A SILVER LINING OF STANDING IN LINE: QUEUING INCREASES VALUE OF PRODUCTS

MINJUNG KOO

AYELET FISHBACH*

In press: Journal of Marketing Research

*Minjung Koo is Assistant Professor of Marketing, SKK Graduate School of Business, Sungkyunkwan University (mkoo@chicagobooth.edu). Ayelet Fishbach is Professor of Behavioral Science and Marketing, Booth School of Business, University of Chicago (ayelet.fishbach@chicagobooth.edu).

ABSTRACT

This article examines a silver lining of standing in line: Consumers infer that products are more valuable when others are behind them. Specifically, we find that the value of a product increases as more people line up behind a person (study 1) or when others are present (vs. absent) behind a person in line (study 2). Value increases further by directing consumers' attention to the presence of others behind them—that is, when they look backward versus forward (study 3) and when the queue structure emphasizes the last person to join versus the person being served (study 4). This effect of the people behind is associated with increased expenditure by queuing consumers (study 5).

Keywords: queue, standing in line, wait, value

Waiting in lines is a ubiquitous social phenomenon people face every day, such as when checking in for flights, purchasing groceries, getting on rides in amusement parks, or waiting on the phone for customer service. Waiting in lines has both economic costs (Becker 1965; Gross and Harris 1985; Newell 1982) and psychological costs, such as people's negative experiences (Bateson and Hui 1992; Carmon, Shanthikumar, and Carmon 1995; Larson 1987; Osuna 1985). Thus, much of the current research on queuing focuses on understanding and reducing its negative consequences on people's retrospective evaluations of the quality of service they received (Baker and Cameron 1996; Houston, Bettencourt, and Wenger 1999; Hui and Tse 1996; Katz, Larson, and Larson 1991; Taylor 1994; Tom and Lucey 1997). However, although queues signal the effort required to reach products, they can also provide information about the value of these products. Accordingly, this article examines how people infer the value of an object on the basis of their queuing experience, for example, how queuing affects the expected enjoyment of an amusement park ride or the amount of money consumers spend at a store. We propose that looking behind and perceiving the real or illusionary progress one made signals an increase in the product's value. As a result, the consumer will not only expect to like but will actually like the product more and increase his or her expenditure.

THEORETICAL BACKGROUND

To address the effect of queuing on the value of the queue object, we employ a goal-based analysis in which standing in line is considered a means to a goal. We predict that for people standing in line, a distinct difference exists between the information they derive from the presence of people behind and ahead of them. Specifically, we predict that the presence of people behind a person conveys information about the value of goal attainment. In contrast, the

presence of people ahead of a person provides information about the required effort to goal attainment. These two inferences from the queuing experience correspond to two distinct questions people ask themselves when working toward a goal: (1) is the goal valuable to me? and (2) am I making sufficient progress toward reducing the discrepancy between the current state and goal attainment? (Koo and Fishbach 2008).

Our main focus is on inferring the value of products. To make an inference on goal value, people rely on their experiences of goal pursuit and the strength of engagement (Higgins 2006; Shah and Kruglanski 2002). In the course of pursuing a goal (e.g., saving for a house), accomplished actions signal to a person that a goal is desirable and commitment is high (Fishbach and Dhar 2005). Because people infer greater value from accomplished actions, they are more likely to adhere to a goal following initial investment, that is, at the point when they consider what they have achieved to date.

Attitude research makes a similar point by suggesting people learn about their preferences by observing their own prior behavior, which leads to a general tendency to select actions that resemble prior ones by serving the same underlying goals (Bem 1972; Cialdini, Trost, and Newsom 1995; Freedman and Fraser 1966). For example, research on effort justification and dissonance reduction posits a general tendency to justify prior investment by pursuing similar actions in the present (Aronson 1997; Aronson and Mills 1959; Cooper and Fazio 1984; Festinger 1957). Furthermore, research on the sunk-cost effect has found that people justify their prior efforts by persisting with the same course of actions that pursue the same goal, even in situations in which they were not successful in the past (Arkes and Ayton 1999; Arkes and Blumer 1985; Thaler 1991).

In the queuing context, the focus on accomplished actions corresponds to looking backward and attending the presence of others behind a person. We predict that when people in a queue look behind (vs. ahead of) them, they assume they have invested in making the progress to date. Hence, they infer the product they are waiting for is more valuable for them than prior to investing in it. For example, amusement park visitors will infer a ride is more enjoyable than they previously believed it was when they see more people behind them in line.

