- Dissertation Essay 1 -

The Pain of Deciding:
Indecision, Flexibility, and Consumer Choice Online

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Abstract

Making decisions is not always fun. It is even less so when the decision maker is under the perception that deciding means committing to one out of a multitude of other possibilities. Some shopping environments, such as the Internet, are more likely to instill decision makers with this perception. This work argues that the displeasure of making a decision depends in part on the environment in which it is made, and that both the general displeasure of deciding and the relative displeasure of deciding between the various alternatives can systematically influence choice. Two hypothetical choice studies, and four real choice studies demonstrate that when consumers make purchasing decisions in more restrictive environments, they are more likely to purchase and are as satisfied, because they experience less displeasure from deciding.

"`Cheshire Puss,' she began, ... `Would you tell me, please, which way I ought to go from here?' `That depends a good deal on where you want to get to,' said the Cat.  `I don't much care where--' said Alice. `Then it doesn't matter which way you go,' said the Cat.  `--so long as I get SOMEWHERE,' Alice added as an explanation. `Oh, you're sure to do that,' said the Cat, `if you only walk long enough.' "

/ Lewis Carroll

Alice does not know which road to choose, and thus feels lost. Alice's struggle to make up her mind would have probably left her standing in the woods if the sun was not about to set. She turns to the cat not because she expects to gain information but because any advice would make her decision easier. Alice's situation is similar to the situation many consumers face when trying to buy products online, where there are many easily accessible alternative retailers and product offers. In both cases, the decision maker is under the impression that there exist many alternatives to be had, and thinking about the universe of outcomes makes choosing one much harder. The discomfort of making a decision in such situations and its adverse effects on decision making are at the center of this investigation.

Much is known about the difficulty of making decisions. Decisions could be emotionally difficult because the subject of the decision is emotionally laden, such as a decision between the level of safety of a car and whether it is environment-friendly (Luce, 1998; Luce, Payne, & Battman, 1999); the trade-offs required to solve the decision problem may even be considered inconceivable in a given society, if one needs to put a price on one's siblings, for example (Fiske & Tetlock, 1997). One's attitude towards making such emotionally laden decisions could also be influenced by the locus of the decision outcome (making a decision for one's self vs. others), and the level of accountability required from the decision maker (Beattie et al. 1994). Another source of difficulty may be the amount of cognitive resources required in order to make the right choice. If this amount is too large, or the decision maker is unable to resolve the conflict which the different attributes of the various outcomes pose (Shugan, 1980; Tversky & Shafir, 1992) the decision maker may find the decision aversive. A third source of difficulty may be the appearance of too many alternatives in the choice-set. Having to choose from a set of twenty possible vacation packages as opposed to a set of two, may decrease intrinsic motivation to make the decision and go on vacation (Iyengar & Lepper, 2000). An additional consideration that may make the decision more difficult is the realization that making the decision entails the possibility of generating regret in the future (Bell, 1982; Simonson, 1992; Gilovich & Medvec, 1995) and of being disappointed from the specific outcome one chose (Bell, 1985; Gul,

1991). Some situations and some decision outcomes may generate more regret than their counterparts, because they make it easier for the decision maker to generate counterfactuals. For example, one may feel more regret when missing a flight by five minutes then by fifty. Finally, making the decision may be emotionally or cognitively taxing and deplete the decision maker of valuable energies (Baumister et al, 1998). Therefore, the decision maker may often trade-off decision accuracy in favor of reduced decision effort (Payne, Battman, & Johnson, 1993). In doing so, the decision maker behaves in an adaptive way, responding to the specific situation at hand.

Most of these reasons for decision difficulty arise because of the specific characteristics of the possible decision outcomes (the choice set). A different source of decision difficulty, the one this investigation focuses on, is the negative affect of the decision process itself. This distinction between the pleasure derived from the outcome of the decision process and the displeasure involved in the decision process itself is at the core of this research. The central claim is that the amount of "pain" (negative happiness) the decision maker experiences when going through the motions of making a decision influences the outcome of the decision process in systematic ways, and that this pain is influenced by the decision environment. In particular, the more painful the process as a whole (absolute) the more the decision maker will try to avoid it, but also, the more painful a decision about a specific outcome is, the less likely is that outcome to be chosen (relative).

The paper continues with the development of the concept of the *pain of deciding*, and its effect on the decision process, followed by an analysis of its interaction with the decision environment. This interaction is then tested in two hypothetical choice experiments, and in four real choice experiments. The paper concludes with implications for decision making, and in particular for online retailing and consumption.

Making decisions can be "painful" (negative affect)

The term *pain of deciding* is meant to capture the psychological difficulty of making a choice. Such difficulty could arise from high levels of conflict, when choosing between several similarly attractive outcomes (Shugan, 1980) or when adding an attractive choice to an already attractive set (Tversky & Shafir, 1992). The difficulty of making a decision could also arise from being aware of the possibility and implications of making a wrong decision. Greater awareness of the possibility of a wrong decision can come to be because of greater ease of generating counterfactuals (Kahneman &

Tversky, 1982) and anticipating increased likelihood of feeling regret (Simonson, 1992; Gilovich & Medvec, 1995; Bell, 1985; Gul, 1991).

It is important to note that the pain of deciding is different from the cognitive effort exerted when facing a complex problem or the need to process vast amounts of information (Payne, Bettman, & Johnson, 1993). Rather, the pain of deciding is the difficulty of resolving the conflict imposed by the specific situation and environment, and could be differentially associated to the various decision outcomes. For example, one may find it more difficult to decide to work on a lingering research paper as opposed to going over E-mail when one has four reviews and two grant proposals to complete, than to make the same choice when there is only one review waiting on the desk. It has been shown that the multiplicity of alternative choices raises the level of conflict (Iyengar & Lepper, 2000), as well as increases the ease and likelihood of generating more counterfactuals. This increase in the pain of deciding may make it harder to decide to work on the paper relative to remaining at the state of the status quo (Kahneman, Knetsch, & Thaler, 1991; Dhar, 1996; Baron & Ritov, 1994; to name but a few). According to the suggested theory, the relative pain in deciding to work on the paper is larger when the decision environment introduces the existence of more possible outcomes to the decision process, causing the decision maker to be less likely to make that choice.

In sum, the amount of pleasure or displeasure associated with following a specific decision path is hypothesized to influence choice in two different ways. First, the more painful paths will tend to be avoided, while less painful paths will be chosen more often (*relative pain of deciding*). Second, if a path that avoids making the decision exists (Dhar, 1996; Dhar & Nowlis, 1999), than a more painful decision will tend to be avoided more often (*overall pain of deciding*). These influences stem from characteristics of the decision process itself and not from the considered alternatives. Examples of such influences include the realms of judgment (Schwarz et al. 1991) and payment behavior (Prelec & Loewenstein, 1998), in which the process and not the explicit value of outcomes influences subsequent outcomes. Based on these principles, one can predict that when the pain of deciding is high, people will tend to avoid decisions if possible, or stick to the status quo if not.

The decision making environment

The decision environment can influence both the relative and the absolute pain of making a decision. For example, an environment may promise the possibility of many other alternative outcomes, which may increase the pain of choosing one of the outcomes under current consideration

(greater anticipated regret). Alternatively, an environment may allow the ability to rethink and change a decision in the future which may decrease the pain of making a current choice (lesser anticipated regret). Another way to decrease the pain involved in making a decision is to avoid making a decision altogether or to defer the decision to a later time. Therefore, one would expect to observe more decision avoidance when the decision is more painful. Consequently, changes to the decision environment may directly influence not only the actual outcome of the decision process, but also its existence (whether one defers the decision or not) by changing the amount of pain involved in making the decision.

One way to characterize the difference between a flexible environment (that offers either the ability to defer and rethink a decision or the promise of access to alternative outcomes) and non-flexible one (that does not) is by analogy to decision graphs. If a node in the decision graph reflects a state (initial or outcome) and an arc represents a decision path, then both the existence of other possible outcomes and the ability to defer choice to a later time add [perceived] arcs to the graph. In the terminology of this work, a graph with more decision paths to either the same (deferral – make the same decision in the future) or to other outcomes (existence of other outcomes) represents a state with greater *decision flexibility.*

While the model proposes that decision flexibility has negative implications on the decision making process, the reader is not alone in the feeling that, generally, flexibility in decision making is a positive property. In order to ascertain whether people in general share this belief, the following two experiments, were conducted in a public garden of a large metropolitan. Each survey portrayed two consumers, one with high decision flexibility and one with low decision flexibility: one survey described flexibility as having the ability to delay the decision (consumer A enters the store and realizes that the discount will end a month from that day while consumer B realizes the discount will end the same day); the second survey described flexibility as the ability to have access to more alternatives (consumer A has seven other stores in town that sell similar products, while consumer B has only one other such store). Respondents were asked to indicate in which of the two consumers' states they would rather be (i.e. would they rather be in consumer A's shoes or in consumer B's). The results of both experiments were similar and demonstrated that the majority of consumers prefer to be in a state with greater decision flexibility (70% of participants in the first, and 72% in the second, chose the state with greater flexibility, $p < 0.001$).

