Katrina and Ike hitting the oil-producing Southeastern US, current worldwide economic woes, as well as the ongoing conflict in the Middle East, consumers have been regularly exposed to large spikes in gasoline prices in recent years. In 2004, gas prices spiked from \$1.55 per gallon to over \$2.10 per gallon before settling down to \$1.83 per gallon at the end of the year. In 2005, gas prices increased dramatically to above \$3.11 per gallon because of Hurricane Katrina, before ending the year at \$2.24 per gallon. Post-Katrina prices stabilized somewhat in 2006, although gas prices still spiked up to \$3.08 per gallon before ending the year at \$2.38 per gallon. In 2007, gas prices dropped to \$2.21 per gallon and then soared to \$3.25 per gallon, before ending the year at \$3.03. Gasoline prices for 2008 saw perhaps the greatest fluctuations, pushing to a high of \$4.16 per gallon before dropping below \$1.85 per gallon (Energy Information Administration, n.d.). As illustrated in Figure 1, the general upward trend in gasoline prices is marked by a series of regular spikes that tend to be followed by equally steep declines.

CONSUMER RESPONSES TO GASOLINE SPIKES

Anecdotal evidence seems to suggest that sharp increases (i.e. spikes) in the price of gasoline can have a substantial effect on consumer behavior. For example, 75% of Americans report that higher gas prices have led them to reduce their overall discretionary spending (White, 2008). This is somewhat surprising because recent research has shown that consumers often neglect financial costs associated with driving (Feiler & Soll, 2010) and in

general a lack of understanding about the cost of energy and the impact of their own behaviors (Attari, DeKay, Davidson, & Bruine de Bruin, 2010; Larrick & Soll, 2008). Even so, reports of consumers cancelling long-held travel plans and putting greater emphasis on highly fuel-efficient new cars have been widespread (e.g. Krauss, 2008). Predicting where gasoline prices are going to go next is not an easy task, yet many of the major financial decisions that consumers make—from the location of their homes to the type of car they buy and to the vacations that they plan to take—appear to be influenced by the price of gasoline.

In the present research, we propose that how consumers respond to spikes in the price of gasoline depends on how consumers mentally account for such changes. Specifically, we contend that people allocate sharp increases in the price per gallon (PPG) of gasoline to a *comprehensive* mental account (Thaler, 1999). As a result, such increases affect consumers' perceptions of their overall cost of living and have far-reaching effects on their planned spending. To illustrate, consider the probability that an individual would cancel a planned vacation if he or she believed that the rapid increase in the price of gasoline was permanent and would affect not only the cost of this trip but also much of her other spending (e.g. the sharp increase in the cost of living means that the trip will actually be significantly more expensive, and it is necessary to tighten overall spending to keep the rising cost of living from exceeding his or her total income). In contrast, imagine how likely he or she is to cancel that vacation if the decision is based only on the increase in the cost of that one trip (e.g. an extra \$25 in gasoline for a 500-mile road trip). We expect that an individual is much less likely to change intentions for the planned vacation in the second scenario. That is, if consumers assign the cost of a price increase to a *topical account* (Heath & Soll, 1996)—and, therefore, considered the impact on spending in a specific area (such as a single vacation)—we predict that the effect on decision making will be attenuated.

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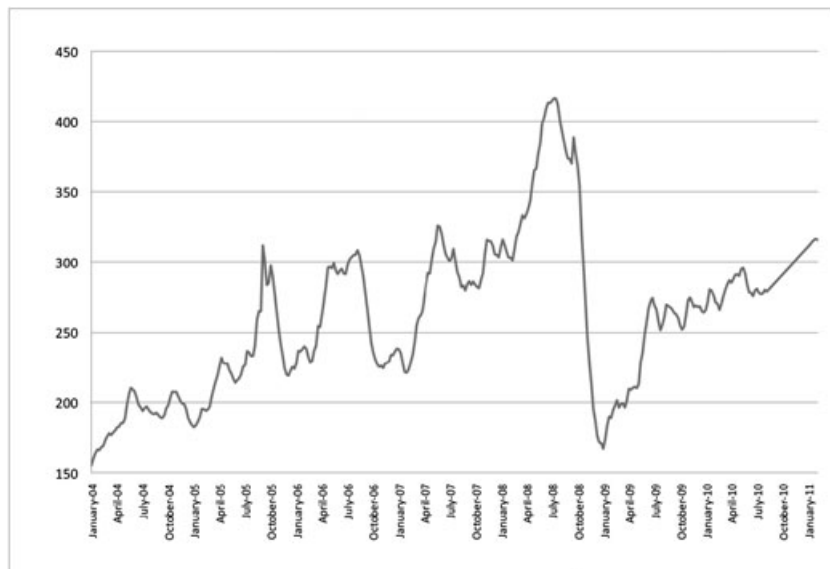