As for the size of the discrepancy to goal attainment (i.e., required effort), people make this inference on the basis of unaccomplished actions required to meet a goal (Carver and Scheier 1998; Higgins 1987; Locke and Latham 2002). Specifically, people in a queue are prone to seek information about the required effort to attain a goal, which they infer from the presence of the people ahead of them. When more people are ahead of them, they infer more effort is required. For example, more people ahead of an amusement park visitor would signal to the visitor that continued effort is required to get to the ride.

Importantly, we predict an asymmetry in inferences whereby the people behind a person signal value, but are less likely to signal required effort, and the people ahead of a person signal required effort, but are less likely to signal value. The focus on the people behind versus ahead of a person is independent of the person's actual position in the queue. That is, at any level of progress (e.g., at the midpoint), a person can focus on either the presence of people behind or ahead of her, and only the focus on the people behind increases evaluation. It follows that even in situations where a person can infer the presence of people behind her from the absence of people ahead of her (i.e., when the total length of the queue is constant) looking ahead would not have the same impact on evaluation as looking back, because what is salient for the person

looking ahead is a lack of progress, which signals the effort still needed to reach the end of the line, rather than progress accomplished, which signals value.

An alternative analysis may suggest that people use the total queue length as social proof that the product is worth waiting for (Cialdini 1985), since valuable products are popular and draw longer lines. If a queue only serves as a social validation cue, its total length should influence valuation regardless of the presence of others behind versus ahead of someone because it indicates popularity. In contrast with this view, our analysis predicts the existence of a unique effect on value for the presence of people behind (vs. ahead of) a person that is independent of the effect of the total number of people waiting in line (ahead and behind). We specifically predict that the sense of accomplishment people get from looking at those behind them causes this effect on value.

Our hypothesis is congruent with previous research on the positive side effects of queuing (e.g., Carmon and Kahneman 1995) and in particular, with research by Zhou and Soman (2003), who show that the presence of people behind a person in a queue decreases the likelihood that the person will leave the queue. However, this previous research does not assess the evaluation of products. The decision to renege can reflect lower valuation, but also other variables, such as lower estimated time cost to reach a product or service if one leaves the line now and decides to come back later. Presumably, if more people line up behind a person, the overall cost of getting the product would be higher if the person joins the queue later. A reneging decision is therefore only partially associated with evaluation of products. To test for value, we explore how the presence of people behind a person in a queue influences value estimates of the queuing goal as well as the person's expenditure at the end of the queue.

Assuming the presence of people behind a person increases the value of a queuing object, a related question arises: When is this inference accurate, revealing actual personal value and when is it not? Naturally, the presence of people ahead is an objective proxy for required effort; however, the presence of people behind does not always reveal actual value, particularly when an individual cannot infer time investment from such presence. Specifically, the presence of people behind a person indicates the value of the queuing goal when such presence reflects actual time investment. Because people tend to invest more in goals that are dear to them, the number of people behind them could be a reliable heuristic for inferring value if that number is correlated with actual investment. However, this generally useful heuristic will lead people in a queue to also infer value from the people behind them when those behind do not correspond to actual time investment and therefore those behind are not indicative of personal value. For example, people standing in line may infer greater value simply by attending to the presence of others behind them as a result of the structure of the queue. In a similar way, illusionary progress (Kivetz, Urminsky, and Zheng 2006; Nunes and Dreze 2006)—that is, when new people join the queue—should have a similar effect on increased perceived value. People may infer they have made some progress from the presence of new people behind them, even when they have not actually progressed. In this case, the focus on the presence of people behind increases perceived value of the queuing goal even when it is not correlated with actual time investment.

We assume people ask about value only to the extent that this information is somewhat unavailable, that is, whenever the value of the queuing goal is ambiguous or not fully known. If people have a clear idea of the value of a product before joining the queue, they should not derive value information from the presence of others behind them. For example, we predict that when people join a line to a novel amusement park ride or a new bakery, the presence of people

behind them will inform them that the ride is enjoyable or the bakery products are tasty to a greater extent than if these products were familiar.

In terms of the downstream consequences of inferring value, we predict that value inferences increase goal adherence, for example, by inducing consumers to increase their expenditures on products or services at the end of the queue. As such, the presence of others behind a person in a line to order food could influence the person's expected liking of the food, which in turn could influence the amount the person spends on the order or how much of it the person consumes.