Consumers' preference for a state with more decision flexibility does not imply that it will be easier for them to decide in those conditions. Moreover, it is possible that a particular action, such as buying or not buying might be more difficult to undertake in a state of high flexibility. To verify this conjecture, the following two surveys were administered in the streets of a large metropolitan. Each of the surveys portrayed a consumer facing one of the high decision flexibility environments described in the previous two studies. In the first survey the consumer had the ability to delay the decision, and in the second she had the potential access to alternative product offers. Both surveys described a consumer intending to purchase a CD wallet under a state of decision flexibility, and the task was to rate the decision difficulty and the amount of anticipated regret that would be generated by each of the paths available to consumers: to buy, not to buy, and to delay the decision. Both surveys displayed nearly identical results and so they were pulled together for ease of presentation. The results, converted into z-scores, indicated that both the decision to buy and the decision not to buy did not significantly differ on either the regret measure or the difficulty measure. However, delaying the decision was significantly easier than making a decision (means = -0.47 and 0.31 respectively, $t[59] = 5.41$, $p < 0.001$), and also generated significantly less anticipated regret than making a decision (means = -0.52 and 0.19 respectively, $t[59] = 6.40$, $p < 0.001$). In accordance with this result, one may speculate that the choice to delay the decision is regarded by decision makers, in this case, as the default or status quo alternative, which tends to generate the least amount of regret (Simonson, 1992).

These results shed light on the role of the relative pain of making a decision between the different choices available in a purchase decision. In particular they demonstrate that in a flexible situation the decision to buy or not to buy is the most painful to make and delaying the decision is the least painful. This asymmetry in the psychological costs of deciding adds to the understanding of the dynamics of decision deferral under high decision conflict (Tversky & Shafir, 1992; Dhar, 1996; Dhar & Nowlis, 1999).

The result of the relative pain of deciding inquiry (the latter two surveys) can be restated to claim that delaying the decision was perceived as much easier in a state of high decision flexibility. Conversely, making a decision, either to buy or not to buy, in an environment that allows high decision flexibility is more painful. But the earlier two surveys reported that consumers prefer a state with high flexibility. Combining these two findings implies that the preference for flexibility may inherently depend on the easiest solution to the decision problem, which may very well be to avoid it all together.

In sum, the pain of deciding, the difficulty of making a decision or of making a specific choice, is hypothesized to influence the process of making a decision, because decision makers feelings about the process have bearings on the outcome they choose. Furthermore, the decision environment, by allowing more or less decision flexibility, influences the pain of deciding. These two causal relations are summarized in the following model.

The analysis of the interaction between the pain of deciding and the decision making environment leads the following general model: decision flexibility influences the pain of deciding which influences choice – the greater the pain of deciding, the more likely is the least painful path to be chosen (Figure 1).

Decision Flexibility (Environment) ⟹ **Pain of Deciding** ⟹ **Less Painful path (Status Quo)**

Figure 1

The proposed model implies that when the environment generates greater decision flexibility, the pain of deciding may increase, reducing the chances of choosing an outcome different from the status quo. Unfortunately for retailers and sometimes for consumers, in the consumption world, the choice to purchase is hardly ever the status quo (acquiring the product requires an action and not doing so inaction), and so in an environment with greater decision flexibility purchase rates will be lower. Conversely, restricting decision flexibility should reduce the pain of deciding and increase purchase rates.

In order to test the proposed model, two hypothetical choice experiments were administered, and four real choice experiments were run. The first two experiments focus on validating the logical links of the proposed model, the next two experiments provide realistic evidence and external validity, as well as demonstrate convergence of manipulations, to both the theory and the phenomenon. The final two experiments provide further distinctions from competing theories, as well as provide more process measures of the phenomenon.

<u>Experiment 1 – The effect of flexibility on the pain of deciding and on choice</u>

The experiment was designed to validate the logical relations of the model by manipulating the level of flexibility and measuring its effects on the pain of deciding and on subsequent choices, as well as the mediating role played by the pain of deciding in the latter effect.

Method

Participants: Seventy seven pedestrians at a park in a major metropolitan agreed to answer a short decision making survey and were later given candy and thanked for their participation.

Design & Stimuli: The experiment was a hypothetical choice survey with a 2 (high vs. low flexibility) x 2 (flexibility type: the ability to delay choice vs. more perceived alternatives) mixed design (flexibility level was manipulated within and flexibility type between). The survey described two consumers, A and B, who were shopping for a CD wallet, and came upon a deal, in which a particular wallet (a color photo was included) was offered for $5 instead of $10.

Flexibility was manipulated through the descriptions of the different environments that the two consumers were in. Consumer B was always in the low flexibility environment, and consumer A was always in the high flexibility environment. In the first type of flexibility manipulated (ability to delay), the high flexibility state was described as allowing consumer A to delay her choice: the discount that consumer A faced was going to remain for two more months, while in the low flexibility state, the discount consumer B faced was about to end that day. In the second type of flexibility (more possible alternatives), flexibility was manipulated by describing consumer A's town as having seven other stores that sell CD wallets and consumer B's town only one other store. The descriptions were followed by a series of choices and rating scales.

Dependent Measures: Participants were asked for their prediction of whether each consumer (A and B) would decide to buy the CD wallet, and then to estimate the level of difficulty each consumer would feel while making the decision. Participants were also asked to indicate which consumer would take longer to make the decision. In addition, participants were asked to rate the extent to which each consumer will anticipate feeling regret when making the decision, and also to rate how easy it would be for each consumer to generate alternative scenarios in which her decision was wrong. Finally, as a manipulation check, participants were asked to rate the amount of flexibility each consumer would have perceived to have while making her decision. All the choice questions required circling the chosen alternative, and all the rating questions had scales of zero to one hundred, in which higher ratings signified more of each measure.

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Results

      The different descriptions of the states the two consumers were in were supposed to generate different decision flexibility. Participants' mean ratings of the amount of flexibility felt by the consumer under high vs. low flexibility (A vs. B) were 79.19 and 21.49 in the flexibility to decide in the future (t[37] = 8.31, p < 0.001), and 68.10 and 29.13 under the flexibility of having more stores that sell similar products (t[39] = 6.71, p < 0.001). The results suggest that participants' perception of the amount of decision flexibility were indeed influenced by the manipulations in the desired direction. Since both forms of flexibility had similar effects in the subsequent measures as well, in the analysis that follows flexibility is treated as one manipulation.

      The main dependent measure was participants' predicted choices for the two consumers. The proportion of participants predicting the decision to buy for consumer A (15.02%) and those predicting the decision to buy for consumer B (80.26%) was significantly different (t[72] = 12.62, p < 0.001). These results support the prediction that increasing flexibility decreases the propensity to purchase. Flexibility also influenced the pain of deciding, measured as the difficulty of making a decision and the amount of time participants predicted the two consumers would spend thinking about the decision. The two measures were aggregated to generate the pain of deciding construct, normalized to mean zero and scaled to be between -1 and 1, where -1 means that consumer A's decision was more painful and 1 that consumer B's decision was more painful. The predicted mean difficulty was -0.56 which was significantly different than zero (t[74] = 8.26, p <0.001). This result means that participants predicted consumer A's decision to be significantly more painful.

      When examining the mediating role of the pain of deciding in the effect of flexibility on the decision to buy, an interesting picture emerges. The role of the pain of deciding as a predictor of choices was estimated using a probit model, in which choices were used as a dependent measure and the pain of deciding as an independent measure. The results indicate that greater decision difficulty decreases the propensity to buy (t[137] = 3.51, p < 0.001). It is thus important to test whether it is the flexibility that influences decision difficulty that in turn, influences the likelihood of purchases and not some other latent variable. Therefore, decision difficulty was regressed on flexibility to generate the set of predicted values as well as the set of residuals. These two estimates were then added to a probit model as independent measures, to test their predictive power. The results suggest that the effect of flexibility on decision difficulty (predicted set) has a large and significant effect on choices (t[136] = 7.56, p < 0.001), but that the other factors influencing decision difficulty also have a significant effect

on choice (t[136] = 2.40, t = 0.016). Furthermore, the total variance explained by the model increase significantly when adding decision difficulty to the model that includes flexibility as predictor of choice. These results suggest that both decision flexibility and decision difficulty decrease the propensity to buy, and that part of the effect of decision flexibility is caused by an increase to decision difficulty (partial mediation). Other variables that may influence the pain of deciding could be linked to individual differences in preference (varying default outcomes), in their reaction to the different environments, or in their tendency towards regret, etc.

