Abstract—The present studies show that preferences change systematically depending on the global context and the measurement task. Subjects evaluated apartments described by monthly rent and distance to campus using two different tasks (choices and attractiveness ratings) in two different global contexts (one with a narrow range of rents and a wide range of distances, and the other with a wide range of rents and a narrow range of distances). With the task held constant, preference orders for the same pair of apartments reversed in the two different contexts. Similarly, with the context held constant, preference orders for the same pair of apartments reversed in the two tasks. Taken together, the effects are startling. Out of 25 apartments common to all four conditions, the preference rank of the apartment that was most expensive and closest to campus ranged from the 28th percentile to the 80th percentile. We argue that, in the present experiments, the global context influences the scale values (or the perceptions of the attributes), and the task influences the weights (or the psychological importance) of the attributes.

An important goal in many areas of social science is the accurate measurement of preference. Pollsters want accurate measures of voters' preferences to assist politicians and inform the public. Marketing researchers want accurate measures of consumers' preferences to guide marketing and production strategies. Decision theorists want accurate measures of preferences to help people make good decisions and select the best options.

Preferences are easy to measure when one option dominates the others or when one option has a decisive advantage. However, the measurement of preferences is more complex when trade-offs are difficult or when uncertainties are hard to specify. In these cases, preferences can be influenced by seemingly inconsequential factors such as the task used to infer preference and the global context in which the alternatives are embedded. This article explores some ways in which both context and task influence preference measurement.

LOCAL CONTEXTUAL EFFECTS

Preferences do not occur in a vacuum; they are always formed relative to a context. Some decision researchers distinguish between two types of contexts in choice tasks: the local context and the global context. The local context is formed by the options available in any given choice set, and the global context refers to all possible choice sets or the entire set of stimuli. One well-known local contextual effect was demonstrated by Huber, Payne, and Puto (1982). Subjects were first presented with pairs of nondominated options and indicated which option they preferred. For example, consider two beer brands, A and B, varying in price and quality. A is higher in quality than B, but B is cheaper than A. Subjects are asked to make a choice between beers. Then they are presented with another choice set consisting of A, B, and another brand, C. C costs the same as B, but is lower in quality. Therefore, B dominates C. According to most theories of choice, the addition of C to the choice set should not change the relative attractiveness of A and B. However, Huber et al. (1982) found that after C was added to the choice set, relatively more people choose B over A. Several psychological explanations have been examined to account for this and other local contextual effects (Lakshmi-Ratan, Lanning, & Rotondo, 1991; Marley, 1991; Tversky & Simonson, 1993; Wedell, 1991).

GLOBAL CONTEXTUAL EFFECTS

The global context reflects the entire set of choices, as well as the context that subjects bring to the laboratory (i.e., subjects' past and present experiences). For example, responses to a prior task can influence the global context. Strack, Schwarz, and Gschneidinger (1985) found that subjects' ratings of general life satisfaction were higher after they reminisced about positive life events and lower after they reminisced about negative life events. In addition, Turner and Krauss (1978) found that in national surveys, confidence in federal institutions was lower if the confidence ratings were preceded by items examining political alienation than if ratings were presented alone.

The distribution of trials in a given task can also influence the global context. Parducci (1968, 1974) investigated effects of the global context on single-attribute judgments. Using a variety of different continua, he demonstrated that judgments of the same stimulus in different global contexts can vary in highly predictable ways. For example, in his experiments, a 50-g weight was judged heavy in one context but light in another, a 3-in. square was judged large in one context but small in another, and a 1$^\circ$ payoff was judged satisfying in one context but dissatisfying in another.

Multiattribute Ratings

Global contextual effects can occur with multiattribute judgments as well as single-attribute judgments. Parducci (1968) demonstrated that the judged morality of a relatively neutral deed depended on whether the surrounding context included primarily good deeds or bad deeds. Furthermore, Russell and Fehr (1987) found that the emotion conveyed by a picture of a
woman’s face depended on the face that preceded it. When the preceding face was morose, the neutral face appeared happy, and when the preceding face was jubilant, the neutral face appeared sad.