OVERVIEW OF RESEARCH

We propose people infer value based on accomplished actions, which correspond to the presence and number of people behind them in a queue. Therefore, emphasizing the presence of people behind someone in a queue should increase the value of the queuing goal. We predict that both the actual presence of people behind (but not people ahead of) someone in a queue and the attentional focus on the people behind (vs. ahead of) someone in a queue will increase this person's evaluation of the queue object. As a result, those in line will infer higher value of products (1) as the number of people behind them increases and (2) when they focus on the people behind them versus ahead of them. We further predict that the presence of others ahead of someone in a queue will lead this person to infer the required effort to reach the product but not the value of the product.

Five studies tested our hypotheses. In studies 1 and 2, we examined the effect of the actual number of people behind (vs. ahead of) a person on the evaluation of products. Study 1 assessed the number of people behind and ahead of a person in a queue in a natural field setting

(a bagel-sandwich store), and study 2 manipulated the presence of people behind and ahead of a person in a fully controlled experimental setting. In studies 3 and 4, we manipulated participants' attention to the presence of people behind versus ahead of them to examine whether a focus on the people behind them increased value more than a focus on the people ahead of them. Specifically, study 3 directed participants' attention to the presence of people behind or ahead in a natural field setting (an amusement park ride), and study 4 manipulated the structure of a queue in an experimental setting in which participants were directed to note the last person that joined the queue (behind them) or the person currently being served (ahead of them). Finally, study 5 was a field study that examined the implications of value estimates by testing the effect of the number of people behind (vs. ahead of) a person in a queue on the person's expenditure.

STUDY 1: THE NUMBER OF PEOPLE BEHIND

This field study examined whether those in a queue infer the value of a product from the number of people behind them. We asked customers standing at different positions in a queue of a local bagel shop to estimate their expected enjoyment from their meal and the required effort to reach it. We independently recorded the number of people standing behind and ahead of them. We predicted that the number of people behind a person would increase perceived value of the product, whereas the number of people ahead of a person would increase perceived effort to reach the product.

Method

This study employed a within-subject design with one factor: the number of people behind versus ahead of a person in a queue. Thirty participants (16 females, 14 males) were

recruited at a queue at a bagel shop on a large Midwestern university campus where students and faculty members purchase various customized bagel sandwiches for immediate consumption.

To minimize the effect of time of day, we conducted the entire study during a busy lunchtime. During that time, the total queue size varied from 4 to 14 customers. An experimenter sampled individual participants standing in the queue, asking them to complete a short survey while waiting in line. Meanwhile, another experimenter unobtrusively recorded the number of people standing behind and ahead of each surveyed participant.

To increase the variance in the number of people behind and ahead of the participants, we recruited participants in different positions in the queue. An experimenter who was blind to our hypothesis approached people at the one-third and two-third positions of the queue. For example, when the total queue size was 9 people, the experimenter sampled the people standing at the 3rd and 6th position. After sampling two participants, the experimenter waited until new customers replaced the entire queue. No participants in this study left the queue before completing a purchase.

To measure participants' evaluation of their meal, they rated the extent to which they expected to enjoy the sandwich they were about to purchase (7-point scale: 1 = not at all; 7 = very much). To measure the required effort toward getting their meal, participants indicated how long they expected to wait to get their sandwich (7-point scale: 1 = only a little; 7 = very long). We counterbalanced the order of these two items.

Results and Discussion

We tested the effect of the number of people behind (M = 3.38, SD = 2.22) and ahead of the participant (M = 4.62, SD = 2.49) on the value and effort ratings. Notably, because the total

queue size changed over time, the number of people behind and ahead of the participants were not significantly correlated (r = -.30, p > .10), allowing us to evaluate the effect of these two factors independently. We further controlled for these effects statistically by entering two predictors—the number of people behind and ahead of participants—to the regression analyses.

In support of the hypothesis, a regression of the value measure on the two predictors yielded a positive effect for the number of people behind (β = .40, t(27) = 2.16, p < .05) but not for the number of people ahead (β = .12, t < 1; see figure 1)[1]. In addition, a similar regression of the effort measure yielded a positive effect for the number of people ahead (β = .59, t(27) = 3.55, p < .01) but not for the number of people behind (β = .26, t(27) =1.57, p > .13). Thus, when we control for the number of people ahead of participants in the queue, more people behind them increased the perceived enjoyment of the product. When we control for the number of people behind the participants in the queue, more people ahead of them increased the perceived effort to reach the product.

