Trying Hard or Hardly Trying: An Analysis of Context Effects in Choice

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Several studies have shown that consumer choice is often influenced by the context or the set of alternatives under consideration. Context effects have largely been explained in terms of constructive preferences that are consistent with 2 theoretical accounts—effort minimization and perceptual contrast—that emphasize different underlying motivations. We propose that the effect of time pressure on context effects can be used as a moderating variable to determine which of the 2 motives is supported. Specifically, if context effects bias preferences due to effort minimization, time pressure should increase the magnitude of such effects. In contrast, if context effects arise due to an excessive focus on the relational characteristics of the alternatives provided, time pressure should reduce the magnitude of such effects. We examine this proposition in relation to the compromise effect and a choice between an extreme and an all-average option. We find that the compromise effect and the preference for an all-average alternative are both reduced under time pressure. A study using Mouselab provides additional support for the underlying decision mechanisms. We discuss the theoretical implications of this research and explore its consequences for marketers.

A major focus in the decision-making literature has been on the problem of how people choose among a set of available alternatives. Although the classical theory of choice assumes that each alternative has a utility or subjective value, and that the consumer selects the alternative with the highest value, one of the most researched areas in behavioral decision theory has been the understanding of how actual choice behavior differs from the principle of value maximization (e.g., Bettman, Luce, & Payne, 1998). An implication of the value maximization principle is that the preference between alternatives is independent of the choice context, as defined by the set of alternatives under consideration (Simonson & Tversky, 1992).

However, a number of studies that have investigated the effect of the choice context show a systematic effect of introducing a new option on the relative preference among alternatives that were available all along, resulting in the violation of preference invariance. A number of different effects in consumer choice, such as the attraction and the compromise effect, have been identified in the literature (e.g., Huber, Payne, & Puto, 1982; Simonson, 1989). An underlying theme of these findings is that consumer preferences are often uncertain and are constructed in the generation of a response to a choice task (Slovic, 1995).

The manner in which preferences are constructed can be understood in terms of two alternative frameworks. According to the effort–accuracy framework, consumers select
among diverse decision strategies by making a trade-off between the desire to make an accurate decision and the desire to minimize effort. Thus, task- or context-related changes that alter the amount of effort required to make the best possible choice can result in a change in strategy selection and potentially inconsistent outcomes. For example, studies of the effect of the number of items in the choice set show that an increase in the number of alternatives facing consumers leads to a greater use of noncompensatory strategies (Johnson & Meyer, 1984; Payne, 1976). An alternative viewpoint of preference construction based on the perceptual framework depicts consumers as focusing on certain aspects of the alternatives that are particularly salient in the decision task (Simonson & Tversky, 1992). Specifically, consumers seem to focus on the value of an option in relation to the other options in the choice set. An implicit assumption of this framework is that participants are working hard to identify the best possible choice, but do so by focusing on relational characteristics of the alternatives at the expense of absolute characteristics of the option. For example, according to Simonson and Tversky (1992), participants tend to focus on the comparative aspects of the choice alternatives, and this adds complications to the decision process that render them vulnerable to context effects. By focusing on relative attribute values, participants give heavy weight to local trade-offs and ignore more absolute or global assessments, which could reduce context effects in judgment. According to this view, different contexts highlight different local trade-offs, alter the degree of attention to local versus global aspects, and thus have an impact on the degree of decision difficulty, often giving rise to inconsistent decisions (Shafrir, 1993). In summary, the existence of context effects in choice can be attributed to the construction of preferences caused by (a) the shift in decision strategies based on considerations of effort–accuracy trade-offs or (b) the amount of focus on making effortful compensatory trade-offs and relative aspects of the alternatives at the expense of more global evaluation. Thus, context effects are consistent with choice simplification due to changes in decision complexity or due to an attempt at making compensatory comparisons among the alternatives provided. An obvious question that arises is, “Which of these two accounts best captures the decision processes that underlie context effects?”

Although context effects might be compatible with either account, this article distinguishes between them by examining the effect of time pressure on context effects. If context effects arise due to effort minimization, the effort–accuracy framework suggests that, as a full analysis of options becomes even more difficult due to time pressure, the tendency toward simplification should increase the susceptibility to context effects. In contrast, if context effects arise due to the difficulty of making compensatory comparisons among the relative characteristics of the options, consumers under time pressure are likely to make fewer compensatory comparisons, rendering them somewhat less susceptible to context effects. In addition to a lesser consideration of the relative trade-offs, the greater adoption of lexicographic decision strategies under time pressure (e.g., Payne, Bettman, & Johnson, 1988) should reduce context effects that result in extremeness aversion or the preference of a compromise option. Thus, the two accounts for the construction of preferences make opposite predictions about the effect of time pressure on the magnitude of context effects.

In addition to understanding how context effects in choice change under time pressure, we also investigate the decision processes underlying context effects. Moreover, a consideration of the two accounts for constructive preferences can help us understand which consumers are more susceptible to context effects. For example, if context effects arise due to use of effort minimizing heuristic, it suggests that low-involvement consumers are more susceptible to context effects. Alternatively, according to the perceptual framework, involved consumers who rely on comparative aspects and carefully attempt to balance local trade-offs may be more prone to context effects.