Discussion

The logical links proposed by the model, decision flexibility increases the pain of deciding, which reduces the likelihood of deciding to buy, were verified by the results. The results suggest that greater decision flexibility increases the pain of deciding and lowers purchase rates, and that part of this effect is caused by the direct effect of the pain of deciding on the propensity to buy. Using the result that in a state of decision flexibility, making a decision is much more painful than delaying it, this result could further imply that the overall pain of deciding depends on the particular choice one considers, such that the effect of flexibility on the pain of deciding depends not only on the environment but also on the preference towards a specific alternative (default). In accordance with this distinction, Experiment 2 tested whether there are systematic differences between the levels of pain of deciding associated with the option to buy.

Experiment 2 – The effect of flexibility on the pain of the choice to buy

Method

Participants: Sixty three participants were pedestrians in a popular square of an eastern college town, who agreed to participate in a decision making study. Participants were thanked and given candy for their participation.

Design & Stimuli: The study was a hypothetical choice survey with a two cells (Flexibility type) between participants design. The survey differed from the one used in Experiment 1 in the dependent measures used. Participants were told that both consumers have decided to purchase the CD wallet for $5, and were asked to rate, on a scale of zero to one hundred, for each of the two consumers the difficulty involved in making this particular decision, and also to choose which would have taken longer to decide on this specific choice.

Dependent Measures: The dependent measures were a continuous measure of the predicted difficulty of making the decision to buy, and a binary selection of which consumer made her decision after a shorter period of deliberation.

Results

The results for the two depended measures were not significantly different and were pulled to create a three level scale indicating that either flexibility is more painful, the converse is true, or that they are as painful. The proportion of participants who predicted that making the choice to buy is more painful under high flexibility conditions was significantly larger than those who predicted that there would be no difference or that the converse is true [$t(30) = 4.54$, $p < 0.001$ for the more alternatives flexibility, and $t(29) = 2.07$, $p = 0.047$ for the flexibility to decide at a later time]. Figure 2 displays the average share of each choice of both types of flexibilities.
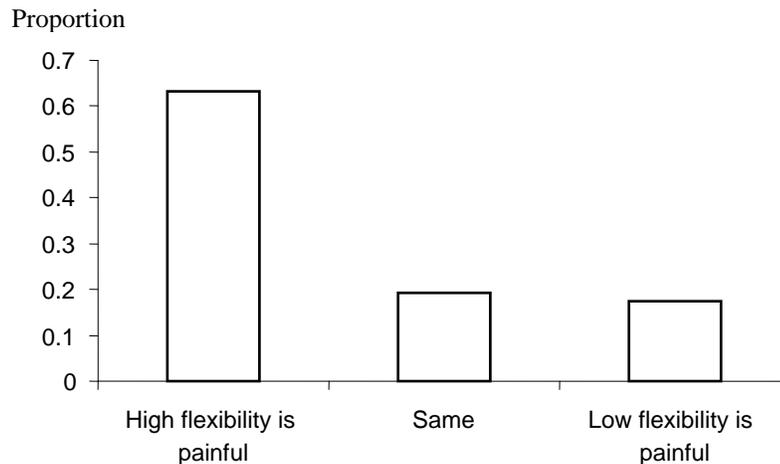
Proportion

Figure 2

Discussion

The results demonstrate that the decisions to buy are perceived to be significantly harder to make under conditions that increase decision flexibility. Together with the previous results, these results indicate that when there is greater decision flexibility, the decision to buy and the decision not to buy become more painful while postponing the decision becomes less painful and easier to make. This analysis implies that restricting consumers' decision flexibility can increase purchase rates, as it will make the purchasing decision relatively easier. Experiment 3 was designed to test this prediction.

Experiment 3 – Eliminating flexibility

Experiments 1 and 2 used predicted hypothetical choice and ratings as the main dependent measures. Such measures are only as good as peoples' theories about others are correct, and may be influenced by considerations such as demand effects and incentives to influence the outcome of the experiments. To increase the reliability and accuracy of the findings by aligning the incentives, as well as the external validity of the results by requiring participants to use their own money, the rest of the experiments used real choice as a dependent measure.

Method

Participants & Design: Participants were general university population recruited through an electronic mail announcement. The announcement advised people to participate, as they would be able to buy "cool" products for bargain prices. Interested students were given the address of the experiment's website.
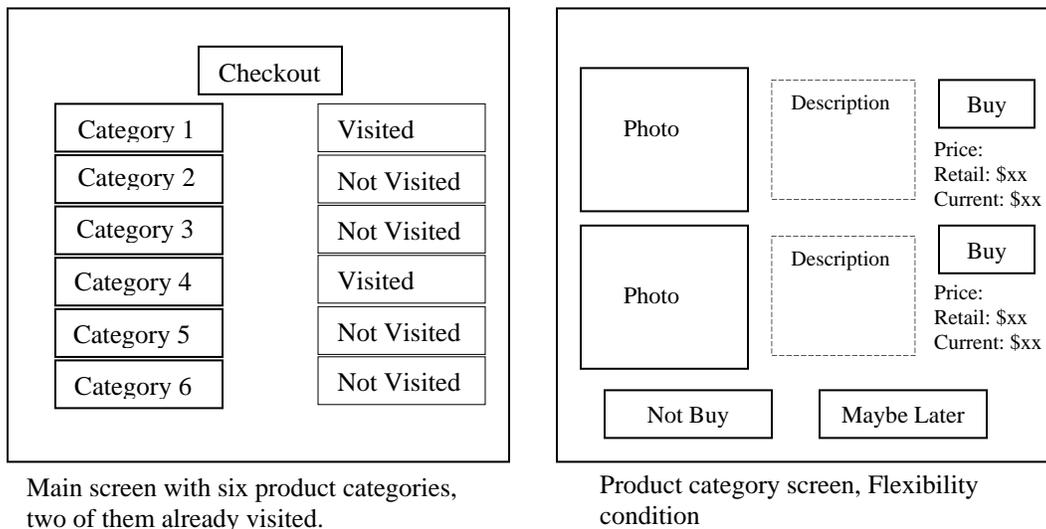
The study was a real choice experiment conducted in an online shopping environment. An electronic commerce website was constructed, using a JAVA applet and a MySQL database (each mouse click was recorded in the database in real time), running on a Windows system through an Apache web server. The experiment consisted of two conditions: a control condition and a flexibility condition. In the control condition products were offered for sale at a discount of 50% from their original price, and participants were instructed that once they made a decision it was unchangeable and that they had to make a choice. The flexibility condition was identical except participants had the options to decide at a later time and to return and change their decisions. The experiment was designed to mimic a real shopping experience (be incentive compatible), and so, participants were not paid for participations, and made their purchases with their own money. Their only incentive to participate was the opportunity to buy products at low prices.

Stimuli: The experiment website was constructed so that users needed to login with their name and E-mail address, went through several instruction pages, and then reached the main screen. The main screen consisted of nine product category buttons, a "checkout" button, and a "done for now, continue later" button. In addition, next to each product category button there was a marker signifying whether that category had already been visited by the participant or not. After selecting a product category, participants were shown a purchasing screen that displayed photos of two products, descriptions of the two products, a retail price and a discounted price for each product, and three buttons. Next to each of the two products there was a "buy" button that, when pressed, signaled the

user's choice to purchase that product. In addition, on the bottom of the screen there was a "don't buy" button that meant that the user didn't want to purchase any of the products, and in the flexibility condition, a "maybe later" button by which the user signaled that she wishes to delay deciding to a later time. Every button press would return the user back to the main screen, and the corresponding product category would be marked as visited (see Illustration 1 for an abstract view of the interface).

The products were chosen to be nine pairs of substitute products that were thought to be of interest to the participant population. The products categories were: books ("The double Helix", "Surely You're Joking, Mr. Feyman"), CDs (Grammy 2000, Rap Grammy 2000), pens (Cross navy blue, Cross chrome), chocolates (Godiva truffles, Godiva collection), DVDs ("The 6th sense", "Boys don't Cry"), gift certificates (Amazon.com, Buy.com), tools (LeatherMan Mini, Mini Maglite), ice-cream coupons ($5, $10), and cookies (Pepperidge Farm chocolate-chunk, double-fudge Oreos).

Illustration 1

Checkout	
Category 1	Visited
Category 2	Not Visited
Category 3	Not Visited
Category 4	Visited
Category 5	Not Visited
Category 6	Not Visited

Main screen with six product categories, two of them already visited.