Insert figure 1 about here

The zero-order correlations yielded a similar pattern. The number of people behind the participants predicted value (r = .37, p < .05) but not effort (r = .08, *ns*). In contrast, the number of people ahead of the participants predicted effort (r = .51, p < .01) but not value (r = .00, *ns*). In addition, we found that the total length of the queue (ahead and behind) did not predict value (r = .29, p > .10) but predicted effort (r = .52, p < .01), which suggests participants clearly inferred

[1] We report standardized coefficients here and in subsequent analyses.

different information from the number of people behind (value) and ahead of (effort) them in the queue[2].

These results provide initial field-based evidence that people infer value from the presence of others behind them in a queue, which signals personal investment. In addition, they do not infer value from the presence of others ahead of them, which leads them to infer effort, or from the total length of the queue. Because participants did not infer value from the total length of the queue, we can rule out an alternative interpretation: the presence of others, regardless of their position, provides social proof that the queuing goal is valuable. Although the length of the line may have signaled the value of the product before an individual joined the queue (i.e., people infer that popular sandwiches draw long lines), a unique effect for the presence of people behind those already standing in line existed that was independent of the presence of others in general.

Because study 1 was a field study, some limitations were associated with the lack of experimental control. In addition, this study could not distinguish between the effect of illusionary progress (i.e., when new people join the queue) and actual progress (i.e., time investment). To address these limitations, study 2 was a fully controlled experimental design that manipulated both the presence of people behind and the presence of people ahead of the participants while holding actual time investment constant. Using an experimental design, we investigated whether people inferred greater value of products if others joined the queue after them, even if these people did not make actual progress.

[2] A similar analysis conducted on participants' sampling position (one-third and two-third) revealed the position did not predict value (r = -.16, p > .30) or effort (r = .19, p > .30), implying that the inferences of both value and effort were not based on participants' relative position in the queue but rather on the absolute number of people behind and ahead of them.

STUDY 2: THE PRESENCE OF PEOPLE BEHIND

Study 2 examined whether the presence (vs. absence) of people behind someone in a queue increases one's perceived value of the queuing goal in a fully controlled experimental design. We recruited participants for a taste-test study in which they sampled an unfamiliar smoothie. To manipulate the presence of people behind and ahead of participants in a queue, two confederates either joined the queue behind the participant or did not, and another two confederates either were standing in a queue ahead of the participant or were not. We predicted that when others joined the queue after the participant, the participant would expect to enjoy the smoothie more and would prefer it over monetary compensation compared with when no one joined the queue. Furthermore, there should be no similar effect on expected enjoyment for the presence of people ahead of the participant in a queue.

Method

This study employed a 2 (people behind: two vs. none) × 2 (people ahead: two vs. none) between-subjects design. Sixty-three participants (37 females, 26 males) were recruited for a taste-test study at a large Midwestern university campus. A table was set up in the hall of a student facility for a "smoothie sample tasting study." Experimenters solicited participants (not voluntarily approach) passing nearby and randomly assigned them to the four conditions. The participants completed the study one at a time.

We presented the study as a blind taste test. Participants' task was to sample an unfamiliar smoothie presented as a "new brand of smoothie with a flavor of mixed berries." The smoothie sample was served in a small cup.

To manipulate the presence of people behind, half of the participants completed the study after two confederates lined up behind them and the other half completed the study with no people behind them. To manipulate the presence of people ahead of the participant in the queue, half of the participants completed the study in the absence of people ahead of them and the other half completed the study in the presence of two confederates ahead of them. The confederates, all males, were undergraduate students at the same university as the participants.

About 30 seconds after participants joined the queue and before they tasted the smoothie, an experimenter handed a survey to all the people in the queue (the participant and the confederates), which and they all completed at that time. The time between joining the queue and receiving the survey was equal across conditions. No one joined or left the queue during this time. The experimental survey measured the expected value of the smoothie sample. Participants reported the extent to which they expected to enjoy the sample smoothie before they tasted it (7-point scale: 1 = not at all; 7 = very much). After tasting the sample, participants also reported their actual enjoyment of the sample on the same scale, and they indicated their preference for compensation between a cup of the smoothie and $.50 (7-point scale: 1 = definitely $.50; 7 = definitely smoothie). Upon completion of the study, an experimenter debriefed and dismissed the participants, none of whom expressed awareness of the experimental manipulation.