In another example, we (Mellers & Cooke, 1994) asked subjects to rate the attractiveness of apartments based on monthly rent and distance to campus. In one context, the overall range of rents was narrow, and the range of distances was wide. In another context, the widths of the attribute ranges were reversed. A subset of 25 apartments was common to both global contexts. Attractiveness ratings (judged on a scale from 1 to 50) were consistent in both range contexts. That is, the inconsistent ratings are on the off diagonal. In 55% of the pairs, ratings reversed across contexts, and all of the reversals occurred in the same direction. When the range of rent was narrow (and the range of distance was wide), people rated the cheaper apartment as more attractive, and when the range of distance was narrow (and the range of rent was wide), the closer apartment was rated more attractive. In sum, the global range has a strong and systematic effect on attractiveness ratings of multiattribute stimuli.

Multiattribute Choices

Global range effects are not limited to rating tasks. In another experiment (Cooke & Mellers, 1994), we gave two groups of subjects pairs of apartments described by distance and rent and asked them to indicate which apartment they preferred. Again, each group of subjects had a different global range context. In one context, the range of rent was narrow, and the range of distance was wide; in the other context, ranges were reversed. Subjects in each group made many choices between nondominated pairs of apartments, 100 of which were common to both contexts.

For each context, we derived a preference order over the 25 common apartments based on the 100 choices that were identical in both contexts. These preference orders are shown in Figures 2a and 2b. Arrows show comparisons between pairs of apartments that differ by $50 and 8 min. These comparisons best highlight the rank-order changes across contexts. Arrows tend to point up in Figure 2a and down in Figure 2b, as found earlier with ratings: When the range of rent was narrow, people preferred cheaper apartments, but when the range of distance was narrow, they preferred closer apartments. Figure 2c shows comparisons between all 100 pairs of apartments. For 80% of the pairs, preferences were consistent across contexts, but 20% of the time, preferences reversed. Once again, all of the reversals occurred in the same direction.

In summary, common attribute levels presented in a narrow range have a greater effect on choices than common levels presented in a wide range. These global range effects occur for multiattribute choices and ratings.

Some researchers argue that experiments should be done
Task and Context in Preference Measurement

<table>
<thead>
<tr>
<th>A. DISTANCE (Wide)</th>
<th>B. DISTANCE (Narrow)</th>
<th>C. NARROW RENT</th>
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<tr>
<td>400</td>
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<td>10</td>
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<tr>
<td>0%</td>
<td>67%</td>
<td>0%</td>
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</table>

Fig. 2. Contextual effects in choices. Preference orders are shown for a context in which the range of rent was narrow and the range of distance was wide (a) and a context in which attribute ranges were reversed (b). The rankings range from 1, for the least preferred apartment, to 25, for the most preferred. The pattern of preference orders for all 100 nondominated pairs is shown in (c).

Fig. 3. Experimental design for studying contextual effects in choice with only three trials—two contextual trials and one test trial. Open circles connected by lines represent the two contextual trials; A and B are the two apartments used in the test trial in each context.

Theoretical Accounts

The global context, arguably an irrelevant factor, produces systematic reversals of preferences for both ratings and choices. What psychological theories describe these results? Parducci's (1968, 1974) range-frequency theory can describe the effects. Parducci assumed that ratings of stimuli differing along a single dimension were predictable from range and frequency principles. According to the range principle, subjects map the stimuli across the range of responses in a linear fashion. Any particular stimulus difference that appears in both contexts produces a greater difference in judgments when the global range is statistically significant ($z = 3.8$). Thus, changes in attribute ranges systematically influence preferences, even when the global ranges are established with only two trials.

1. All tests were performed with an alpha level of .05.
narrow than when the global range is wide. The discriminability of the stimuli ($d'$) is affected in the same way (Parducci & Perrett, 1971).