Photo	Description	Buy Price: Retail: $xx Current: $xx
Photo	Description	Buy Price: Retail: $xx Current: $xx
Not Buy	Maybe Later	

Product category screen, Flexibility condition

The manipulation of flexibility was achieved by varying the instructions between the two conditions, as well as adding the "maybe later" choice in the Flexibility condition. In the control condition participants were told that any decision they were making (any button clicked in a product category screen) would be treated as final. In the flexibility condition, however, participants were told that they could change their decision as many times as they want before they actually checked out (this included leaving and returning another day). On screen one-line reminders of the condition were added into the interface. In the control condition the one-liner was "Remember, once you make a

decision it is final, and cannot be changed," while in the flexibility condition the one-liner was "Remember, you may revisit this screen and your decision as many times as you want."

Procedure: Participants entering the website were shown a login screen in which they had to enter their name and E-mail address, and were randomly assigned to one of the two conditions. Once assigned to a condition, participants would always remain within that condition, including any future return visit to the website. Participants' E-mail address served as identification for future visits, and also as a means to contact the participants in order to arrange for payment and for product delivery. Once logged in, participants read instructions that corresponded to their assigned condition, and when ready, continued to the shopping website. From that point participants behaved freely as consumers in the environment described above.

By enabling participants to make decisions in more than one product category, and thus multiplying the amount of data generated by each consumer, the design introduced the possibility of between decision dependencies such as budget considerations. In order to prevent such dependencies participants were told that once they finish their shopping and checkout, the computer was going to randomly choose one product category, and that only their decision in that product category was going to be the outcome of the shopping process. Participants were instructed that this procedure meant they had to treat each decision they made in a product category as if it were the only one they were making. This was compatible with their incentives because participants could not know in advance which category will be chosen, and each category had exactly the same probability to be chosen.

Once participants checked-out, they were asked to rate (using a sliding bar) their satisfaction from the shopping process and their satisfaction from their choices, and were then informed of the product category that was chosen for them and the resulting outcome. If the product category randomly chosen by the computer happened to be one in which participants chose not to buy, their participation ended, and if the product category was one in which participants decided to purchase, they were contacted to arrange the transaction.

In order to diminish attempts to infer something about the value, uniqueness, or scarcity of the product offer (Cialdini, 2000), participants were told that the website will remain active and available for as long as they needed. In this way, the discount was always there for them, since participants were themselves the ones who decided when to enter a product category. In actuality, no visits to the website were made past the eighth day.

Dependant measures: Participants choices were recorded, as well as the elapsed time from the point they initially entered a product category screen until a decision was made. The timing data included date and time of day, which enabled the analysis of return behavior. In addition, participants' satisfaction ratings from the shopping process and from their choices were recorded.

Results

The data collected are many choices by each individual, in a certain order, in a specific condition. This panel data structure may raise suspicion that the real effects of the treatments are confounded with individual heterogeneity, state dependence (a lingering effect of previous choices), or a possible interaction of these with product heterogeneity (Heckman 1991; Honore & Kyriazidou 2000; and Arellano & Honore, 2000; see Arellano 2000 for a review). The experiment had been designed to minimize such effects by the random choice of the one product category that was selected as the outcome of the experiment. This meant that participants' decisions in different product categories should not have been related. However, there may have been lingering effects of a recent purchase on the next decision, or there may have been specific product categories that consumers perceived as related, or there may have been too much heterogeneity among consumers (as driven by different wealth levels) which may have prevented inter-category decision independence. These issues were examined econometrically, using a random-effects Logit model with lagged choices, as well as lagged interactions[1]. Although there was some heterogeneity in purchasing behavior and some effects of state-dependence, these potential biases had little effect on the dependent measures, and did not change any of the results. Because the qualitative results are robust to all specifications tested, the results will be presented using the most parsimonious model.

As there were no systematic differences between the choice to buy the upper product and the choice to buy the lower product, both these decision were pulled and will be presented as a purchase. Table 1 summarizes the proportion of final decisions to purchase, across product categories, for the two conditions.

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[1] The probabilities used to test the difference between conditions were estimated using the following model, which includes first-order lagged interactions of choices with past product categories (this outperforms a model with first-order lagged choices), as well as an individual specific random effect:

$$\Pr(y_{it} = 1) = \frac{e^{\alpha_i + \beta' x_{it} + \gamma y_{it-1} \cdot x_{t-1}}}{1 + e^{\alpha_i + \beta' x_{it} + \gamma y_{it-1} \cdot x_{t-1}}}$$, where y_{it} is the binary choice of individual i at the relative position t in the sequence of choices, $\alpha_i \sim Gaussian$ is an individual specific random-effect, x_{it} includes a condition dummy and a product category dummy.

Table 1

	Books	CDs	Godiva Chocolates	Cookies	DVDs	Gift Certificates	Ice cream Coupons	Cross Pens	Tools	Total
Control	0.13	0.10	0.56	0.33	0.40	0.22	0.63	0.25	0.13	**0.31**
Flexibility	0.05	0.10	0.25	0.15	0.16	0.30	0.25	0.00	0.06	**0.18**

Participants' purchase choices in the two conditions were significantly different. While the average propensity to purchase in the control condition was 0.31, the average propensity to purchase in the flexibility condition was 0.18 [$t(288) = 2.372$, $p < 0.02$]. Furthermore, the decreased purchasing is mostly driven by participants choosing to delay choice in the Flexibility condition, instead of choosing to buy. The increase in the average propensity to delay choice (0.16) cannibalizes the share of the choice to buy (-0.13) significantly more than the share of the option not to buy (-0.03) [$Chi^2(1) = 4.51$, $p < 0.04$].

A measure that may shed light on the actual decision process is the time participants spent making the decision. If participants' decision process differed fundamentally between conditions, one would expect the timing measures to reflect this difference. However, participants' decision times did not differ significantly across conditions. The mean decision times were 11.54 seconds in the control condition, and 14.05 seconds in the flexibility condition [$t(288) = 1.295$, $p = 0.196$, ns.]. Even when considering the sum of all the times a specific participant spent on a specific decision (including the duration of revisits, which naturally increases the duration in the Flexibility condition), the means are 12.43 seconds in the control condition, and 16.28 seconds in the flexibility condition, and are only marginally significant [$t(254) = 1.673$, p 0.096].

Finally, the design of the study allows a peek at customer return and decision reconsideration behavior. Out of the 290 decisions, 34 (11.72%) were revisits, of them only 8 (2.75%) were changed, 6 of them were changed to purchase from not purchase, and 2 from not purchase to "maybe later", and the rest retained their initial choice. This result suggests that participants that chose the maybe later option probably did not do so because of a resolution to go out and search for more information and return more educated and ready to make a better choice, but rather did so to avoid making the decision. Those that returned mostly procrastinated again.

Participants were slightly more satisfied from the process when they had less flexibility, but slightly more satisfied with their choices when they had more flexibility. These differences were not

significant either in their satisfaction from the process [t(18) = 1.23, p = 0.23], or in their satisfaction from the consumers' own choices [t(18) = 1.24, p = 0.23].

Discussion

Consumers made purchasing decisions about real products, with their own money, in an online website. Restricting consumers' ability to defer their decision and to change their mind seems like a manipulation that consumers would not appreciate. Indeed, the pilot survey found that people prefer a state of decision flexibility over the control condition (see also Gilbert & Ebert, 2002). However, consistent with the central framework proposed, restricting flexibility in an online environment, can increase purchase rates significantly. Consumers who felt a decreased cost to indecision were less likely to purchase, despite the fact that there was also a decreased cost to making a decision (because of the ability to change a decision at a later time). Most of this shift in behavior can be explained by a shift from decision to indecision, and not by a shift from a preference to buy to a preference not to buy. This shift from a preference to buy a product to a choice to delay the decision and eventually not buy the product supports the idea that the indecision driven by decision flexibility is not necessarily in the consumers' best interests[2].

Experiment 4 – Limiting flexibility

Although the results of Experiment 3 suggest that restricting flexibility may be in both the consumers' and the retailers' interests, the survey results suggest that consumers will tend to shy away from such states that lack flexibility. The applicability of the theory, thus, depends on the ability to limit flexibility in a manner that does not discourage consumers. One such mechanism sometimes used by sales people is limiting the lifetime of a discount on a good deal. (Too) Often we hear sales people uttering the words "I can give you this deal today, but tomorrow [raising hands in the air] – I don't know." Using a different manipulation of flexibility that leads to similar results may further strengthen and support the theory. Experiment 4 attempted to provide more support for the theory by utilizing such a mechanism in which the discount was time limited. The main manipulation of flexibility restriction is utilizing time limits. Before describing the manipulations, and in order to design the most appropriate ones, it is useful to review the literature on time pressure.

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[2] The product offers were evaluated as very attractive by ten independent judges from the same population.