Results and Discussion

We analyzed the expected enjoyment ratings of the smoothie. In support of the hypothesis, a people behind × people ahead ANOVA yielded the predicted main effect for people behind the participant in the queue ($F(1, 59) = 6.14$, $p < .05$; see figure 2). Neither a main effect of people ahead nor an interaction was significant (Fs < 1). That is, regardless of the

presence of people ahead, when the confederates lined up behind the participants, the participants expected to enjoy the smoothie sample more (M = 5.46, SD = 1.07) than in the absence of confederates behind them (M = 4.39, SD = 1.66).

Insert figure 2 about here

We also analyzed participants' actual enjoyment ratings after tasting the smoothie. An ANOVA of post-tasting enjoyment yielded the predicted main effect for people behind the participant in the queue ($F(1, 59) = 3.93$, $p < .05$), and neither a main effect of people ahead nor an interaction was significant (Fs < 1). This main effect indicates that participants enjoyed the sample more when others lined up behind them (M = 5.20, SD = 1.59) than they did in the absence of others behind them (M = 4.42, SD = 1.73), and there was no effect for the people ahead of them on their actual enjoyment. Apparently, adding people behind the participant increased the actual enjoyment from the sampled smoothie.

We conducted a similar analysis on the ratings of participants' preference for compensation. In support of the hypothesis, a people behind × people ahead ANOVA yielded the predicted main effect for people behind the participant in the queue ($F(1, 59) = 11.02$, $p < .01$). Neither a main effect for people ahead nor an interaction was significant (Fs < 1). Regardless of the presence of people ahead of participants in the queue, participants preferred a cup of smoothie over monetary compensation in the presence of people behind them (M = 3.88, SD = 2.39) more than in the absence of people behind them (M = 2.14, SD = 1.76).

Study 2 finds that the presence (vs. absence) of people who line up behind a person increases the perceived value of a product and there is no similar effect for the presence of

people ahead of a person. Because the presence of people behind and ahead was experimentally manipulated, it did not correspond to the actual time spent in the queue and could not reveal actual preference. We conclude that people infer value from illusionary progress toward the queuing object even when it does not correspond to actual progress (i.e., time investment).

In addition, because the presence of people ahead of a participant had no influence on the evaluation of the smoothie, we can again rule out an alternative possibility that the presence of people behind the participant in the queue increased value by providing social proof that the product is valuable. This alternative would predict that the presence of people in a queue signals value, regardless of their position (ahead or behind), but we find that for people standing in line, only the presence of people behind increases value.

It could still be argued that both people behind and ahead of someone in a queue provide information about value, but at the same time, the presence of people ahead of someone in a queue also provides negative information about required effort, which cancels out the positive information on value. However, this alternative is less likely since required effort would reduce only the value of the wait experience, whereas we find effects on the value of the product itself (i.e. the smoothie). By measuring the value of the products, rather than the queuing experience, we are thus able to tease apart inferences of value versus effort.

Thus far, the studies have investigated the effect of the number or presence of people behind a person in a queue on his evaluation of a product. Next, we investigate whether the attentional focus on the people behind someone is sufficient to improve evaluation. We predict that by directing people's attention to the presence of others behind (vs. ahead of) them in a line, we can increase evaluation, since looking behind makes accomplishments more salient. This effect should be independent of the actual presence of people lining up behind the person.

STUDY 3: LOOKING BACKWARD AT OTHERS IN A LINE

Study 3 was a field study conducted in an amusement park. It tested whether park visitors standing in line infer a ride is more valuable when their attentional focus is on those behind (vs. ahead of) them. To manipulate attentional focus, amusement park visitors were asked to look backward (vs. forward) to estimate the number of people behind (vs. ahead of) them in the queue to a ride. Then they indicated their expected enjoyment of the ride.

In addition, study 3 tested whether value ambiguity moderates the effect on value. Unlike previous studies that used ambiguous experiences, it manipulated value ambiguity. We predicted that people use information about the people behind them to infer value only in the absence of more direct information. In the amusement park context, the presence of people behind one in line should increase value only when value is somewhat unknown. If value is already known to be high, those in line will not infer value of ride from the presence of others behind them. Thus, we predicted that looking backward (vs. forward) would increase perceived value, but only if the value of the ride was somewhat ambiguous, that is, if the ride was not familiar or popular.