Figure 1. Weekly US all grades all formulations retail gasoline prices (cents per gallon)

In the section that follows, we build on the theory of mental accounting to develop a series of hypotheses that predict the effect of price spikes on consumer decision making. We then report the results of three experimental studies designed to test these predictions and examine the impact of mental accounting on peoples' responses to sharp changes in the price of gasoline. In doing so, we contribute to the extant literature by demonstrating that differentially framing similar price changes can lead to the use of different mental accounts, which in turn can substantially affect spending decisions. In addition, although previous work in this area has been skeptical about the role of comprehensive mental accounting (e.g. Thaler, 1999), our results indicate that such accounting can have an important effect on consumer decision making. More specifically, we find that the theory of mental accounting provides an underlying psychological mechanism capable of explaining consumers' responses to spikes in the price of gasoline. The paper concludes with the discussion of the theoretical and practical implications of our results.

MENTAL ACCOUNTING OF PRICE CHANGES

Prior research has demonstrated that because spending is constrained by the available financial resources that consumers have, people tend to create "mental budgets" where portions of their total financial resources are assigned to separate "topical" mental accounts (e.g. entertainment, groceries, travel) that are used for tracking expenditures (Heath & Soll, 1996). As expenses are incurred for a particular mental account, consumers deplete the funds earmarked as available for that account, which in turn leaves fewer funds available for future purchases in that area. Mentally categorizing available funds in this way has been shown to substantially affect consumer spending (Henderson & Petersen, 1992; Kahneman & Tversky, 1984; Thaler, 1980, 1985).

In addition to topical accounts for specific expenditure categories, consumers also have a "comprehensive" mental

account that includes overall spending and income for both current and future periods (Thaler, 1999). General changes in the economic circumstances of the consumer often affect so many topical accounts that it is difficult for consumers to accurately adjust their mental budget for each and every relevant account. Instead, consumers may seek to incorporate broad changes in their economic circumstances to their comprehensive account. To continue with the travel example, if we know that our road trip is going to cost \$25 more because of a spike in gasoline prices, we can allocate that cost to a topical "vacation" account. However, changes in the price of gasoline affect more than just the cost of a vacation. Higher gasoline prices mean that transportation for various activities (e.g. going shopping, going to work, going out) is more expensive, which in turn affects the cost of many other behaviors as well as the overall cost of living. Therefore, although mental accounting has been traditionally described as predominately "piecemeal and topical" (Thaler, 1999), we suspect that consumer processing of gas price information is an exception to that rule. Specifically, because it is very difficult for a consumer to assign the cost of a spike in the PPG of gasoline to all of the possibly relevant topical accounts, we predict that

H1 : By default, consumers will tend to allocate the change in costs associated with PPG fluctuations to the comprehensive account and be more likely to change planned spending.

Prior research has indicated that mental accounting is sensitive to how decisions are framed (Kahneman & Tversky, 1984; Thaler, 1999). Consumers may default to a comprehensive account for gas price fluctuations because it is very difficult to allocate the associated costs to all of the relevant topical accounts. However, if the price fluctuations were framed within the context of a specific topical account, it would be much easier for people to take the usual piecemeal approach to mental accounting and focus on the impact that price changes have on a specific category of

expenditures. If a spike in gasoline prices is presented as the price per trip (PPT)—for example, a \$0.50 per day for a 10-mile commute or \$25 more for a 500-mile road trip—we expect that consumers will process that information in the relevant topical account. We have predicted (H1) that without invoking this type of specific decision frame, the general PPG representation of gasoline prices combined with the many topical accounts to which the cost of gasoline could be allocated, consumers default to comprehensive accounting. However, when the cost of the price fluctuation is framed within the context of a specific decision, we expect that topical accounting will be invoked.