We have examined extensions of range-frequency theory for tasks in which subjects combined two or more attributes (Mellers & Cooke, 1994). For these multiattribute stimuli (apartments), global contextual effects due to attribute range could, in principle, influence either the psychological importance of each attribute (weight), the perception of the attribute levels (scale values), or both.

Weight theories and scale theories of contextual effects for ratings make qualitatively different predictions in some experimental designs (Birnbaum & Stegner, 1979). We have found that changes in attribute range do not have much influence on weights, but they do influence the perceptions of the attributes in a fashion consistent with range-frequency theory. Estimated scale values associated with the same attribute levels spanned a larger subjective interval when the global range was narrow than when the global range was wide.

Although it is more difficult to separate weights from scale values in choice tasks than rating tasks, one can argue by analogy that variations in the global range influence the scale values in choice tasks as well as rating tasks. Given the similarity of the results for ratings and choices, a common locus for attribute range effects seems likely.

**TASK EFFECTS**

Preferences are always inferred from responses to a task, and researchers have long known that they can manipulate preferences depending on how they ask the question. One of the first examples of preference reversals based on task effects was provided by Lichtenstein and Slovic (1971), who constructed pairs of gambles matched on expected value. Gambles differed in their probabilities and payoffs. For example, one gamble, referred to as the P-Bet, had a large probability of winning a relatively small amount, and the other gamble, the S-Bet, had a small probability of winning a relatively large amount. Subjects were presented with pairs of gambles and chose the gamble they preferred to play in each pair. In addition, they assigned a selling price to each gamble separately.

If preferences had been consistent across tasks, the gamble chosen in each pair would have also received the higher selling price. However, Lichtenstein and Slovic (1971) found that subjects tended to choose the P-Bet in the choice task, but assigned a higher price to the S-Bet in the pricing task. Two decades of research on preferences have demonstrated that such reversals are surprisingly robust (Slovic & Lichtenstein, 1983) and occur systematically across a variety of task combinations, such as choices versus ratings (Goldstein & Einhorn, 1987; Mellers, Chang, Birnbaum, & Ordoge, 1992), and buying prices versus selling prices (Birnbaum, Coffey, Mellers, & Weiss, 1992). Furthermore, preference reversals continue to occur even when subjects are financially motivated to be consistent (Grether & Plott, 1979).

**Preference Reversals**

A comparison of the data in Figures 1 and 2 shows that preferences depend on the method of elicitation, as well as the context. Figure 4 shows the data from Figures 1b and 2b again in order to illustrate how preferences inferred from ratings and choices differ for a given context (i.e., narrow range of distance and wide range of rent). Reversals of preference across tasks are best illustrated with apartments that differ by $50 and 4 min. Arrows point down for the rating task (Fig. 4a); people tended to rate closer apartments as more attractive than cheaper ones. Arrows point up for the choice task (Fig. 4b): people chose cheaper apartments over closer ones when confronted with direct comparisons.

Figure 4c presents preferences for all 100 pairs of apartments. Preferences are said to be consistent when subjects rate a particular apartment within a pair as more attractive and select that apartment in a direct choice. Preferences were inconsistent in the majority of pairs (56%), and all reversals were in the same direction. In the choice task, cheaper apartments were preferred to closer apartments; and in the rating task, closer apartments were preferred to cheaper ones. Similar reversals of preferences were found in the other context (Figs. 1a and 2a).

Why might these reversals occur? It seems quite plausible that when comparing closer apartments with cheaper apartments, students would rate closer apartments as more attractive. Closer apartments are usually more convenient. However, if closer apartments are more attractive, why are they not se-

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**Fig. 4.** Task effects with ratings (a) and choices (b) when the range of rent was wide and the range of distance was narrow (from Figs. 1b and 2b). The pattern of preference orders for all 100 nondominated pairs is shown in (c).
selected in the choice task? Perhaps students want to save their money; they prefer to spend less on monthly rent. But if they want to save money, why do they not rate cheaper apartments as more attractive? These two tasks may highlight different features of the apartments, with attractiveness ratings representing preferences under no constraints and choices representing preferences with realistic aspirations. But nothing in the task instructions guided subjects to take those different points of view.