Method

This study used a 2 (ride type: familiar vs. unfamiliar) × 2 (focus: backward vs. forward) between-subjects design. Seventy-nine participants (53 females, 26 males) were recruited in queues in an amusement park in South Korea. Two of them did not complete the value measures and were dropped from the study. Participants were standing in queues for either a familiar, popular ride, for which value ambiguity was low (“Pharaoh’s Fury”; $M_{\text{estimated length}}$ = 102.24 people, SD = 34.38, M_{time} = 45 min), or a less familiar, unpopular ride, for which value

ambiguity was high ("Spinning Basket"; $M_{\text{estimated length}}$ = 59.08 people, SD = 19.30, M_{time} = 25 min). Pharaoh's Fury is one of the signature rides in the amusement park and appeared in commercials; thus, its value was not ambiguous to park visitors before completing a ride. However, Spinning Basket was a rather unfamiliar ride that most visitors encountered for the first time when they visited the park; thus, in general, its value was ambiguous before completing a ride.

To reduce the variance between the number of people behind and ahead of the participants in the lines, the experimenter approached only those who were standing in the middle of the lines. After sampling each participant, the experimenter waited until the line moved and the sampling position was filled with new visitors before approaching the next person. Half of the participants were randomly selected to look backward and estimate how many were standing behind them, and the other half were asked to look forward and estimate how many people were standing ahead of them. Then, to assess the perceived value of the ride, participants in both conditions rated the extent to which they (1) wanted to go on the ride and (2) expected to enjoy the ride (7-point scale: 1 = not at all; 7 = very much). Finally, participants indicated on 7-point scales (1) how often they visited the amusement park and (2) how popular each ride was.

Results and Discussion

A ride type × focus ANOVA on popularity ratings yielded a main effect only for the ride type ($F(1, 73) = 18.62$, $p < .01$; all other Fs < 1), indicating that the predicted familiar ride was indeed more popular (M = 4.60, SD = 1.41) than the predicted unfamiliar ride (M = 3.33, SD = 1.29). Thus, we may reasonably assume participants had better information on the value of the familiar ride. Another ride type × focus ANOVA on the frequency of visiting the amusement

park did not yield any effect or interaction (Fs < 1). Although we did not have a random allocation to the ride-type variable, these results indicate that participants in the queue for the familiar versus unfamiliar ride had similar prior exposure to the amusement park. In addition, participants' estimates of the number of people behind and ahead of them were similar within each ride (familiar: $M_{backward}$ = 50.49, $M_{forward}$ = 51.75, t < 1; unfamiliar: $M_{backward}$ = 29.00, $M_{forward}$ = 30.17, t < 1). Because we sampled participants in the middle of the queues, the finding that those in both backward and forward conditions provided similar estimations suggests the focus manipulation did not systematically affect accuracy of estimation.

To test our hypothesis, we collapsed the value measures (r = .70, p < .001). A ride type × focus ANOVA of the value index yielded a main effect for ride type (F(1, 73) = 8.46, p < .01), indicating more positive evaluations of the familiar ride (M = 5.00, SD = 1.35) than the unfamiliar ride (M = 4.20, SD = 1.22). There was no main effect for focus (F < 1). More important, this analysis yielded the predicted ride type × focus interaction (F(1, 73) = 6.65, p < .05; see figure 3).

Insert figure 3 about here

Contrasts analysis showed that for the unfamiliar ride, participants who directed their attention backward evaluated the ride more positively (M = 4.64, SD = 1.31) than those who directed their attention forward (M = 3.69, SD = .90; t(37) = 2.61, p < .05). However, for the familiar ride, the evaluations of the ride were similar for those who directed their attention forward (M = 5.25, SD = 1.28) and for those who directed their attention backward (M = 4.73, SD = 1.41; t(36) = –1.18, p > .20). In addition, looking backward in the queue for the unfamiliar

ride increased positive evaluations (M = 4.64), such that they were not significantly different from the evaluations of the familiar ride, regardless of focus condition ($M_{backward}$ = 4.73; $t < 1$; $M_{forward}$ = 5.25; $t(36) = 1.57$, $p > .10$). It appears that we were able to increase the expected value of an unfamiliar ride up to the level of a familiar one simply by directing visitors to the presence of people behind them.

These results extend our findings in two ways. First, we find that focusing people's attention on the side of the queue that represents accomplished actions increases perceived value independent of the actual number of people (both behind and ahead of them) and time spent in line, which were kept similar across the attentional focus conditions. Second, ambiguity of value moderates the effect of looking backward versus forward on evaluation. These findings have implications for marketers who want to increase the value of somewhat ambiguous products (e.g., a new ride). They can increase the value of a product by directing consumers' attention to the people behind as opposed to ahead of them, even when the actual number of people in line is constant. For example, marketers can design a line system that makes the presence of people behind them more salient (e.g., using a mirror), thereby increasing product valuation.