If this is true, then the perceived cost of the price change is processed piecemeal—that is, decisions are being made within each topical account. From that perspective, the impact of a price spike is less likely to cause a change in planned spending because it adds only a (relatively) small extra cost to each topical account. For example, if the price of gasoline jumps from \$2 to \$3 per gallon and that increase is generalized to the comprehensive account, it suggests a substantial increase in ones' overall cost of living. As a result, it would be reasonable for a consumer to tighten spending across the board—for example, including cancelling vacations, driving a different type of car, driving less, and moving closer to work. However, if that same \$1 price spike is considered only in the context of a planned road trip, the increase in the cost of the vacation alone is relatively minor (e.g. \$25). When the effect of a gas price spike is processed in this type of piecemeal fashion—that is, costs are allocated to individual topical accounts, and decisions are made based on the relatively small cost increases—then major changes in spending behavior (e.g. cancelling a planned vacation over \$25 increase in cost) appear to be overreactions. Therefore, as compared with allocating the costs of PPG fluctuations to the comprehensive account,

H2 : When price fluctuations are framed within a specific context, consumers will tend to allocate the associated costs to the relevant topical account and be less likely to change planned spending.

Similarly, in some cases, price increases may be explicitly short-lived. In such situations, only immediate spending needs to be considered, and allocating the increased cost to the comprehensive account is unnecessary and undesirable. For example, to reflect the higher demand for gasoline over long weekends in the summer, the PPG often increases temporarily. If you are traveling during such an increase, you will have to pay more for gasoline, but because the price is expected to fall after the weekend, you do not have to worry about its impact on your overall cost of living. If you are not traveling during the weekend, the price change does not need to be allocated to a mental account (topical or comprehensive), because there is no change in costs incurred. Therefore,

H3 : When price fluctuations are framed as temporary, consumers will tend to allocate the associated costs to topical accounts and be less likely to change planned spending.

Ultimately, these predictions suggest that the probability of changing behavioral intentions will be affected by the mental account to which the increased cost of gasoline is allocated.

STUDY 1

Pretests showed that the participants in our sample reported an average fuel economy of approximately 25 mpg for their vehicles, meaning that an increase of approximately \$1 per gallon in the price of gas should result in an increase of \$25 or less for a 500-mile trip (on average). In order to test our predictions, we developed and pretested a PPT and PPG frame. The participants in the PPT condition were presented the following scenario:

“Imagine that you are planning a trip from X to Y¹ (approximately 500 miles each way) in a couple weeks to visit friends and family. A couple days before you are actually going to depart for Y, gas prices jump up *and increase the cost of your trip around \$25 each way*. You read in the newspaper that this sudden rise in gas prices is due to problems with oil production in the hurricane ravaged Southeastern U.S., combined with instability in Iraq and the rest of the Middle East.”

Similarly, the participants in the PPG condition were presented the following:

“Imagine that you are planning a trip from X to Y (approximately 500 miles each way) in a couple weeks to visit friends and family. A couple days before you are actually going to depart for Y, gas prices jump up *from an average of \$2.63 a gallon to an average of nearly \$3.60 a gallon*. You read in the newspaper that this sudden rise in gas prices is due to problems with oil production in the hurricane ravaged Southeastern U.S., combined with instability in Iraq and the rest of the Middle East.” (The differences in the conditions were italicized).

Sixty-three pretest participants were randomly assigned to read one of the two conditions and then asked to respond to the following question on a nine-point scale (using 1 for not very likely, to 9 for very likely):

“If you were to encounter the previously described situation, how likely would you be to cancel the trip?”

The participants who viewed the PPT condition were significantly less likely to cancel the vacation ($M=2.08$, standard deviation [SD]=1.25), as compared with the participants who viewed the spike in terms of PPG ($M=3.66$, $SD=2.17$, $F_{61}=10.78$, $p=0.002$).