**Theoretical Accounts**

Unfortunately, no general theory of task effects has been proposed, presumably because psychological mechanisms for combining information depend on the stimuli as well as the tasks. Changing preferences in risky decision making (as opposed to riskless decision making, in the present case) can be described by a change-of-process theory (Mellers et al., 1992). In this account, preference reversals between ratings and choices are described by variations in the evaluation processes. People use one decision strategy to evaluate gambles in a choice task and a different decision strategy in a rating task, but scales remain constant across tasks.

To describe changing preferences in riskless decisions, we proposed a change-of-weight theory (Mellers, Weber, Ordonez, & Cooke, 1995). We hypothesized that the preference orders shown in Figure 4 are due to changes in the relative importance of the attributes in different tasks. This explanation is similar to one suggested by Tversky, Sattath, and Slovic (1988) to describe preference reversals between choice and matching tasks. Matching tasks require the subject to provide the value of an independent variable that makes two options equally attractive. For example, suppose that one highway safety plan saves 50,000 lives and costs $1 million. If another safety plan costs $2 million, how many lives should it save for the two plans to be equally attractive?

According to Tversky et al. (1988), preference reversals between choice and matching tasks can be described by the prominence hypothesis. The prominence hypothesis asserts that the more prominent attribute weighs more heavily in choice than in matching. People tend to make choices according to the most important dimension, but they match options by comparing trade-offs along dimensions.

We argue that in riskless decision making, preference reversals between choices and ratings may also be described by changes in attribute weights (Mellers et al., 1995). Furthermore, if the prominent attribute weighs more heavily in choices than in ratings, preference reversals should interact with judgments of the importance of the attributes (holding attribute ranges constant). When reversals occur, subjects who think that distance is more important than rent should choose the closer apartment over the cheaper apartment in the choice task, but judge the cheaper apartment as more attractive in the rating task. Conversely, subjects who think that rent is more important than distance should select the cheaper apartment in the choice task, but give the closer apartment a higher attractiveness rating.

We examined this hypothesis using a within-subject design in which the same subjects make both choices and attractiveness ratings (Cooke & Mellers, 1994). After each task, subjects judged whether rent or distance was more important. A few subjects reversed the relative importance of the attributes across tasks. A few others said the attributes were equally important in one or both tasks. The remaining subjects were divided into two groups, those who said that distance was more important than rent, and those who said that rent was more important than distance.

Figure 5 shows the patterns of preferences for these two groups. Counts of preference patterns were made over subjects and apartment pairs, and entries in both panels are percentages over 4,400 frequencies. Marginal preferences were consistent with judged importance. That is, subjects who said that rent was more important chose cheaper apartments more often, and, to a lesser extent, judged cheaper apartments as more attractive. Subjects who said distance was more important selected closer apartments more often and rated them more attractive. What about preference reversals?

Preference reversals varied depending on which attribute was judged more important. When preferences reversed, the apartment that was superior on the attribute judged more important was chosen, but the other apartment was rated more attractive. That is, subjects who said that rent was more important chose the cheaper apartment and rated the closer apartment as more attractive. This difference was statistically significant. Furthermore, subjects who said that distance was more important selected the closer apartment but rated the cheaper apartment as more attractive slightly more often than the opposite reversal (10% vs. 9%).

Subjects in each group had importance judgments that varied from near indifference (i.e., weights of 51 and 49) to complete disregard of an attribute (i.e., weights of 100 and 0). We thought that if preference reversals depended on the importance of the attributes, subjects with more extreme judged weights should show even greater preference reversals. Therefore, we also examined subjects with judged weights that differed by 50 points (i.e., 75 and 25) or more.