We designed another study to test more directly for the underlying mechanism of value inferences. We predict that the presence of people behind someone in a queue signals personal accomplishment, which in turn increases this person's evaluation of a product. The perception of making progress in the line should thus mediate the effect of directing attention backward (vs. forward) on value. In addition, study 4 extends the previous findings by employing a different manipulation of attentional focus on the presence of people behind (vs. ahead). To this end, we studied a "take-a-number" system that retailers, government, health providers, and airlines, among others, all successfully use. Using this queuing system, service providers distribute

numbers to people in a queue to manage the order of service. We explore two structures of this queuing system. In one structure, the number being served is indicated (e.g., with a “Now Serving Number X” sign), which makes the presence of people ahead of a person salient. In the other structure, the number that will be taken by the next person who joins the queue is indicated (e.g., with a “Please Take-a-Number” sign), which makes the presence of people behind a person salient. We predict that a focus on the number to be taken by the next person (behind) will increase people’s perceived value of their queuing goal more than a focus on the number being served (ahead).

STUDY 4: THE TAKE-A-NUMBER QUEUING SYSTEM

This study used another taste test, which we used to examine whether a focus on the presence of people behind (vs. ahead of) someone increases perceived progress, which in turn increases the attractiveness of a food sample. We distributed numbered tickets to participants who were waiting to sample an unfamiliar cookie. In our take-a-number systems, participants saw either the number to be taken by the next person to join the line or the number being served.

Specifically, in the “focus on the people behind” system, participants saw what number was available for the next person to join the line. In the “focus on the people ahead” system, participants saw what number was being served at the moment. As our dependent variables, participants indicated their perceived progress in the line and expected enjoyment of the sample cookie. We predicted that a queue structure that emphasized the presence of people behind (vs. ahead) would increase the perception of progress in the queue and, consequently, the expected enjoyment of the sample cookie.

Method

This study employed a 2 (queuing system: behind vs. ahead) between-subjects design. Forty-seven participants (27 females, 20 males) were invited to participate in a taste test in return for monetary compensation. We advertised the study among undergraduate students who participated on a walk-in basis at a Midwestern university.

We conducted the study in an experimental lab that consists of two rooms: one for waiting and the other for the actual taste test. First, participants were guided to a waiting room to pick a numbered ticket (from 15 to 30) that marked their position in the line to the taste test. In the room, a confederate played the role of a participant waiting to be called. Once that confederate was called for the taste test, he left the room and the experimenter invited another person, also a confederate, to enter the waiting room and get a number while the participant was waiting in the room. Using this method, all participants had one person ahead of them and another person behind them. Confederates were all undergraduate male students.

We swapped the queue system four times during the experiment to ensure participants were randomly assigned to the two focus conditions. In the “focus on the people behind” queue system, the number that was available for the next person who joins the line was posted on a 10" × 10" white board set up in the center of the waiting room. When a participant entered the waiting room, the participant picked up a number from the white board, which immediately revealed the number for the next person to join the line. The confederate that came in after the participants did the same. The participants handed the number to the experimenter when called to the taste test. This queue system allowed the participants to view the two numbers right after them on the board.

In the “focus on the people ahead” queue system, the number being served at the moment was posted on the board. Experimenters gave each participant a numbered ticket when he or she joined the line, and the participant posted it on the board when called for the taste test. This queue system allowed participants to view the two numbers right before them.

While participants were waiting for the taste test, they completed a survey, which included the main dependent variables. Each participant completed this survey about 5 minutes after arriving at the waiting room, at the time when the participant was next in line to be served. In this survey, participants first provided some demographic information and reported how often they ate snacks (we obtained similar ratings across conditions; $t < 1$). They then read that they were going to taste a new type of chocolate-covered cookie with orange filling. Next, to measure perceived progress in the queue, participants indicated how far along they felt they were in the line by the time they completed the survey (i.e., “I complete this survey…” 7-point scale: 1 = immediately after joining the line; 7 = after making some progress in the line). Recall that everybody received the survey about 5 minutes after they joined the line. Thus, their answers reflected perceived progress in the queue. Finally, participants indicated the extent to which they expected to enjoy the sample cookie (7-point scale: 1 = not at all; 7 = very much).