This article reviews previous research relevant to the area and tests the effect of time pressure on the relative preference among alternatives in the domain of two well-established context effects: the compromise effect and the choice of an “all-average” option in relation to an enriched option. Two experiments were conducted that imply that the participants who make compensatory comparisons among the alternatives provided are more likely to have a preference for a compromise and an “all-average” option. As a consequence, the studies show that the size of the compromise effect decreases under time pressure and that the preference for the all-average option decreases under time pressure. Using Mouselab, we also examined the decision processes underlying the effect of time pressure on the construction of preferences. We report the findings and conclude with a discussion of their implications for marketers as well as suggestions for future research.

THE PREFERENCE FOR A COMPROMISE OPTION

An underlying notion of a good decision rests on the case that this decision will be consistent across different situations. The failure of preferences to be consistent across different choice contexts results in the violation of value maximization. One phenomenon that demonstrates such a violation is the compromise effect, which refers to the finding that, within an offered set, options with extreme values are relatively less attractive than options with intermediate values (Simonson, 1989). For example, consider two-dimensional options x, y, and z, such that y lies between x and z. According to the compromise effect, the addition of x to {y, z} increases the share of y relative to z. This pattern of results, under certain plausible conditions, violates the principle of value maximization.
Value maximization predicts that, in opposition to the compromise effect, $y$ should lose relatively more market share than $z$ from the introduction of $x$ because $y$ is closer to $x$ than is $z$ (Tversky & Simonson, 1993).

The explanation for the compromise effect implicitly suggests that the choice of an intermediate alternative is a strategy that is employed to avoid selecting among extreme attribute values (Simonson & Tversky, 1992). Accordingly, the selection of a compromise option can be viewed as an attempt at using an effort minimizing heuristic due to an increase in choice complexity when the two-option choice set is enlarged by adding a new alternative to the choice set. Alternatively, the selection of a compromise option might be a result of taking into account local, relative characteristics of the alternatives in the choice set. This would imply that respondents who are more likely to attempt compensatory trade-off comparisons find the choice more difficult and are more likely to exhibit the compromise effect (Dhar, 1996).

One way in which these two alternative accounts can be distinguished is by examining the actual decision processes for consumers who select the compromise option. Simonson (1989), using think aloud protocols, showed that decision protocols of participants who selected the compromise option were longer than those of participants who chose the extreme options. An alternate way of testing between these competing explanations is by predicting the effect of a new variable on the compromise effect. We propose that the two accounts make opposite predictions about the effect of time pressure on the compromise effect. First, consider the preference for the option that is seen as intermediate when a more extreme, new alternative is added. If enlarging the choice set is seen as increasing choice complexity, the selection of a compromise option could be viewed as an attempt by effort-minimizing individuals at simplifying the increase in complexity of the decision problem. This suggests that increased time constraint serves to further restrict cognitive processing (e.g., see Edland & Svenson, 1993), resulting in a greater number of respondents resorting to a simplifying heuristic of selecting the middle alternative. Thus, if the choice of the compromise option can be attributed to an attempt at simplification when the choice set is enlarged, time pressure should increase the likelihood of selecting the compromise option.

Alternatively, if the selection of a middle alternative is a consequence of the difficulty in making extreme trade-offs in the process of compensatory comparisons among the alternatives provided, those under time pressure might be less likely to engage in compensatory trade-offs among the options provided and thus be less likely to choose the middle option. Within this framework, the change in decision processes under time constraints suggests two reasons why the compromise effect will weaken under time pressure. First, consumers under time pressure are more likely to use noncompensatory decision rules (Payne et al., 1988), which makes the choice easier compared to decisions rules that attempt to make difficult trade-offs. To the extent that making difficult compensatory comparisons favors a compromise alternative (Dhar & Simonson, 1998), a reduction in the likelihood of engaging in such comparison processes should weaken this effect. Second, the use of noncompensatory rules is less likely to favor the selection of an alternative that is not the best on any single attribute. For example, rules that increase in use under time pressure such as the lexicographic or the Max rules (e.g., Svenson, Edland, & Slovic, 1990) favor extreme options that excel on the most important attribute. Because these rules are more likely to be used under time pressure, it again argues for a reduction in the magnitude of the compromise effect.

The first study investigates whether time pressure increases or decreases the compromise effect—that is, whether the preference for the middle option is increased or decreased when participants are limited in the amount of time available to make choices. As outlined earlier, the choice simplification account predicts an increase due to the use of simplifying decision rules. On the other hand, the perceptual account predicts a decrease in preference for the middle option due to an increase in the use of noncompensatory trade-off comparisons as opposed to compensatory comparison among the alternatives.

**STUDY 1: CHOICE OF A COMPROMISE OPTION**

**Method**

Participants were 250 undergraduate marketing students fulfilling a course requirement. Respondents made choices in several different product categories. Two factors were manipulated in a $2 \times 2$ (Decisions Either Made With or Without Time Pressure $\times$ Either Two or Three Options in the Choice Set) between-subjects design. Participants in the time pressure condition were given a maximum of 15 sec per choice problem, whereas those in the other condition were given an unlimited amount of time. Time pressure was manipulated in a group setting (there were small groups of about 20 participants) by telling the respondents in the time pressure conditions that they had a certain amount of time to complete each decision. We then marked on the board each 5-sec increment, until the 15 sec were completed, and participants were told there was no more time and they had to move onto the next problem, where we repeated the procedure. Other research has also used such a method (e.g., Dhar & Nowlis, 1999; Stiensmeier-Pelster & Schurmann, 1993; Svenson & Benson, 1993; Verplanken, 1993). As a manipulation check, following Edland (1994), respondents were asked after completing all problems, “How much time pressure did you feel when making your choices?,” with responses on a 9-point scale ranging from 1 (no pressure) to 9 (very much pressure). Respondents were also asked, “How
“fast did you need to make your decisions,” with responses on a 9-point scale ranging from 1 (not at all fast) to 9 (very fast). In Study 2, time pressure was manipulated in a similar manner, and the same manipulation checks were assessed.