Background – Time Pressure

Prior to applying time pressure to the purchase process, one must ascertain its implications for the decision process. For the current purpose, one should determine the correct amount of pressure that would achieve the desired effect of creating an explicit potential for loss and regret in the case of indecision and delay of decisions, without changing the decision process. Too much time pressure could amount to time stress and have negative effects on the decision making process (Svenson & Maule, 1993, for example). In brief, the general effects of time stress on decision making include reductions in information search and processing, changes to the types of information considered, and finally, making wrong judgments and evaluations. Payne et al. (1993) argued that there might be a hierarchy of responses to time pressure that helps decision makers overcome some of these potential pitfalls. They observed that people appear to select a decision strategy that saves considerable effort at the expense of only a small decline in accuracy. The adaptive perspective (Payne et al., 1993) suggests that decision makers adapt to time pressure in ways that appear to be sensitive to the accuracy of the decision process. First, people may try to respond simply by working faster. If this is insufficient, under moderate time pressure, decision makers appear to adapt by being more selective in the information they consider, but under severe time pressure, they shift to strategies that are qualitatively, and not just quantitatively different (people may change processing strategies for example, from alternative-based processing to attribute-based processing). These analyses imply that decision optimality should be lower under high-time-pressure conditions.

Thus, because time pressure could change the decision process, the time sensitive manipulation that is needed to test the current hypothesis is one that is not constraining the decision process, and allows more time to make the decision than is actually needed. Such time limit is proposed to decrease indecision. Based on a pre-test, the actual time pressure in the experiment was chosen so that it will be salient to the decision maker, but will not constrain the decision process.

Participants & Design: Participants were a sample of the population at an East Coast university, mostly students, recruited through messages to various electronic mail lists. The messages advised people to participate, as they would be able to buy "cool" products for bargain prices. Interested parties were given the address of the experiment's website.

Similar to Experiment 3, this was a real choice experiment conducted in an online environment. The experiment consisted of a control condition and three time limit conditions. In all four conditions products were offered for sale at a discount of 50% from their original price, but unlike

the control condition which was similar to the flexibility condition in Experiment 3 in the three time limit conditions the discount was offered for a limited time only (the conditions varied on the length of the discount lifetime). The experiment was designed to be incentive compatible, and so, participants were not paid for participation, and made purchases using their own money.

Stimuli: An electronic commerce website similar to the one used in Experiment 3 was constructed. The product category screen in the control condition was similar in nature to that of Experiment 3, though the particular design (location of photos, text messages, and buttons) was different. In all three time pressure conditions, a vertical progress bar was added at the left side of the screen. The bar was always initialized to full (100%) when participants first entered a product category screen and descended to empty (0%) at a rate which corresponded to the available discount lifetime. When the bar reached zero, the discounted price offer disappeared and only the retail price remained. Participants could still purchase the products, but at the regular retail price. A pretest of choices in the control condition revealed that the average decision time was 8 seconds, with a standard deviation of 4 seconds, and so, the three discount lifetimes used were 16, 32, and 64 seconds. These durations were meant to ensure that the manipulation did not actually constrain the decision process, in an attempt to not affect its quality.

Another slight difference from Experiment 3 was the product selection. Instead of the "tools" product category, two product categories were added reaching a total of ten product categories, and twenty products. The two additional categories were T-shirts with the university logo (two types) and coffee mugs with a university logo (two types).

Procedure and dependant measures: The procedure was identical to that of Experiment 3, except participants were now randomly assigned to one of four conditions. The dependent measures were again choices, decision times, and two satisfaction measures surveyed at the end, as well as a gender indication question. Gender of participants had no significant effect, and will not be discussed any further. The study lasted for one month, but no visits to the website were made past the first three days.

Results

Participants could have made one of four choices in each product category. They could have bought the first product, bought the second product, decided not to buy any product, or postponed their decision to a later time. Since there was no systematic difference between the first or second product, both the decision to buy the first and the decision to buy the second were pulled, and will be

presented as a purchase. At some point, participants eventually pressed the "checkout – finalize my choices" button, any decision that was left as "maybe later" at that point was treated as a non-purchase. Table 2 displays the proportion of purchases in each product category across the four conditions.

Table 2

	Book	Mug	CD	Godiva	T-shirt	Ice cream	Cross pen	DVD	Cookie	Gift Certificate	Total
Control	0.23	0.22	0.04	0.26	0.36	0.13	0.04	0.16	0.17	0.31	**0.20**
16 seconds	0.10	0.24	0.10	0.25	0.33	0.15	0.14	0.25	0.05	0.33	**0.19**
32 seconds	0.41	0.43	0.09	0.70	0.43	0.30	0.13	0.23	0.30	0.43	**0.35**
64 seconds	0.30	0.26	0.08	0.46	0.33	0.35	0.12	0.15	0.23	0.46	**0.27**

In order to determine the significance of the differences between conditions t-tests were conducted on the binary choice data[3]. As can be seen in Table 2 and in Figure 3, participants who had 32 seconds to decide were significantly more likely to purchase than those in the control condition $[t(448) = 3.937, p < 0.0001]$; those who had 64 seconds to decide were also more likely to purchase than those in the control condition $[t(478) = 2.169, p < 0.04]$; and participants who had 16 seconds did not act any different than those under the control condition $[t(428) = 0.148, p = 0.88]$, in which the discount was infinitely long (never expired). The 32 and 64 seconds conditions differed marginally $[t(468) = 1.841, p < 0.07]$.

In order to characterize the purchasing behavior in the study, the binary choice data was transformed to probability of purchase in each condition, using a Logit transformation that included controls for heterogeneity and state-dependence. The results of this estimation are given in appendix A. Figure 2 depicts the average propensity to purchase, according to the above model.

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[3] Similar to Experiment 3, the data collected are several choices by each individual, in a certain order, in a specific condition. This panel data structure was handled in the same fashion as in Experiment 3, and the results presented were found to be robust to heterogeneity and state dependence biases.
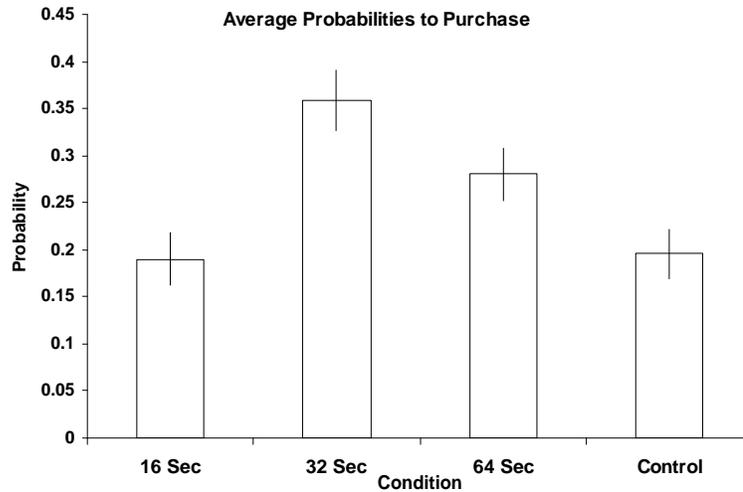
Figure 3

As in Experiment 3, one could use the duration of participants' decision process as an indication of the process itself. Specifically, these decision times may be used as a measure of the obtrusiveness of the manipulation. If the manipulation had a strong effect on the decision process, these would translate into significant differences in its length. The average decision times are listed in Table 3. No decisions were made after the discount expired. Interestingly, even when the decision was not to buy, participants made their choice when the discount was still available.

Table 3

	Average Decision Time	Standard Error
16 Seconds	8.195[*]	0.42
32 Seconds	10.252	0.45
64 Seconds	12.387	0.73
Control	10.993	0.78

* Difference from control condition significant at the $p < 0.01$ level.

These relatively short decision times are an important indication of the non-binding character of the time limit manipulation. If the discount durations were binding, one would expect to see clustering around or very close to the time limit.

In this study, participants could have returned at a later time to modify any decision they have previously made. While in the time limited conditions, later changes would mean not having the discount, there would be no financial costs of doing so in the control condition. Participants could also

go back and cancel a decision to buy. Changing a decision to buy into a decision not to buy had the same incentives in all conditions. Returning to actually buy in those conditions would have not delivered the product at a discount, and indeed no consumer attempted this. Out of a total of 976 decisions made by 98 participants, 89 (9.12%) were revisits to decisions already made. Out of those who returned to reconsider their decision, 45 (53%) did not change their mind, and only 10 (1%) changed their decision to a purchase decision. This means that if a participant previously decided to buy the first product, in most cases they made the same decision upon return. This consistency is remarkable given the fact that there was no indication on the website about their previous choice. In total, 95.59% of decisions were never changed once they were made.

Finally, two measures of satisfaction were collected at the end of the shopping process, after participants chose to checkout and finalize their choices. The first measure was participants' satisfaction from the shopping process itself, and the second was participants' satisfaction with the choices they have made. None of the measures differed significantly across conditions. However, as might be expected, participants in general do not like time pressure when making up their mind, and so, although participants' satisfaction displays only a slight non-significant decreasing trend as the time pressure increases, participants were less satisfied with the process than with their choices [$t(184) = 2.346$, $p < 0.021$]. Participants' mean reported satisfaction scores for both measures are reported in Table 4. These satisfaction measures serve as a dual manipulation check. Finally, although time pressure had some effect, participants were not less satisfied with their choices which means that the time pressure was not so strong as to generate increased uncertainty.