In these subgroups, the change in the direction of preference reversals was even more extreme, as expected. Subjects who

**Fig. 5.** Interactions between task effects and judged importance. Preference patterns are shown for subjects who said that rent was more important than distance (a) and for those who said that distance was more important than rent (b).

<table>
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<tr>
<th>A. RENT more Important</th>
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<td><strong>CHOICES</strong></td>
<td><strong>CHOICES</strong></td>
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<tr>
<td>Closer</td>
<td>Cheaper</td>
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<tr>
<td>Ratings</td>
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</tr>
<tr>
<td>Cheaper</td>
<td>27%</td>
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<tr>
<td>Closer</td>
<td>8%</td>
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2. To test the difference between proportions, we used McNemar's test of correlated proportions.
judged rent as more important than distance chose the cheaper apartment over the closer apartment but rated the closer apartment as more attractive more often than the opposite reversal (20% vs. 4%), and those who judged distance as more important chose the closer apartment over the cheaper apartment but rated the cheaper apartment as more attractive more often than the opposite reversal (10% vs. 4%). Thus, preference measurement depends not only on the task and the global context, but also on the perceived importance of the attributes.

In summary, with attribute ranges held constant, the direction of preference reversals across tasks is predictable from the judged importance of the attributes. Subjects choose the apartment that is superior on the attribute judged more important, and rate the other apartment as more attractive. Results suggest that the prominence hypothesis, developed to explain reversals that the prominence hypothesis, developed to explain reversals, also on the perceived importance of the attributes.

These shifts in preferences are truly astounding, especially when seen from the economic view of subjective value or utility. Consider the most expensive apartment ($400) that is closest to campus (only 10 min away). The preference rank for this apartment was as low as 7 in a choice task when the range of rent was narrow, and as high as 20 in a rating task when the range of distance was narrow. That is, the preference rank of the same option in a set of 25 options varied from the 28th percentile to the 80th percentile, depending on the task and the global range of attributes.

In risky decision making, task effects can influence the decision strategy used to evaluate alternatives. In the present studies with riskless decisions, we believe that task effects influence the psychological importance (i.e., weight) that people attach to the attributes they evaluate. This argument is strengthened by the fact that with attribute ranges held constant, preference reversals vary with judgments of importance.

In addition, contextual effects due to changes in attribute range influence the perceptions of the attribute levels (i.e., the subjective values). We have tested this assertion with multi-attribute ratings (Mellers & Cooke, 1994), but it is difficult to distinguish weight and scale hypotheses with direct choices. Because of the similarity of the results in ratings and choices, a common mechanism for range effects seems likely. Furthermore, scale values have also been shown to vary with other contextual effects, such as changes in attribute spacing (Cooke & Mellers, 1995; Mellers & Birnbaum, 1982).

Reversals of preference due to variations in the task and the context lead one to wonder whether preferences can ever be measured accurately. At first glance, one might conclude that this goal seems impossible. However, preferences in the present experiments may, indeed, have been measured accurately. If so, they simply have very little generality without theories of task effects and contextual effects. An important goal for decision researchers is to develop such theories. The present research clearly demonstrates that knowledge of the task, the global context, and the importance of the attributes is needed to understand how, when, and why preferences change in an ever-changing world.

SUMMARY AND DISCUSSION

Results from the present experiments demonstrate systematic effects of the task and the global context on preference measurement. These effects do not reverse preferences for all pairs of apartments; subjects tend to agree on the worst few apartments and the best few apartments in all four conditions. Even apartments having intermediate levels of both attributes receive similar intermediate ranks in all four conditions. But when subjects are confronted with apartments having a favorable level on one attribute and an unfavorable level on the other attribute, preferences often reverse. In other words, apartments with more pronounced trade-offs between rent and distance show the largest effects of both task and context.

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Spacing and frequency of stimulus values. *Journal of Experimental Psychology*, 89, 427-452.


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