The choice set consisted of either (a) a middle-performance, middle-price option and a low-performance, low-price option or (b) these two options plus a high-performance, high-price option. For instance, in the product category of tires, one condition consisted of a choice set with “Option A” offering a warranty of 40,000 miles and a price of $64 and “Option B” with a warranty of 25,000 miles and a price of $45. The other choice set included these two options plus another one that had a warranty of 55,000 miles and a price of $83. Thus, “Option A” (in the two-option set) became the middle alternative in the choice set that offered all three alternatives. Respondents made choices in the product categories of tires, binoculars, and computers. As with tires, the options in other categories also differed along the two major dimensions of performance and price.

Results

Across the two time pressure conditions, the share of the middle option in the two-option set was tested against the share of the middle option in relation to the low-performance option in the three-option set (Simonson & Tversky, 1992). For instance, in the product category of binoculars, the middle performance brand was chosen by 71% of respondents in the two-option set when there was no time pressure (see Table 1). When this set was expanded to three options, the relative share of the middle brand compared to the low-performance brand increased to 81% (.46 / (.46 + .11)). Thus, in this case, without time pressure, the relative share of the middle brand increased in the three-option set, consistent with the compromise effect. Averaged across the three categories, the magnitude of the compromise effect without time pressure was .10 ((.42/.42+.11) – .69). However, when there was time pressure, the compromise option was less preferred in the three-option set, by .15 (77% vs. 62%). Therefore, the magnitude of the compromise effect diminished by .25 (.10 + .15) compared to the no time pressure condition, and this difference was highly significant, t(747) = 4.9, p < .01. In all three product categories, the magnitude of the compromise effect diminished under time pressure. Finally, the manipulation checks were averaged (α = .93) together and showed that, as expected, participants felt more time pressure when they had less time to make their decisions (6.6 vs. 3.6, p < .01). In the second study, the same manipulation checks showed that respondents felt more time pressure in the condition in which there was less time to make choices (p < .01).

The first study thus finds that time pressure decreases the compromise effect, as the relative attractiveness of the option with intermediate values is diminished. The results are consistent with an account that consumers who attempt to determine the best choice by focusing on compensatory comparisons among the alternatives are more likely to select the compromise option. Consequently, the shift to a more noncompensatory decision processing under time pressure results in fewer compensatory comparisons and a lower likelihood of selecting the middle option. Note that if the choice of the middle option in a three-option choice set was due to a desire to simplify or minimize effort, this would suggest that time pressure should increase the size of the compromise effect.

More generally, the first study suggests that the bias in favor of specific options arises not because participants are simplifying (i.e., making too few comparisons), but rather because they are making too many comparisons. Although the study focused on the effect of introducing a new option on relative preferences among alternatives that were available all along, our framework can be extended to consider shifts in relative preference even when no new alternatives are introduced. In particular, we focus on a choice set with one option that offers significant advantages on some dimensions and disadvantages

<table>
<thead>
<tr>
<th>Product Category</th>
<th>Options in the Set (Performance and Price)</th>
<th>Unlimited Time</th>
<th>Time Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Set 1</td>
<td>Set 2</td>
</tr>
<tr>
<td>Binoculars</td>
<td>High</td>
<td>71</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>58</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>42</td>
<td>13</td>
</tr>
<tr>
<td>Computers</td>
<td>High</td>
<td>79</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>79</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Tires</td>
<td>High</td>
<td>69</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>31</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 1

Study 1: Effect of Time Pressure on Choice of a Compromise Option

<table>
<thead>
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</table>

Note. Share of respondents (N = 250) choosing each option is shown in percentages.
on others, and another option that has average values on all dimensions, or an “all-average” option (these were referred to as enriched and impoverished options, respectively, by Shafir, 1993). Thus, this choice set is such that an all-average option is intermediate in terms of its valence on the features that are more extreme in the enriched option, and therefore the features of the enriched options can be viewed as an extreme option and the all-average option as a compromise option. Consistent with this assumption, Simonson and Nowlis (2000) showed that the all-average option is viewed as a safer choice and is more likely to be selected by participants who expect their decisions to be evaluated. Note that these are participants who may expend more effort in comparing the alternatives (of course, they might potentially differ on other dimensions from participants who do not expect to be evaluated).

If the preference for the “all-average” option is partly a consequence of resolving the difficulty in making compensatory trade-off comparisons between the two items, time pressure should again reduce the choice difficulty by unequally weighting such relational characteristics. The relative share of the two options should depend, however, on which features of the options receive the most weight under time pressure. If time pressure increases the focus on the negative features, the percentage of participants selecting the all-average option should increase under time pressure because of the extreme negative features of the enriched option. However, if time pressure increases the focus on the positive features, the percentage of participants selecting the all-average option should decrease under time pressure because of the extreme positive features of the enriched option. Some previous work suggests that negative features are generally more salient and attention-grabbing than positive features (Pratto & John, 1991; Wright, 1974). On the other hand, more recent studies on riskless choice find support for greater attention to positive features under time pressure (Edland, 1993; Svenson et al., 1990). As opposed to the perceptual account, the effort minimization account might simply predict an increase in the choice of the all-average option under time pressure as the “easy way out.” Study 2 is designed to examine the extent to which the market share of the all-average option increases or decreases under time pressure. Study 3 examines the effect of time pressure on both the compromise effect and the choice of all-average versus enriched options in order to examine the decision processes involved in the results of the first two studies.