A key prediction of our research is that people who are using a comprehensive mental account to process the increased costs associated with a gasoline price spike will be more likely to change their behavioral intentions than people who are using a topical account. By using the manipulations from the pretest, Study 1 was designed to explicitly test Hypotheses 1 and 2

¹The names of the cities have been removed from the manuscript to ensure anonymity in the blind review process.

concerning the participants' behavior, as well as H3, which predicted that when price fluctuations are framed as temporary, consumers will tend to allocate the associated costs to topical accounts and be less likely to make changes in their behavioral intentions concerning planned spending. Therefore, in Study 1, we predicted that those participants who were exposed to a temporary frame and/or a specific context frame (PPT) will allocate the cost increase to a topical mental account. This means that only those in the not-temporary and general frame (PPG) condition are expected to use a comprehensive account and, as a result, be more likely to change their behavioral intentions concerning planned spending behavior.

Procedure and design

Study 1 included a total of 151 undergraduates from a large public university on the West Coast of the US who participated in return for partial course credit. The procedure for Study 1 was similar to that described in the pretest, with the addition of conditions where we explicitly manipulated whether or not the gasoline price spike was perceived as temporary. Therefore, the study was a 2 (price increase framing: specific PPT versus general PPG) × 2 (temporal framing: temporary versus not-temporary) full factorial design. The specific (PPT) versus general (PPG) frame conditions were as described in the pretest. In the temporary condition, the participants were told, "Energy experts forecast that the rise in fuel costs is only temporary, and that gas prices should fall back down within a month." In the "not-temporary" condition, the participants were told, "Energy experts forecast that the rise in fuel costs is not-temporary, and that gas prices should climb again within a month."

Results

Consistent with the pretest, the results of Study 1 indicated that the participants who were told that the spike was not-temporary were less likely to cancel the trip in the PPT condition ($M=2.23$, $SD=1.59$) relative to those in the not-temporary PPG condition ($M=3.86$, $SD=2.07$, $F_{76}=15.36$, $p<0.001$). More importantly, as illustrated in Figure 2, the results of Study 1 revealed a significant interaction ($F_{147}=8.56$, $p=0.004$).

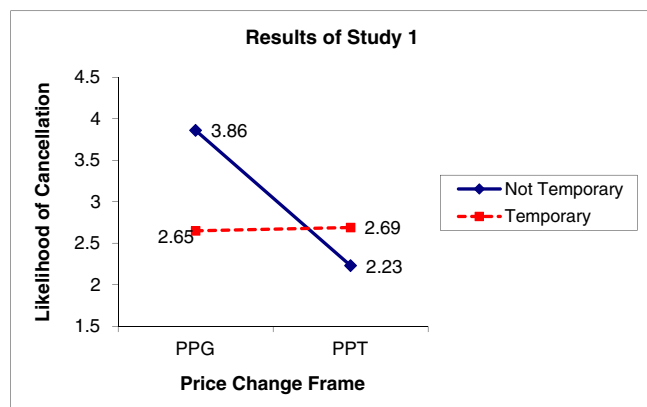


Figure 2. Results of Study 1

As predicted, when the gas price increase was explicitly stated to be temporary, there was no significant effect on the participants' intentions to cancel the trip (PPT mean = 2.69, $SD=1.65$, PPG mean = 2.65, $SD=1.64$, $F_{71}=0.014$, $p=0.908$). Similarly, as expected, there was no significant difference between the temporary conditions and the not-temporary PPT condition (all p -values > 0.250). However, consistent with H3, there was a significant difference between the not-temporary PPG condition and all other conditions (all p -values < 0.05).

Discussion

When the price spike was framed as either temporary or specific to a particular context, people were significantly less likely to change their behavioral intentions concerning planned spending, as compared with the participants who were exposed to neither framing manipulations. These results provide strong support for the prediction that different ways of framing a sharp increase in prices can affect behavioral intentions. In addition, the results are consistent with the notion that allocating costs to a comprehensive account is more likely to result in changes in behavioral intentions than is the use of a topical account to process the same price change information. However, Study 1 did not directly test this prediction. Moreover, although it is clear that presenting the price spike in the usual manner (i.e. PPG) is more likely to result in a change in behavioral intentions than the other conditions that we have examined, we have not yet explicitly tested the prediction that by default, consumers allocate the costs of a gasoline price increase to the comprehensive account (H1). In Study 2, we addressed both of these issues by explicitly instructing half the participants to consider the impact that the price spike will have on their overall spending—that is, telling them to allocate the cost of the price increase comprehensively to their overall cost of living.