Table 4

Condition	Process Satisfaction	Choices Satisfaction
16 Seconds	37.143	52.762
32 Seconds	46.783	49.913
64 Seconds	46.231	57.815
Control	50.739	57.727

Discussion

As predicted, limiting flexibility by associating a cost with delaying decisions increases the propensity to decide and consequently to purchase. Participants in both the 32 seconds and the 64 seconds conditions purchased significantly more than those in the control condition, who had ample decision flexibility. Also as predicted by previous research on time pressure, putting too much

pressure on decision makers (16 seconds) has the property of potentially reducing confidence, and thus deterring decisions. Note that the 16 seconds time limit was not a binding limitation for most of the participants, but it turned out that it was psychologically sufficient to affect the decision process. This is also reflected in the satisfaction levels reported by participants in this condition. The specific difference between the 32 and 64 conditions is interesting, but is beyond the scope of this work. For a deeper investigation of this fact, see Amir (2002).

Increasing purchase rates from 19% to 36% is obviously in the best interests of the retailer. A fair question at this point is whether restricting flexibility is doing a disservice to consumers or is it the case that restricting flexibility is in their best interests as well. To answer this question, a demand estimation survey was administered to 44 participants from the same population as those who participated in experiments 3 and 4. The survey included a description, photo, and retail price of the products used in those experiments. Participants were asked to mark all the price levels that they would be willing to pay for each product, on a scale that contained prices from $0 to 1.5x the retail price of the product. The results were translated to implied market share for each product at the price offered in the experiments, and then averaged to yield the predicted average market share for the product-price bundles. The predicted average purchase rate was 61%! This share of purchasing is much higher than any in the experiments, suggesting that increasing the propensity to buy was not only in the retailer's interests, but also corresponded to the consumers' interests as well.

Experiments 3 and 4 manipulated decision flexibility and by restricting it in two different ways, increased the propensity to buy. These manipulations to decision flexibility may also be interpreted as presenting a situation in which the decision maker's future access to the same consumption bundle is limited. However, the design of the experiments was such that participants had control over when they enter the limited situation. For example, in Experiment 4 the time limit only started when participants chose to enter a specific product category. This design was an attempt to prevent participants from making inferences about increased product value because of scarcity (Cialdini, 2000) or signals about market value (Spence, 1974). To actually test whether the increase in purchasing in the two experiments is not a result of increased valuations, Experiment 5 and 6 were run.

Experiment 5 – Scarcity / Signaling

When a certain item is scarce, people tend to be more attracted to it (Cialdini, 2000), and may also infer that the scarcity is a signal for its high quality (Spence, 1974). According to these inference processes, a consumer will perceive a product offer of limited availability as more attractive and as having greater value. Under this interpretation, in Experiment 4 for example, participants entering a product category screen and seeing two products that have an expiring discount may have inferred that these products are worth more than if the discount was not about to expire. To test whether scarcity and signaling can account for the results, Experiment 5 manipulated the discount expiration similar to Experiment 4, but only for one of the products. The second product had a discount that was infinitely lived. Once participants made choices in these conditions, one needs to directly compare the demand for the same product when it has an expiring discount and when it does not. Consequently, if the scarcity or signaling principals are at work in the settings of the previous experiments, if participants enter a product category screen and encounter two products offered at a discount, but only one of the product had a discount with an expiring fuse, the relative share of that product should increase, as it would be perceived to be more attractive. The situation described is exactly what participants of Experiment 5 experienced: only one of the products, chosen at random by the computer, had an expiring discount. If, however, scarcity and signaling were not responsible for the increased propensity to purchase in the previous experiments, we should observe no difference in the share of the expiring discount product and the non expiring discount one.

Method

Participants & Design: Participants were graduate students at a business school of an east coast university, recruited through messages to various electronic mail lists. The messages advised people to participate, as they would be able to buy interesting products for bargain prices, and included the address of the experiment's website.

Similar to experiments 3 and 4, the study was a real choice experiment conducted in an online environment. The experiment consisted of a control condition and three time limit conditions. In all four conditions products were offered for sale at a discount of 50% from their original price, but unlike the control condition, in the three time limit conditions one of the two products had a discount that was offered for a limited time only (the conditions varied on the length of the discount lifetime). The particular product that had an expiring discount was randomly chosen by the computer at each

product category for each participant. The experiment was designed to be incentive compatible, and so, participants were not paid for participation, and made purchases using their own money.

Stimuli: An electronic commerce website similar to the one used in experiments 3 and 4 was constructed. The product category screen in the control condition was similar to that of Experiment 4, and in the time limit conditions it resembled those of Experiment 4 as well, except the time limit progress bar appeared only next to the relevant product. When the bar reached zero, the discounted price offer for the product next to it disappeared. Participants could still purchase the products at their current price (only one of which was still discounted). The three discount lifetimes used were 10, 20, and 30 seconds. These durations were meant to ensure that, in two conditions (20 and 30 seconds), the manipulation would not actually constrain the decision process, in an attempt to not affect its quality, and in the third (10 seconds) to test the effect of an even tighter constraint. The products offered were identical to those of Experiment 3.

Procedure and dependant measures: The procedure was identical to that of Experiment 4. The dependent measures were again choices, decision times, and two satisfaction measures surveyed at the end. The study lasted for one month, but no visits to the website were made past the first ten days.

Results

162 participants made 1030 decisions over the course of the experiment. Participants could have made one of four choices in each product category. They could have bought the first or the second product (one of which had an expiring discount), decided not to buy any product, or postponed their decision to a later time. At some point, participants eventually pressed the "checkout – finalize my choices" button, any decision that was left as "maybe later" at that point was treated as a non-purchase (as specified in the instructions).

In order to answer the question central to the investigation, one needs to compare the share of the limited product offer with that of the unlimited product offer. Across all three time limited conditions, participants made 732 decisions, 117 of them were decisions to purchase. In those decisions, participants chose the limited product 52 times (44%), and the unlimited product 65 times (56%), with no significant difference between conditions, and indicating an effect opposite in direction from a signaling / scarcity reaction.

An analysis of the point in time in which participants made decisions in these settings may shed light on the process participants went through when making their decisions. In particular, one

rational algorithm to solve the decision problem may be to first consider the expiring discount product, and if the verdict is not to buy it, than consider the second, non-expiring, offer. This would depend on participants' ability to separate the purchase consideration from the purchase environment. The central model in this work relies on the consumers' inability to do so, and indeed, 81% of the participants who purchased the unlimited product did so before the discount of the limited product expired. Moreover, 90% of decisions not to buy any of the products were also made before the discount for the randomly chosen product expired, as well as 75% of the decisions to defer choice. It thus seems that participants treated the decision problem for both the purchase outcomes, and the delay outcome as a single stage problem.

The actual purchase rates, as well as the decision times did not differ significantly between conditions, although the results were all in the same direction as previous experiments.

Discussion

The design of the experiment enabled the testing of the hypothesis that the increase in purchase rates in experiments 3 and 4 was not caused by an increased valuation of the products in the limited conditions. This hypothesis was supported by the results, in that participants were not more likely to buy the product that had an expiring discount than the one that had an unlimited one. The fact that participants seemed to treat the whole situation as if it were slightly limited, as indicated by the timing of the choice to not buy and the choice to delay the decision, provides further support for the idea that the effect of the environment, captured by these types of manipulations, happens at the process rather than the product level.

Experiment 6 – In the Lab

The findings of the first two experiments provide theoretical support for the proposed model. The next three real choice experiments establish that the pain of deciding, as influenced by the decision environment, has a significant and systematic effect on choice. The real choice experiments provide accuracy and validity because they observe real behavior of people. For this reason, they are limited in their ability to provide potentially intruding measures that may shed light on the actual process participants are going through when making their purchasing decision. Once the existence and main characteristics of the phenomenon are established, such process measurements are best done in the controlled environment of the lab.

In order to provide further evidence for the absolute and the relative effects of the environment on the pain of deciding, and on the final outcome, as well as another test of whether the manipulations influenced choice at the process or at the product level, participants had to be brought into the lab. Experiment 6 replicated the various conditions that were used in the online real choice experiments with lab participants, and thus provided additional process measures.

Method

Participants & Design: Participants were mostly students recruited from an east coast urban area using ads and posters. The ads promised $12 for one hour of decision making studies. Subjects were brought into a computer lab, and were asked to participate in a shopping experience for real products, and while they were doing that, to also answer a paper and pencil questionnaire.