STUDY 2: CHOICE OF AN “ALL-AVERAGE” OPTION

Method

Participants were 124 undergraduate marketing students fulfilling a course requirement. As in Study 1, time pressure was manipulated between participants. Participants in the time pressure condition were given a maximum of 12 sec per choice problem, whereas those in the other condition were given an unlimited amount of time. Respondents chose between an option that offered average features and an enriched option that offered both positive and negative extreme values on each of these features (see Figure 1). For example, “Restaurant A” offered “High Quality (4 stars); Long Wait (25 minutes); Wide Selection; Dull Atmosphere,” whereas “Restaurant B” offered “Average Quality (2.5 stars); Average Wait (10 minutes); Average Selection; Average Atmosphere.” Respondents made choices in the product categories of personal computers, restaurants, and calculators.

Results

The share of the all-average alternative decreased under time pressure. For example, in the product category of restaurants, 75% of respondents chose the all-average option when there was unlimited time to decide. When time pressure was induced, only 61% of participants selected the all-average option. Thus, in this category, time pressure reduced the choice of the all-average option by 14%. Averaged across all three product categories, the choice of the all-average option decreased by 17% when decisions were made with a limited amount of time (Table 2). A binary logit model (e.g., Dhar, Nowlis, & Sherman, 1999; Dhar & Sherman, 1996) was conducted across the three categories. The dependent variable was whether the all-average option was chosen and was a function of (a) time pressure and (b) the two-way interactions between the time pressure manipulation and the three product categories. Consistent with an increase in noncompensatory processing and a focus on positive feature under time pressure, there was a main effect of time pressure on the choice of the all-average alternative, \( \chi^2(1, N = 372) = 8.29, p < .01 \), such that time pressure re-

![FIGURE 1](image)

Imagine that you are going out to a restaurant, and are considering the following options.

<table>
<thead>
<tr>
<th>Restaurant A</th>
<th>Restaurant B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Features:</strong></td>
<td><strong>Features:</strong></td>
</tr>
<tr>
<td>High Quality (4 stars)</td>
<td>Average Quality (2 stars)</td>
</tr>
<tr>
<td>Long Wait (25 minutes)</td>
<td>Average Wait (10 minutes)</td>
</tr>
<tr>
<td>Wide Selection</td>
<td>Average Selection</td>
</tr>
<tr>
<td>Dull Atmosphere</td>
<td>Average Atmosphere</td>
</tr>
</tbody>
</table>

Which restaurant would you choose? __________

FIGURE 1  Example product category from Study 2.
duced the attractiveness of the all-average option. The results also support the premise that the all-average option was more likely to be selected by individuals who focused on compensatory trade-offs among the relational characteristics of the options under consideration rather than by individuals who were attempting to reduce cognitive effort.

The results of the first two studies support the excessive focus on local trade-offs account rather than the choice simplification account of context effects. However, these studies had several limitations. First, although utmost care was taken to ensure that participants followed the instructions about the amount of time to be spent on each problem, we cannot state with certainty that participants followed the instructions exactly as described because the tasks were conducted using a paper-and-pencil questionnaire. Second, although the results are consistent with the proposed shift in more noncompensatory trade-off comparisons under time pressure, we did not directly observe the processing strategies that were used by the participants. One advantage of observing the process data is that any changes in strategy can then be used to perform a mediational test for the proposed differences in the choices. Implicit in our analysis is the notion that compensatory decision processes of local comparisons make choices difficult and that such processing differences generally result in an increase in the attractiveness of compromise and all-average options. Study 3 uses the Mouselab program (Johnson, Payne, Schkade, & Bettman, 1993) to measure the processing changes and to replicate and extend the results of the first two studies. In sum, we predict that, as in the first study, time pressure should reduce the compromise effect. In addition, the degree of compensatory decision processing should mediate the effect of time pressure on the compromise effect. Finally, consistent with the results of the second study, consumers should make fewer compensatory comparisons and pay more attention to positive features than negative features when deciding under time pressure.

### STUDY 3: DECISION PROCESSES UNDERLYING CONTEXT EFFECTS

#### Method

Study 3 has a number of purposes. First, we wanted to be able to replicate the results from the first study using a more controlled Mouselab methodology. Second, we wanted to show that the results from Study 1 could be explained in terms of systematic changes in decision strategy. In particular, we predicted that the use of less effortful, noncompensatory strategies would mediate the effect of time pressure on the choice of a compromise alternative. In addition, we wanted to test whether participants would focus more on positive features when choosing under time pressure, which would provide process support for the results obtained in the second study.

Participants in this study were 139 undergraduate marketing students fulfilling a course requirement. Each participant made choices in four product categories, two of which were designed to test the compromise effect (binoculars and portable barbecue grills), and two of which were designed to test the choice of an all-average option (portable computers and calculators; see Figure 2 for an example). Time pressure was manipulated between participants across the four tested categories. Thus, one group of participants made four choices (one in each of the four product categories) all under time pressure. Another group made the same choices but with unlimited time. We first describe the procedure used to test the compromise effect, and then we describe the procedure used to test the choice of an all-average option.