STUDY 2

Study 2 was designed to directly test the notion that PPG framing was more likely to lead to comprehensive mental accounting than PPT framing. To accomplish this, the design of Study 2 included a manipulation designed to induce participants to allocate the price change to their comprehensive mental account.

Procedure and design

Study 2 followed the same basic procedures of Study 1, including using similar PPT and PPG manipulations. In addition, approximately half the participants in Study 2 were given comprehensive framing instructions. Thus, Study 2 employed a 2 (price increase framing: specific PPT or general PPG) × 2 (framing instructions: comprehensive or none) full factorial experimental design. The participants were sampled from the same population as in Study 1 ($n=153$). The following statement, presented just prior to

completing the dependent variables, was used to explicitly instruct approximately half the participants to process the price change comprehensively: “When answering the following questions, please consider what this change in gas prices will mean for other activities that you like to participate in as well as your overall lifestyle and spending.” The remaining participants were given no additional instructions before being presented with the dependent measures.

Results

Consistent with the results of Study 1, we found that among the participants without the comprehensive framing instructions, there was a significant difference between the PPT ($M=1.90, SD=1.10$) and the PPG conditions ($M=3.77, SD=1.90, F_{72}=27.80, p<0.001$). In addition, as depicted in Figure 3, the results of Study 2 revealed the predicted significant interaction ($F_{150}=4.54, p=0.035$).

Follow-up tests indicate that among the participants who were given the specific (PPT) frame, the probability of changes in behavioral intentions was significantly greater in the comprehensive instruction condition ($M=2.66, SD=1.96$) than in the no instruction condition ($M=1.90, SD=1.10, F_{78}=4.54, p=0.036$). However, when the participants were given the comprehensive framing instructions, the difference between the PPT ($M=2.66, SD=1.96$) and the PPG ($M=3.33, SD=1.88$) conditions was not significant ($F_{78}=2.466, p=0.120$). Similarly, in the PPG frame, the difference between the no instruction condition ($M=3.77, SD=1.90$) and the comprehensive instruction condition was not significant ($M=3.33, SD=1.88, F_{72}=0.99, p=0.323$).

Discussion

Consistent with the first experiment, this study indicated that people were less likely to cancel a planned trip when the price increase was framed within a specific context (PPT) than when it was present in more common general frame (PPG). In contrast to the first study, which addressed the issue of comprehensive versus topical accounting indirectly, Study 2 directly instructed the participants to consider the

price change comprehensively (or not). The results indicated that those participants who were given the general frame, but no instructions, were just as likely as those given the general frame and the comprehensive instructions to change their behavioral intentions concerning planned spending. This provides support for H1, which predicted that by default—that is, given gasoline price information in the normal (PPG) manner without any additional information (frames or instructions)—people respond as if they were told to think about the price increase comprehensively. In addition, we saw that even those who were given the specific context (PPT) frame became substantially more likely to change their behavioral intentions concerning planned spending when they were instructed to consider the price increase comprehensively.

STUDY 3

The results of the first two studies were consistent with the stated hypotheses and provided strong support for the notion that the way in which gas price spikes are framed can affect behavioral intentions. However, if the PPG frame does trigger comprehensive accounting, then we should see an effect on consumers’ intended behaviors beyond the immediate context of the trip. In fact, given that the comprehensive account is concerned with overall spending and income for both current and future periods (Thaler, 1999), changes to that account should have a broad impact on consumer spending. That is, when a consumer assigns additional costs to the comprehensive account, not only should plans for a driving vacation be affected—the cost of which depends directly on the cost of gasoline—but also other spending intentions that are not part of that topical account. For example, when the comprehensive account is affected by changes in the price of gasoline, the consumer should tend to decrease overall spending and be less likely to spend money in other topical areas (e.g. eating out), in addition to being more likely to cancel the planned driving vacation. Moreover, because the comprehensive account is closely related to an individual’s overall economic circumstances (Thaler, 1999), changes in the comprehensive account should affect how wealthy a consumer feels. For example, if higher gas prices negatively impact the comprehensive account, then consumers should perceive themselves to be less wealthy and believe they have less disposable income available.