Similar to the previous experiments, the study was a real choice experiment conducted in an online environment, only this time participants were in the lab when they logged in to the website. This experiment was the first out of a series of several unrelated tasks participants undertook in the lab session, and participants were paid for the entire session. The experiment consisted of four conditions: a control condition (*flexibility,* as in Experiment 3), a condition in which the discount for one product would expire (*one-expiring,* as in Experiment 5), a condition in which participants had to make a decision and could not change their choice at a future time (*must decide,* as in Experiment 3), and a time limit condition (*two-expiring,* as in Experiment 4). In all four conditions products were offered for sale at a discount of 50% from their original price, and in two conditions the sale lasted only for twenty seconds (in the *one-expiring* condition – only for one of the products). Participants made purchases using their own money. The fact that participants were in the lab introduced some limitations, one of which was that the option to delay the decision to a later time had less content than in previous experiments. This means that the difference between the *flexibility* and the rest of the conditions is expected to be smaller than before, because it allows less flexibility than in previous experiments.

Stimuli and dependant measures: An electronic commerce website similar to the previous experiments was constructed. The product category screen in each condition was identical to its corresponding source experiment. That is, the *flexibility* condition was identical to the same condition in Experiment 3, the *must decide* condition was identical to the control of that experiment, the *two-expiring* was identical to the time limit conditions in Experiment 4, and the *one-expiring* condition

was identical to the time limit conditions in Experiment 5. The products offered were identical to those of experiments 3 and 5. The dependent measures for the online task were again choices, decision times, and two satisfaction measures surveyed at the end.

In addition, a pencil and paper questionnaire was prepared. The questionnaire had nine identical pages, one for each product category, which included the following measures: a graphic scale of the extent the participant found the decision difficult, a rating of the difficulty of each specific choice option (buy top product, buy bottom product, not buy any product, decide at a later time), a maximum willingness to pay for each of the products, a choice of the decision that may generate the most regret (buy / not buy / delay), and a similar choice of the least regrettable decision, a rating of the amount of decision flexibility encountered, and a measure of the tension / relaxation felt while making the decision (on a cartoon-like scale, similar to the SAM (Bradley & Lang, 1994)).

Procedure: Participants arrived at a pre-assigned time to the computer lab, and were seated at a computer terminal connected to the Internet. As the current experiment was the first task they performed out of a series of five unrelated studies, they were handed the paper and pencil questionnaire mentioned above, that also contained instructions about how to log into the online experiment. The main addition of Experiment 6 was that after making a decision in each product category, participants were asked to fill out a two-page questionnaire. They were also instructed to go through all the product categories, even those that they were not interested in. Participants were told that their decisions were real, and that they would be contacted later by Email to set up payment for and delivery of the items.

Results

774 decisions were made by 86 participants, who also answered a full page questionnaire for each decision made. The means of each dependent measure in each condition, rescaled to a 0 (low) to 10 (high) scale, are summarized in Table 5.

Table 5

	Difficulty of buying	Difficulty of not buying	Difficulty to delay choice	Difficulty of deciding	Flexibility	Tension
Flexibility	4.85	3.76	3.43	3.10	6.15	3.32
One Expiring	4.33*	4.42*	3.99*	3.61*	6.31	4.22*
Must decide	5.29*	4.44*	4.62*	3.14	5.10*	3.32
Both Expiring	5.38*	3.9	4.52*	3.65*	4.76*	3.82*

* Difference from Flexibility condition significant at the $p < 0.05$ or better.

There were no significant differences in the measure of maximum willingness to pay across the four conditions (means: $6.2, $6.5, $6.1, and $6.4), and in addition there were no significant differences in the average differences between the WTP for the two products in each category across conditions (the mean differences ranged from $1.88 to $2.15). It is thus useful to use this measure as a proxy for individual heterogeneity in preferences in the analyses that follow.

To determine whether participants experienced a different state of decision flexibility, the flexibility rating measure was regressed on condition dummies, product category dummies, and the maximum WTP measure. The results suggest that while there was no difference in the level of flexibility between the *flexibility* and the *one-expiring* conditions, the *must-decide* and the *two-expiring* conditions differed from the *flexibility* condition significantly [$F(1,737) = 10.25$, $p = 0.0014$; and $F(1,737) = 25.92$, $p < 0.001$].

Participants rating of the difficulty of delaying the decision to a later time was regressed on condition dummies, product category dummies, and the maximum WTP. The results indicate that participants found it significantly more difficult to delay the decision in the *one-expiring*, *must-decide*, and *two-expiring* conditions than in the *flexibility* condition [$F(1,699) = 3.82$, $p = 0.051$; $F(1,699) = 16.99$, $p < 0.001$; and $F(1,699) = 15.49$, $p < 0.001$ respectively].

Participants also rated their most regretful choice and their least regretful choice on two different scales. While the modal most regretful act in all conditions was the act of buying, the modal least regretful act was not buying in all but the flexibility condition. In the latter condition, the modal least regretful choice was delaying the decision to a future time.

The binary choice data was analyzed using a probit model, controlling for conditions, product categories, and preference heterogeneity (using the WTP measure), and including independent variables for difficulty of buying, difficulty of not buying, difficulty of delaying the decision, and for flexibility. The results indicate that, as predicted, the difficulty of both not buying and delaying the decision increases the propensity to purchase [ß = 0.121, t(694) = 5.10, p < 0.001 and ß = 0.05, t(694) = 2.11, p = 0.035 respectively], and that difficulty to buy and greater flexibility decrease the propensity to purchase [ß = -0.069, t(694) = 2.5, p = 0.012 and ß = -0.04, t(694) = 1.69, p = 0.091 respectively]. The results further indicate that the effect of the difficulty of not buying is the most influential out of the four measures.

Discussion

This experiment adds additional pieces of knowledge to the decision flexibility – pain of deciding paradigm. In particular, the measure of flexibility provided a manipulation check for the previous three experiments; the measurement of maximum willingness to pay, apart from serving as a control of preference heterogeneity, strengthened the evidence that the increase in purchasing behavior had not been generated by an increase in product valuation; and that both the absolute and the relative ease of committing to a specific decision path influence the outcome of the decision process.

General Discussion

The framework proposed postulates that the environment in which decisions are made influences the outcome of the decision process, not only by influencing the way the decision maker views the different alternatives, but also by influencing the attraction of the decision process itself. In turn, the amount of displeasure the decision maker experiences while considering various decision paths influences the likelihood that they will be undertaken. The *pain of deciding* is therefore a vessel by which the decision environment systematically influences choice. Specifically, the amount of decision conflict and anticipated regret associated with the decision at large and with the various specific outcomes, is a function of the decision environment.

Marketers should be particularly attuned to such environmental effects. The aspects of the decision environment that influence the pain of deciding, and thus the final choice, are often under the control of the marketer. This research suggests that the pain of deciding is a hurdle on the way to attain closure, and that manipulating the decision environment, by changing the level of decision flexibility, may help overcome that hurdle.

In most consumption occasions, the decision to buy is not the status-quo. Consequently, the suggested theory, decision flexibility influences choice through the pain of deciding, implies that when decision flexibility increases, consumers experience greater pain in moving away from the status quo (making the decision to buy). Thus, consumers are more likely not to buy and to defer the decision. Experiment 1 demonstrated that decision flexibility reduces the propensity to buy a given product, and that this decrease could be explained by increased pain of deciding. Building on the result that making a decision is more painful than delaying it, Experiment 2 demonstrated that consumers indeed find the decision to buy more painful in a state of high decision flexibility than in a state on low decision flexibility. Applying the theory to real purchase behavior, Experiment 3 validated the theory by demonstrating that adding decision flexibility significantly decreases purchase rates. This result was driven, at large, by a switch consumers made between choosing to buy and choosing to avoid the pain of decision.

It is fascinating that consumers chose to delay the decision at all, as they had the opportunity to return to the product screen and modify any choice they have previously made. In such settings, even a minute preference for one of the options should dictate choosing that option, over the delay alternative. Interestingly, most consumers who decided to delay choice ended up not purchasing at all, as discussed below. However, an earlier study demonstrated that people in general like decision flexibility, and in accordance, consumers were not very pleased with the manipulation that limited their flexibility. Experiment 4 was an attempt to apply the theory using a different more subtle manipulation, and provided further support for the suggested model. Participants in Experiment 4 purchased significantly more products when their decision flexibility was limited by the short lifetime of a discount. Experiment 5 demonstrated that the increase in purchasing observed in Experiment 4, when the discount had a limited lifetime, was not caused by an increased valuation of the product itself. Such valuation increase could have arisen from inferences about increased market value or because of a perception of scarcity. The results of Experiment 5 demonstrate that perception of scarcity cannot account for the increased purchases in Experiment 4. Experiment 6 took the same manipulations of the previous online experiments into the lab to provide better measures of participants' decision processes, providing measurements of the absolute and the relative pain of deciding, as well as a manipulation check for the amount of decision flexibility inherent in each condition. Experiment 6 also provided support for the notion that the flexibility manipulation influenced the decision at the process level, rather than at the product valuation level, by

demonstrating that while the manipulation had an impact on choice it did not change the willingness to pay for the products. This result provides even further proof that participants did not treat the flexibility manipulation as a signal for increased product value.