For the two categories testing the compromise effect, participants in the time pressure condition were given a maximum of 15 sec, as in Study 1. Each of the alternatives was described on a number of different features. For example, the portable barbecue grills were described in terms of the following features: cooking area, weight, ease of use ratings, and durability ratings. Participants chose between either Grill A and Grill B, or these grills and Grill C. Grill A offered a cooking area of 300 square in., weight of 6 pounds, ease of use rating of 80, and durability rating of 94. The ratings were described as coming from Consumer Reports and were on a scale from 0 to 100. Grill B offered a cooking area of 380 square in., weight of 10 pounds, ease of use rating of 86, and durability rating of 89. Grill C offered a cooking area of 460 square in., weight of 14 pounds, ease of use rating of 92, and durability rating of 84. Thus, the addition of Grill C renders Grill B the intermediate option on all dimensions.

For the two categories used to test the choice of an all-average option, participants in the time pressure condition were given a maximum of 12 sec, as in Study 2. Unlike Study 2, however, participants were now asked to indicate which of the two options (the enriched or the all-average item) they would not choose. We wanted to determine whether framing the decision task as “not choose” would increase the market share of the all-average option because of the relative salience of the extreme negative features of the enriched option. On the other hand, if a noncompensatory strategy involves a predominant focus on the positive features of the alternatives, then we should still observe a reduction in the market share of the all-average option under time pressure. This possibility is, in fact, suggested by

<table>
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<tr>
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<th>Unlimited Time</th>
<th>Time Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portable computer</td>
<td>75</td>
<td>50</td>
</tr>
<tr>
<td>Restaurant</td>
<td>75</td>
<td>61</td>
</tr>
<tr>
<td>Calculator</td>
<td>79</td>
<td>67</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td>59</td>
</tr>
</tbody>
</table>

*Note. Share of respondents (N = 124) choosing the all-average option is shown in percentages.*
Svenson et al. (1990), who found that positive aspects gain in importance under time pressure. They suggested that participants under time pressure or cognitive resource limitations employ a “Max” rule in which the alternative that is best on certain attributes is chosen. Thus, participants choosing between calculators were asked, “Which calculator would you NOT choose?” The two alternatives in each category were described on several features. For example, the calculators were described along the following four dimensions: reliability, number of function keys, sturdiness, and price. Calculator A offered high reliability, few function keys, very sturdy design, and a high price. Calculator B offered average reliability, average number of function keys, average sturdiness, and an average price.

The experiment was conducted using the Mouselab program (Johnson et al., 1993), a computer-based process tracing technique. Information was displayed in closed boxes presented in an Option x Attribute matrix, where participants could reveal the information in each box by moving a mouse-controlled cursor to the relevant box. Mouselab recorded which boxes were opened, in what sequence, and how much time was spent in each box. Participants began the experiment with instructions on how to access information in the boxes by using the mouse. They then completed a practice problem before making decisions in each of the four categories. For those in the time pressure condition, a small circle appeared on the screen and ticked down as the time available was reduced. If participants did not make a choice before the time was used, the program beeped, instructed them to “please make a choice or indicate a value,” and would not allow them to open any more boxes. Finally, after all choices were made, participants were asked as a manipulation check, “How much time pressure did you feel when making decisions?,” and responded on a scale ranging from 0 (no time pressure) to 10 (great time pressure; e.g., Dhar & Nowlis, 1999).

![Example product category from Study 3.](image)

**FIGURE 2** Example product category from Study 3.

Welcome! On the next screens you will be asked to make several decisions and to answer more questions during this experiment. There are no right or wrong answers. You will only need the mouse in front of you to complete the experiment. In order to go on, please move the cursor into the box at the bottom of the screen and click a mouse button.

*(Next page)* During this experiment, you will make decisions based on information you collect from the computer screen (subjects are then given additional information on using the Mouselab program and complete a practice problem. Also, subjects making choices under time pressure are given instructions for doing this, and the screen where the choices are made also shows a small clock in the upper left hand corner which ticks down as time advances).

*(Next page)* Next, imagine that you are shopping for a BBQ grill. One of the features, ease of use ratings, is taken from Consumer Reports where “0” means very hard to use, and “100” means very easy to use. Another feature, durability ratings, is also taken from Consumer Reports where “0” means not at all durable, and “100” means very durable. You may now proceed to the next question. At the bottom of the next screen, you will be asked to indicate which of the grills you would buy.

<table>
<thead>
<tr>
<th></th>
<th>Grill A</th>
<th>Grill B</th>
<th>Grill C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooking area</td>
<td>300 sq. inches</td>
<td>380 sq. inches</td>
<td>460 sq. inches</td>
</tr>
<tr>
<td>Weight</td>
<td>6 pounds</td>
<td>10 pounds</td>
<td>14 pounds</td>
</tr>
<tr>
<td>Ease of use</td>
<td>80</td>
<td>86</td>
<td>92</td>
</tr>
<tr>
<td>Durability</td>
<td>94</td>
<td>89</td>
<td>84</td>
</tr>
</tbody>
</table>

Which grill would you buy?

Choose one: Grill A  Grill B  Grill C
As with other time pressure research that has used Mouselab (e.g., Payne et al., 1988), we calculated various measures that can provide evidence of the degree to which participants use noncompensatory or compensatory processing strategies. First, we calculated the number of acquisitions of each piece of information, referred to as ACQ. Second, we measured the average time spent acquiring each piece of information, known as TPERACQ. Third, we calculated the variance in the proportion of time spent on each attribute, referred to as VAR. Finally, we calculated the relative degree to which participants made attribute or alternative-based transitions. For example, if a participant first checked the cooking area of one grill and then the cooking area of the other grill, this would be coded as an attribute-based transition, but if they first checked the cooking area of one grill and then the weight of that same grill, this would be coded as an alternative-based transition. The measure we used is the number of alternative-based transition minus the number of attribute-based transitions divided by the total number of alternative-based and attribute-based transitions combined, known as PATTERN (see, e.g., Payne, 1976; Payne et al., 1988). PATTERN can range from +1.0 to −1.0, with more negative values representing more attribute-based processing. Prior research has found that, under time pressure, there are (a) fewer ACQ, (b) reduced TPERACQ, (c) greater VAR, and (d) a more negative PATTERN (e.g., Payne et al., 1988). We expect to replicate these results to show that processing indeed was following more of a noncompensatory process under time pressure.