Building on the results of the first two studies, which focused on the likelihood of trip cancellation to examine the effect of different frames on behavioral intentions, Study 3 introduced a number of additional dependent variables that measured the impact of changes in gas prices on other behavioral intentions and general perceptions of wealth. These measures allowed for an examination of the effects that the different frames had on spending intentions beyond those that are directly affected by spikes in the price of gasoline (e.g. cancellation of a driving vacation).

Study 3 also addressed a possible alternative explanation for the results of the first two studies—that is, although the

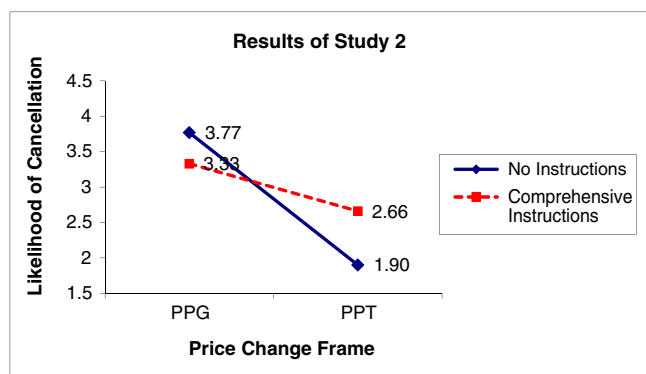


Figure 3. Results of Study 2

economic value of the price increase was held approximately constant across the conditions in the first two studies, the percentage increase was clear and substantial in the PPG condition but not in the PPT condition. It may be that the participants in the PPG condition were not actually using a comprehensive mental account but were instead responding to the fact that the percentage increase in price appeared quite large. In contrast, in the PPT condition, it was not clear what the percentage increase was, so the participants' reaction was muted. In Study 3, the percentage increase was clear in all conditions, and it was held at a constant amount (i.e. 33%).

Procedure and design

The design of Study 3 was similar to that of Studies 1 and 2 in that similar PPT and PPG conditions were used. However, there was one small change to the PPT manipulation. The wording for the PPG condition was similar to that used in the previous two studies:

“A couple days before you are actually going to depart for Y, gas prices jump up from an average of \$3.00 a gallon to an average of nearly \$4.00 a gallon.”

The wording for the PPT condition, however, was revised to enable the participants to more readily recognize the extent of the increase in gasoline prices as a percentage of the total gasoline cost for the trip (consistent with the PPG condition):

“A couple days before you are actually going to depart for Y, gas prices jump and increase the cost of your trip from around \$75 to nearly \$100 each way.”

In addition to this minor change in wording for the PPT framing, a number of other dependent measures were taken. Specifically, after reading the trip scenario, all the participants responded, on a nine-point scale (using 1 for not very likely to 9 for very likely), to six additional questions. The first two measures were designed to capture the participants' perceptions of the effect of the gasoline price increase on their overall wealth:

“If gas prices were to increase as described previously, how likely would you be to feel that you had less disposable income available to spend?”

“If gas prices were to increase as described previously, how likely would you be to feel poorer in general?”

The next two measures were designed to capture consumers' intentions concerning future spending in general, as well as spending on discretionary items not directly related to the price of gasoline that anecdotal reports have suggested can be affected by rising gasoline prices (White, 2008).

“If gas prices were to increase as described previously, how likely would you be to reduce your spending in general?”

“If gas prices were to increase as described previously, how likely would you be to reduce spending on going out to eat?”

The final two questions were designed to capture consumers' intentions to change other behaviors, beyond trip cancellation, as a result of the increase in gasoline prices (newspaper reports have provided anecdotal evidence that both of these types of behaviors are affected by spikes in the price of gasoline):

“If gas prices were to increase as described previously, how likely would you be to consider using alternative modes of travel such as mass transit or biking to get to work or school?”

“If gas prices were to increase as described previously, how likely would you be to consider moving closer to work or school?”

The participants for Study 3 were sampled from a similar population to those in Studies 1 and 2 ($n=51$), with approximately half the participants randomly assigned to the PPG and the PPT conditions.