In many consumption situations the retailer has some control over the consumption environment and thus on the amount of decision flexibility experienced by consumers. This research verifies the intuition that allowing too little flexibility is not appreciated by consumers, but more importantly, demonstrates that allowing consumers too much decision flexibility may increase the difficulty of making decisions, and in particular, the difficulty of making the decision to buy. Moreover, decision flexibility significantly decreases the relative pain of indecision, and consumers are therefore far more likely to resort to decision deferral when allowed greater decision flexibility. This means that sales mechanisms should promote making decisions, and that this may be achieved by rewarding decisions and penalizing flexibility and indecision. A direct implication of this principle is that technological advancements that simplify the shopping process and increase decision flexibility may have adverse effects on purchasing behavior because they offset the psychological balance that people are used to when making such decisions. Such adverse effects can be reduced by employing specific flexibility limiting strategies, some of which have been investigated in this work.

Future research

The concept of decision deferral relates to procrastination in the following way: making the decision is potentially beneficial, because one can choose the alternative that generates the most happiness. However, if the situation is not compelling enough to actually force making a decision, then people who entertain a myopic expectation that in the future they could make an even better decision will tend not to decide; and in the future, unless the situation changes, the same thing will happen again, and again.

The basic experimental design that allowed participants to defer decisions and return at a later time (minutes, hours, days, or even weeks later) enabled the investigation of procrastination. In particular, procrastination in these settings means that participants choose to decide at a later time, and when they do return, again choose to decide at a later time, and so on. Indeed this was the most common action upon revisiting a decision. A weaker form of procrastination may be to choose to decide later, and never return to make a decision. Procrastination may be disproved if participants return at a later time and change their decision, either buy one of the products or choose not to buy. An

important characteristic that differentiates procrastination from simple delay is the actual intention. In the case of procrastination, the decision maker intends to make a decision, only not just now, whereas in the normal delay situation, one may already realize that not deciding may very well be the preferred path and outcome. Various conditions in the studies presented provide natural observations of the unfolding of the purchase behavior over time and as summarized above displayed just this type of behavior. Alarmingly, the conditions that allowed participants to procrastinate are those that most resemble the flexible online environment.

In Experiment 4, it is interesting to investigate the subsequent behavior of participants who chose the "maybe later" option. Out of a total of 65 such decisions, only 13 (20%) were returned to, and 6 were ultimately changed, but only 2 of those to a purchase decision. This means that over 90% of these decisions were left open and never acted upon.

But perhaps the strongest procrastination like behavior was demonstrated in Experiment 3, where in the Flexibility condition participants could delay the decision, but also return and change any decision they had previously made. Out of the 37.24% (108) of decisions that were "maybe later", only 8.3% (9) were revisited, and no decision was changed! This means that even those participants who chose to decide later, and actually revisited that decision, ended up choosing to decide later, again. Furthermore, two decisions not to purchase were subsequently changed to "maybe later", and also never acted upon.

The evidence portrays a situation in which consumers who choose to decide at a later time rarely do so, and those who try, end up making the same act of postponing the decision (Tykocinski & Pittman, 1998). This behavior is mostly apparent in conditions that allow decision flexibility. A qualitative attempt to learn about the antecedents of this behavior, by sending an electronic mail to procrastinators inquiring about their motives and subsequent behavior, revealed that most procrastinators "intended to come back at a later time, but kinda' forgot all about it".

This research raises several interesting questions about the micro domain of the process of making a purchasing decision, as well as in the macro domain of selling and controlling the flexibility of the shopping environment. Several manipulations in the current research influenced the actual outcomes of decision process, without investigating the actual changes in the internal mechanisms that are responsible for the change in the process (the difference between the 32 and 64 seconds conditions in Experiment 4, for example). And finally, this research only slightly addressed the emotional

(satisfaction, happiness, and confidence) implications of decision deferral and procrastination. These may be related to the study of self control, procrastination, and cognitive dissonance.

Final words

The results presented above suggest that decision flexibility influences the decision process systematically, in part through its effect on the pain decision makers feel when considering different decision paths. The concept of decision flexibility as introduced presents a new perspective by which to view the effects of the environment on decision making. The results suggest that the pain of deciding is not cognitive load, but rather the dislike of the inherent conflict involved in deciding about particular outcomes. The mediating role of the pain of deciding suggests that decision makers' final choice may be related to the ease of deciding on its corresponding path.

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Appendix A

?	Discrete Choice	Discrete Choice w/ lags	Discrete Choice w/ lagged interactions	D. C. w/ individual heterogeneity	D. C. w/ heterogeneity, lagged choice	D. C. w/ heterogeneity, lagged interactions
T1	**-1.739**	**-1.606**	**-1.772**	**-2.143**	**-1.686**	**-2.066**
	(-5.31)	**(-3.96)**	**(-5.21)**	**(-4.74)**	**(-3.13)**	**(-4.196)**
T2	**-1.075**	**-1.033**	**-1.205**	**-1.367**	-0.842	**-1.234**
	(-3.51)	**(-2.60)**	**(-3.76)**	**(-3.28)**	(-1.62)	**(-2.728)**
T3	**-1.388**	**-1.306**	**-1.451**	**-1.702**	**-1.205**	**-1.580**
	(-4.52)	**(-3.38)**	**(-4.53)**	**(-4.15)**	**(-2.42)**	**(-3.551)**
T4	**-1.858**	**-1.723**	**-1.892**	**-2.277**	**-1.820**	**-2.232**
	(-5.82)	**(-4.23)**	**(-5.73)**	**(-5.28)**	**(-3.47)**	**(-4.802)**
PC1	0.269	-	0.178	0.4110	-	0.444
	(0.59)		(0.38)	(0.80)		(0.837)
PC2	0.569	0.299	0.497	0.691	0.266	0.641
	(1.56)	(0.69)	(1.28)	(1.71)	(0.54)	(1.466)
PC3	**-1.037**	**-1.339**	**-1.295**	**-1.241**	**-1.679**	**-1.543**
	(-2.15)	**(-2.48)**	**(-2.57)**	**(-2.36)**	**(-2.81)**	**(-2.709)**
PC4	**1.237**	**1.079**	**1.275**	**1.543**	**1.079**	**1.548**
	(3.51)	**(2.52)**	**(3.50)**	**(3.89)**	**(2.23)**	**(3.746)**
PC5	**0.890**	0.555	0.756	**1.080**	0.702	**1.033**
	(2.50)	(1.29)	(1.95)	**(2.71)**	(1.45)	**(2.352)**
PC6	0.212	-0.109	0.132	0.239	-0.168	0.276
	(0.55)	(-0.24)	(0.33)	(0.56)	(-0.33)	(0.610)
PC7	-0.668	-0.947	-0.720	-0.768	**-1.219**	-0.740
	(-1.53)	(-1.90)	(-1.58)	(-1.61)	**(-2.20)**	(-1.474)
PC8	-	-0.208	-	-	-0.473	-
		(-0.45)			(-0.91)	
PC9	0.018	-0.224	-0.183	0.041	-0.405	-0.155
	(0.05)	(-0.50)	(-0.45)	(0.10)	(-0.80)	(0.735)
PC10	**0.962**	0.705	**0.763**	**1.201**	0.787	**1.111**
	(2.73)	(1.66)	**(2.03)**	**(3.05)**	(1.64)	**(2.614)**
Y_{t-1}	-	**0.632**	-	-	-0.345	-
		(3.32)			(-1.33)	
Y1	-	-	0.492	-	-	-0.247
			(1.00)			(-0.413)
Y2	-	-	**1.038**	-	-	0.268
			(2.07)			(0.454)
Y3	-	-	0.274	-	-	-1.823
			(0.34)			(-1.725)
Y4	-	-	0.623	-	-	-0.084
			(1.56)			(-0.177)
Y5	-	-	0.335	-	-	-0.785
			(0.79)			(-1.517)
Y6	-	-	-0.142	-	-	**-1.546**
			(-0.21)			**(-1.968)**
Y7	-	-	0.299	-	-	-1.529
			(0.36)			(-1.507)
Y8	-	-	**1.544**	-	-	0.597
			(2.82)			(0.897)
Y9	-	-	**1.571**	-	-	0.567
			(2.74)			(0.792)
Y10	-	-	-0.484	-	-	-1.189
			(-0.60)			(-1.325)
Log Liklihood	-443.380	-437.979	-432.205	-417.272	-416.369	-409.243