However, of more importance to this article is to show through a mediation analysis that the greater use of noncompensatory local comparisons under time pressure is indeed what might be driving the results. In particular, to show mediation, we must demonstrate three relations (Baron & Kenny, 1986). First, we must show that the independent variable, time pressure, significantly affects the dependent variable, choice of the compromise option. Second, we must show that the processing measure significantly affects the dependent variable, choice of the compromise option. Third, we must show that the effect of time pressure on choice of the compromise option is reduced or eliminated if the processing measure is also included.

Results Pertaining to the Choice of a Compromise Option

**Choice results.** We first examined the results relating to the choice of the compromise option. Consistent with the results from Study 1, respondents were less likely to choose the compromise option under time pressure. Averaged across the two tested categories, without time pressure the choice of the compromise option increased by 23%. However, with time pressure, the choice of the compromise option increased by only 4%. The difference between these two effects is significant, $\chi^2(1, N = 278) = 4.35, p < .05$. The results were in the expected direction for both categories.

**Processing results.** We next examined the process measures (see Table 3). As expected, participants acquired fewer pieces of information (ACQ) when making decisions under time pressure ($M = 18.1, M_{14.5}$), $F(1, 276) = 20.0, p < .001$. In addition, they spent less time per each acquisition (TPERACQ) when making decisions under time pressure ($M = 1.31, M_{1.04}$), $F(1, 276) = 38.3, p < .001$. Furthermore, as expected, there was a greater degree of attribute-based processing (PATTERN) under time pressure ($M = -.304, M_{-.178}$), $F(1, 276) = 8.5, p < .01$. These results are consistent with other research on time pressure (Payne et al., 1988). Finally, in terms of the variance spent examining each attribute (VAR), there was greater variance under time pressure, although this result was not significant ($M_{.024}, M_{.021}$), $F(1, 276) = .77, p > .40$.

Our framework suggests that choice under time pressure will result in increased noncompensatory processing, which in turn will result in decreased preference for the compromise alternative. We completed the mediation analysis, using PATTERN, which has previously been shown to vary with the mode of processing (e.g., Payne et al., 1988). As mentioned earlier, we found that PATTERN was significantly affected by time pressure, satisfying the first criteria for mediation. Next, we found that PATTERN has a marginally significant relation on choice of the compromise alternative, $\chi^2(1, N = 278) = 2.99, p < .10$, which partially satisfies the second criteria for mediation. Finally, the third criterion of mediation receives support, as the effect of time pressure on choice of the compromise option is weaker when PATTERN is included as a variable, $\chi^2(1, N = 278) = 2.23, p > .10$; versus $\chi^2(1, N = 278) = 4.35, p < .05$, as mentioned earlier. Thus, consistent with our prediction, this analysis shows that PATTERN mediates the effect of time pressure on choice of the compromise alternative. Overall, the results support the notion that the preference for the compromise option is greater among participants who are making more compensatory comparisons rather than avoiding the effort required in making the choice.

Results Pertaining to the Choice of an All-Average Option

We next examined the results relating to the choice of an all-average option. Averaged across the two tested categories, participants were less likely to choose the average al-

### TABLE 3

<table>
<thead>
<tr>
<th>Dependent Measure</th>
<th>No Time Pressure</th>
<th>Time Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACQ</td>
<td>18.1</td>
<td>14.5</td>
</tr>
<tr>
<td>TPERACQ</td>
<td>1.31</td>
<td>1.04</td>
</tr>
<tr>
<td>VARIANCE</td>
<td>0.021</td>
<td>0.024</td>
</tr>
<tr>
<td>PATTERN</td>
<td>−0.178</td>
<td>−0.304</td>
</tr>
</tbody>
</table>

*Note.* ACQ = number of information boxes opened; TPERACQ = time per information acquisition; VARIANCE = variance in the proportion of time spent on each attribute; PATTERN = index reflecting degree of attribute-based (−) and alternative-based (+) processing.
alternative when choosing under time pressure. Without time pressure, the average alternative was selected by 60% of the participants. With time pressure, however, the average alternative was selected by only 41% of participants. The results were in the expected direction in both categories. We tested this effect in the same manner as in Study 2 and found the effect to be significant, $\chi^2(1, N=278) = 5.12, p < .01$.

We next investigated the ratio of positive to negative features that were examined. To do this, we constructed a value for each participant that was the number of positive features examined minus the number of negative features examined divided by the total number of positive and negative features examined, which has been referred to as VAL (Dhar et al., 1999). This value is similar in style to PAT-TERN. The value of VAL can range from +1.0 to –1.0, with positive numbers indicating a greater focus on positive features and negative numbers indicating a greater focus on negative features. An analysis of variance model was then constructed with this ratio as the dependent measure and with the time pressure manipulation as the independent variable. Consistent with our results, consumers focused more on positive features than negative features when deciding under time pressure ($M = .024$ vs. $-0.039$), $F(1, 276) = 4.66, p < .05$. Although this is inconsistent with some prior work on time pressure, it is supported by other recent findings. We speculate further in the discussion section on why this might be the case.