Results

The main results for Study 3, summarized in Table 1, replicated those of the previous two studies and provided strong additional support for Hypotheses 1 and 2. The participants in the PPT frame condition were significantly less likely to cancel the vacation ($M=2.15, SD=1.43$) than those in the PPG condition ($M=3.60, SD=1.91, F_{49}=9.37, p=0.004$). In addition, the participants in the PPG condition perceived themselves as more likely to have less disposable income ($M=6.92, SD=1.55$) than those in the PPT condition ($M=5.60, SD=2.22, F_{49}=5.23, p=0.027$), as well as to be more likely to feel poorer in general ($M=6.00, SD=2.30$ vs $M=4.35, SD=2.80, F_{49}=5.15, p=0.028$). The participants in the PPG condition also reported that they would be more likely to decrease overall spending ($M=6.28, SD=1.74$) than those in the PPT condition ($M=5.04, SD=2.05, F_{49}=5.23, p=0.024$), as well as being more likely to decrease spending on going out to eat ($M=6.40, SD=2.16$ vs $M=5.15, SD=2.26, F_{49}=4.05, p=0.050$). Finally, the participants in the PPG condition reported that

Table 1. Results of Study 3 means (standard deviations) of dependent variables by price change framing

Reported likelihood to:	Price per gallon	Price per trip
Cancel trip	3.60 (1.91)	2.15** (1.43)
Have less disposable income	6.92 (1.55)	5.60* (2.22)
Feel poorer	6.00 (2.30)	4.35* (2.80)
Decrease overall spending	6.28 (1.74)	5.04* (2.05)
Eat out less	6.40 (2.16)	5.15* (2.26)
Use alternate transportation	5.72 (1.99)	3.54** (2.66)
Move close to work/school	5.48 (2.24)	3.72* (2.78)

* $p < 0.05$.
** $p < 0.01$.

they would be more likely to consider using alternative modes of transportation ($M=5.72$, $SD=1.99$) than those in the PPT condition ($M=3.54$, $SD=2.66$, $F_{49}=10.95$, $p=0.002$), as well as to be more likely to consider moving closer to work or school ($M=5.48$, $SD=2.24$ vs $M=3.72$, $SD=2.78$, $F_{48}=6.09$, $p=0.017$).

Discussion

The results of Study 3 provided additional evidence that the PPG frame triggers comprehensive accounting, which results in consumers being more likely to cancel the target trip. In addition, replicating this key result from the first two studies with a manipulation that clearly defines the extent to which trip costs are increased (and holding the percentage increase consistent across conditions) provided strong evidence that it is not merely the participants' poor trip-cost estimation skills in the PPT condition underlying the differences in behavioral intentions. More importantly, Study 3 demonstrated that the PPG frame, as compared with the PPT frame, had a significantly greater impact on behavioral intentions (beyond trip cancellation), as well as consumers' general perceptions of their overall economic well-being. In combination, the results across all three studies are entirely consistent with the mental accounting explanation being proposed and provide strong support for the stated hypotheses.

GENERAL DISCUSSION

Together, these three studies demonstrate that consumers are much more likely to change their behavioral intentions when gas price spikes are framed as PPG, because they allocate the increased cost to a comprehensive mental account and, therefore, react to spikes in gasoline as if they are permanent changes in their overall cost of living. The present research contributes to the extant literature by demonstrating that allocating the same price change to different mental accounts can substantially affect consumers' behavioral intentions.

These findings are especially important for understanding consumer behavior in the face of large fluctuations in the price of gasoline, which have become the norm in recent years. Our results indicate that when gasoline prices are considered as they normally are in terms of PPG, price spikes can have a substantial impact on behavioral intentions and consumers' overall sense of economic well-being. Our findings are consistent with anecdotal media reports of consumers making substantial changes in their planned spending in response to sharp changes in the price of gasoline (e.g. cancelling vacations, selling homes to move closer to work, buying more fuel-efficient cars; Abelson, 2008; Frighetto, 2008; Rooney, 2008). Although in isolation, these decisions may seem extreme—and make for interesting news headlines of “panicked” consumers—such behavior may be quite reasonable from the perspective of a consumer who sees the change in the price of gas as having a comprehensive, long-term effect on his or her overall cost of living.