GENERAL DISCUSSION

The goal of this article was to improve our understanding of the consumer psychology that underlies the effect of choice context on the relative preference among alternatives. Because effects of choice context violate the assumptions of rational choice such as the principle of value maximization, it is obviously important to understand the psychological principles and mechanisms that drive these effects. Researchers have identified two alternative frameworks to explain the manner in which preferences are constructed. The first of these is the effort–accuracy approach, which proposes that consumers select decision strategies by making a trade-off between the accuracy of the decision and the desire to minimize effort. The specific context, including the number and the features of the available alternatives, can alter the strategy from one of careful and systematic processing of information to one of greater simplification, thereby affecting the choice outcome. The second approach assumes that, although consumers typically work hard to arrive at the best possible decision, they often focus on local comparative aspects of the alternatives, and this adds difficulty and complication to the choice, as more global assessments of the alternatives are ignored. Specifically, changes in the choice context can alter the local comparisons, and in so doing can alter the outcome of the choice process.

To test these two alternative accounts underlying context effects, the effects of time pressure on choices were examined. The two accounts make quite different predictions about the consequences of time pressure. Based on the notion of choice simplification, with no time pressure, participants are less likely to engage in a careful and complete analysis of the available options in the three-option choice set as the choice complexity increases. According to the effort–accuracy framework, with limited time for analysis, they should expend even less effort and be even more likely to adopt simple heuristics to minimize effort. This change in strategy should result in greater likelihood of certain context effects. On the other hand, the comparative focus approach suggests that, without time pressure, consumers who focus primarily on salient local features and make more compensatory comparisons should be more susceptible to particular context effects. With time pressure, however, less focus will be put on carefully weighing the comparative information, greater attention will be given to the more global assessments, noncompensatory strategies will be adopted, and participants will thus be less susceptible to traditional context effects.

Two well-documented context effects, the compromise effect and the tendency to choose all-average as opposed to enriched options, were examined in three experiments. The results supported the perceptual account. It appears that, under time pressure, consumers give less weight to local, salient, comparative features, and, in addition, they also focus more heavily on the positive aspects of the alternatives. This led to a reduction (and even a reversal) of the compromise effect and to a reduced tendency to choose an all-average option rather than an enriched option. Importantly, Study 3 presented process data to support both the mediation of simplifying, noncompensatory strategies for the effects of time pressure on the compromise effect as well as the additional focus on positive aspects of the alternatives under time pressure.

Theoretical Implications

It is important to note that, although time pressure reduces these context effects, we are not claiming that time pressure makes one a more accurate judge or a better decision maker. For example, in Study 1, without time pressure, there is a strong tendency to choose the compromise alternative when a third item is added to the set. This tendency for the addition of a new alternative to change the relative preference for the other two alternatives might be considered a bias in judgment. With time pressure, this tendency to favor the compromise candidate disappears. What we see, however, is now a tendency to reduce the relative market share of the compromise candidate. This is just as much a judgmental bias. Thus, the purpose of these experiments was not to determine whether time pressure makes one a better or worse decision maker, but
rather to help understand the psychological processes and mechanisms through which context effects ordinarily occur.

However, it is interesting to discuss, in the context of our findings, the general issue of the effects of time pressure on the quality of decision making. The typical “common sense” bounded rationality view of time pressure (or similar manipulations such as cognitive busyness) is that this manipulation will lead to more “quick and dirty” decisions and thus will reduce the accuracy of such decisions. The reality appears to be more complex. It is fair to say that having more time and resources for a choice, even when a consumer is highly motivated to do a comprehensive and effective analysis, does not always produce better decisions. Such a conclusion is, in fact, consistent with several related findings in the literature. For example, one might think that doing a reasoning analysis or a careful introspection about why particular items are liked could only improve decision making and lead to the expression of attitudes that are more predictive of subsequent behavior. Wilson and his colleagues reported, across many experiments, that reasoning and introspection actually reduce the level of attitude-behavior consistency (Wilson, Dunn, Kraft, & Lisle, 1989) and lead to decisions that are less satisfying and less optimal (Wilson & Schooler, 1991).

Similarly, Schooler and his colleagues (Dodson, Johnson, & Schooler, 1997; Schooler & Engstler-Schooler, 1990) asked participants to think carefully about and to try to accurately describe objects that they had recently seen, such as a color chip or a person who committed a staged crime. Surely devoting more time and resources to analyzing what one has just seen would improve subsequent recognition of the objects. Again, exactly the opposite was found. Participants who had to do the recognition task without any previous analysis or description of the objects were far more accurate in their recognition. In fact, the only way to eliminate the poor performance of participants who had engaged in introspection and reasoning was to force them to do the recognition task under time pressure. Other recent work also supports the idea that increases in processing effort can reduce decision quality. Tetlock and his colleagues demonstrated that increases in accountability lead to greater processing effort, while at the same time leading to increases in judgmental biases such as the dilution effect (Tetlock & Boettger, 1989) and the status quo bias (Tetlock & Boettger, 1994). Similarly, work by Buehler, Griffin, & McDonald, 1997; Buehler, Griffin, & Ross, 1994) showed that an increase in processing effort can increase proneness to the planning fallacy.

Schooler and Engstler-Schooler (1990) interpreted their effects as due to the fact that reasoning changes what is basically a visual process (recognizing a color or a face) into a verbal process. Any time we try to think in verbal terms about things that are nonverbal in nature, we will interfere with our ability to accurately recognize them. Preferences, too, might be considered to a large extent nonverbal (Zajonc, 1980). By verbalizing about preferences, we might obscure the basically affective nature of preferences and make decisions that are suboptimal and unsatisfying. Without time pressure, comparative aspects are the focus of attention, and such careful local trade-off comparisons might obscure the more global assessments and less verbalizable aspects of the alternatives that in fact are more important to the choice.

Just as having greater time and more cognitive resources is not always good for accurate and satisfying decision making, it might also be true that having less time for decisions might not always be bad. Recent work by Sherman, Lee, Bessenoff, and Frost (1998) investigated the effects of limited cognitive resources on the stereotyping process. The traditional view has been that stereotypes are used to ensure efficient processing of information and that under the pressure of limited time or limited resources, the social perceiver will rely more on stereotypes (Bodenhausen, 1990; Macrae, Hewstone, & Griffiths, 1993) and will thus preserve precious resources (Macrae, Milne, & Bodenhausen, 1994). In addition, this efficiency is thought to be obtained by filtering out any information that is inconsistent with the stereotype and by processing only stereotype consistent information. This kind of processing will serve to harden the stereotype and to render it resistant to change. Sherman et al. (1998), on the other hand, proposed that under the pressure of limited time or resources, an efficient system will actually attend more to unexpected, inconsistent information and less to stereotype consistent information. This allows the system to maintain plasticity, and in the long run such processing will allow stereotypes to change in the face of disconfirming information. Empirical results supported this system of encoding flexibility under cognitive load. Thus, as suggested also by several of our results, time pressure or limited resources can reduce the tendency to fall prey to traditional biases of judgment or information processing.

In short, the findings of the current studies, along with results of past research, indicate that effort does not guarantee an increase in accuracy. The relation between effort and accuracy is likely to depend on many other factors. For example, Mantel and Kardes (1999) found that this relation depends on the nature of the information used and the type of cognitive operations performed on the information. Individuals high in the need for cognition were more likely to engage in effortful, attribute-based processing and were more susceptible to biases involving direction-of-comparison effects. Gilbert and Krull (1988) suggested that either too little or too much processing of relevant information can result in bias and error (see also Meyers-Levy & Tybout, 1997, for a view that moderate levels of processing are optimal).

Another interesting aspect of our findings was the increased attention to positive features under time pressure, even when participants were asked to indicate which item they would not choose, a manipulation that was expected to render more salient the negative features of the items. Clearly there is a precedent in the literature for greater weight to generally be given to the negative features of objects (e.g., Pratto & John, 1991; Wright, 1974). However, recent evidence is
not consistent with the notion that negative features will always receive greater attention and greater weight in the judgment process. For example, Roskos-Ewoldsen and Fazio (1992) reported that objects toward which participants had automatically accessible attitudes drew special attention in an array of objects when time for processing was highly limited. This was true for both accessible positive and accessible negative attitudes, with no greater attention given to objects that automatically activated negative attitudes. Svenson et al. (1990) reported that, in a choice situation, time pressure in fact increased the focus on positive features of the alternatives. We support such findings and obtain these results even when the choice task was designed to increase salience of negative features. Finally, research has shown that consumers are more likely to choose higher quality brands and brands that offer more features over lower price brands when choosing quickly (Nowlis, 1995). If high perceived quality can be considered more of a positive dimension than low price, these results are also consistent with our findings.

Marketing Implications

Marketers need to understand how to maximize their sales in an environment where consumers are increasingly hurried and stressed (Cristol & Sealey, 1996). Our research suggests that the choice set can play an important role in determining which items are chosen when decisions are made in a hurry. In particular, the advantage that a compromise option has when decisions are made without time pressure can disappear and even be reversed when choices are made quickly. In addition, when a brand is seen as an all-average alternative, it also loses share in such conditions. Thus, certain selling environments might be more likely to benefit enriched or extreme brands when choices are made with a limited amount of time. Conversely, retailers can organize in-store displays to encourage or discourage comparisons that enhance or attenuate context effects (e.g., Nowlis & Simonson, 1997). For example, a lower priced store brand can be placed next to a higher priced national brand on the shelf, and price comparisons can be encouraged. In addition, with the growth of sales over the Internet, it is becoming increasingly easy for marketers to alter the context in which brands are seen.

Several general implications also follow for retailers and other direct marketers who are mainly concerned with increasing overall revenues and profitability as opposed to the purchase of a specific brand. For instance, an increase in product category variety might reduce the selection of intermediate quality alternatives for categories in which consumers make decisions quickly, but the reverse might be the case for categories where consumers spend more time. Conversely, strategies that encourage consumers to make careful trade-off comparisons between different alternatives might backfire by making them more susceptible to certain contextual factors. To the extent that different brands have different profit margins, retailers should take into account the implications of category context on choice and profitability.

The notion of constructive preferences raises the question of how much time to spend when making purchase decisions. From a normative perspective, choice should be determined by selecting the alternative that has the highest overall value independent of the choice context. Systematic shifts in preferences either with or without time pressure are problematic. Descriptively speaking, the answer to this question might depend on a consumer’s propensity to focus on relational characteristics. If you tend to focus on local trade-off comparisons, having less time might make you more consistent in your choices. Alternatively, if you primarily make global evaluation of each alternative prior to choice, having more time might make you more accurate.

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REFERENCES


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