Theoretical implications

Theoretically, comprehensive accounting is closely linked to consumers' overall sense of financial well-being and is the normative style of mental accounting assumed by economic theory (Thaler 1999). Therefore, a better understanding of when and how people make use of comprehensive mental accounting is important and has the potential to contribute substantially to the literature on economic judgment and decision making.

Thaler (1999) has expressed some skepticism about whether people do, in fact, engage in comprehensive accounting. In this paper, we have highlighted one important domain—that is, gasoline price changes that are almost exclusively communicated to consumers in terms of PPG—that does seem to be accounted for comprehensively. In doing so, we contribute to a growing body of research in judgment and decision making that investigates how framing effects and consumers' mental models can have important effects on behavior in the domains of energy use and climate change (Attari et al., 2010; Feiler & Soll, 2010; Hardisty, Johnson, & Weber, 2010; Larrick & Soll, 2008; Sterman, 2008; Sterman & Sweeney, 2007; Weber, 2010).

We have examined this domain through the use of a relatively limited set of experimental framing manipulations. As such, additional frames might be worthy of investigation. Is there something specific about the price per unit (i.e. PPG) condition that triggers comprehensive accounting? Or, would other frames have a similar effect—for example, what if the cost of an increase was framed in terms of a consumer's annual or monthly driving expenses? Similarly, we suspect that other consumer expenses might also be accounted for comprehensively. For example, interest rate changes may have the greatest impact on consumers' mortgages but are also assumed to have more general effects on overall spending. Research examining other domains in which comprehensive mental accounting may occur has the potential to add to the findings reported in this paper.

Another potentially interesting perspective for further work in this area comes from theories of opportunity cost neglect, which can result from a decision maker focusing on salient situational elements while neglecting other relevant, but implicit, information (Frederick, Novemsky, Wang, Dhar, & Nowlis, 2009; Thaler, 1980). As such, it might be that specific context frames could suffer from more extensive opportunity cost neglect, whereas general frames might make it easier for implicit information to come to mind during the decision-making process. If so, exploring the relationship between topical versus comprehensive mental accounting and opportunity cost neglect may be a fruitful area for future research.

Finally, it would be of interest to determine more precisely the reasons why the participants chose to cancel their trips and to determine if there were differences in the reasons given for cancelling that varied depending on which frame a participant was presented. It would be expected that the reason for cancelling would differ depending whether a comprehensive or a topical account were being used by the consumer, with the participants in the PPG condition citing reasons more closely related to wealth and income effects,

whereas the participants in the PPT condition might cite reasons more closely associated with the context of the particular spending context.

Practical implications

From an applied perspective, given the central role that consumer confidence plays in economic stability around the world and the increasing volatility of gas prices, a better understanding of how price spikes affect consumers is of critical and growing importance. Our results indicate that the negative impact of sharp price changes on overall consumer spending may, at least in part, be driven by the manner in which the information is framed and communicated. When a price change is temporary (e.g. a short-term spike before a long weekend or during a busy travel season) or when it does not signal a proportional increase in the overall cost of living, it may be more reasonable to think of its impact on specific behaviors. On the other hand, although prices have been volatile in recent years, the trend has clearly been in an upward direction, and higher fuel costs have the potential to affect spending across a number of “topical” accounts. Therefore, in some way, consumers do need to account for the potentially broad impact of the upward trend in the price of gasoline and adjust their spending accordingly.

These results also have potentially important implications for public policy and consumer welfare. For example, if firms or policy makers want to minimize the effect that gas price increases have on consumer spending, then our results suggest that price changes should be framed to invoke topical (i.e. within specific consumption decisions) rather than comprehensive (i.e. overall lifestyle and spending) mental accounts. Using the PPT frame in this research allowed us to examine an important theoretical difference in behavioral intentions driven by topical versus comprehensive mental accounting. Historically, however, when it comes to travel by car, price information is very rarely communicated in terms of PPT. Nevertheless, bus, train, and airline ticket prices do include charges that explicitly increase the PPT as a result of spikes in the price of gasoline and, as a result, may be less likely to lead to trip cancellations. Finally, for those wishing to encourage conservation and reduced fuel consumption, it may make sense to encourage consumers to think comprehensively about the rising price of gasoline.

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