The participants completed the actual taste test in a different room. After eating the cookie, they reported their actual enjoyment of it on the same scale and were debriefed and dismissed.

Results and Discussion

An analysis of perceived progress supported our hypothesis: participants in the focus-behind queuing system indicated making more progress in line ($M = 4.28$, $SD = 1.37$) than those in the focus-ahead queuing system ($M = 3.14$, $SD = 1.55$; $t(45) = 2.68$, $p < .01$).

Another analysis of expected enjoyment supported our hypothesis on value: participants in the focus-behind queuing system indicated that they expected to enjoy the sample cookie (M = 4.72, SD = 1.24) more than those in the focus-ahead queuing system (M = 3.86, SD = 1.58; $t(45) = 2.08$, $p < .05$). The absolute number participants received (between 15 and 30) did not affect value estimates ($r = .00$, *ns*).

The perception of accomplished progress mediated the effect on expected evaluation (see figure 4). Specifically, the focus on the people behind (vs. ahead) directly increased participants' expected enjoyment of the sample cookie ($\beta = .30$, $t(45) = 2.08$, $p < .05$). In addition, the focus on the people behind (vs. ahead) increased perceived progress ($\beta = .37$, $t(45) = 2.68$, $p < .01$), which in turn increased expected enjoyment ($\beta = .43$, $t(45) = 3.19$, $p < .01$). When we controlled for perceived progress, the path between the focus manipulation and the expected enjoyment became nonsignificant ($\beta = .16$, $t(44) = 1.09$, $p > .20$), whereas the path between focus and perceived progress remained significant ($\beta = .37$, $t(44) = 2.56$, $p < .05$). The Sobel test statistic indicated that the reduction of the focus effect on expected enjoyment was marginally significant ($z = 1.87$, $p = .06$).

Insert figure 4 about here

Participants' actual enjoyment from the sample cookie after they tasted it did not vary across focus conditions ($t < 1$). Recall that in study 2, participants' expectations were further reflected in their post-tasting evaluations, such that those who had others lining up behind them actually liked the sampled smoothie more. In contrast, in this study, the taste experience washed out the effect of the focus manipulation, which we speculate reflects that the sampled cookie was

more unique than the rather neutral smoothie drink; thus, participants were less ambiguous about their evaluations. We assume that when participants have a clear and strong opinion about the taste of a sample, they are less likely to infer taste from their queuing experience.

These results extend our previous findings. We find that participants' focus on the presence of people behind (vs. ahead of) them increased their perceived progress in the line, which in turn increased the expected enjoyment from the cookie. These results further offer clear implications for marketers who wish to design a queuing system that increases the value of products. It appears that in a take-a-number system, emphasizing the number that is available for the next person who joins the line is more effective than emphasizing the number that is now being served.

Our studies thus far assessed the value of a product that participants were waiting for, and such effects on valuation should have downstream consequences for consumption. Accordingly, in our last study, we tested for the implications of more positive evaluation on increased consumption.

STUDY 5: IMPLICATIONS FOR EXPENDITURE

An implication of increased evaluation is that consumers will increase their expenditure on products, for example, by consuming more items, purchasing an upgrade, or choosing an improved model. Accordingly, study 5 tested whether an increase in the number of people who joined a line at a university cafeteria increased patrons' money expenditure when they reached the end of the line.

Method

This study employed a within-subject design with one factor: the number of people behind versus ahead of a patron. An experimenter unobtrusively recorded the behavior of eighty customers (37 females, 43 males) who joined a line at a university cafeteria of a large Midwestern university campus during a busy lunchtime.

The study was conducted at a university cafeteria where students and faculty members get their lunches, snacks, and coffee drinks for immediate consumption. The cafeteria is organized such that most of the items for purchase are off-the-shelf items (e.g., soda, salad, packaged sandwiches), which are available along the line to the cashier and constitute self-service items. There are also customized coffee drinks and several bakery items that can be ordered toward the end of the line, just before one reaches the cashier stand. Because customers decide on most of their purchases while progressing in line, we were able to assess the simultaneous influence of the people behind and ahead of the participants on their purchase decisions.

Specifically, an experimenter tracked each participant from the time the participant entered the line until he or she reached the end of the line and made a purchase. No participants in this study left the queue. During this time, queue lengths varied from 3 to 15 people and the total wait time was up to five minutes. While waiting, participants picked their food and ordered coffee drinks before reaching the end of the queue.

To test our prediction, three pieces of information were noted for each participant: (1) the number of people ahead of the participant when he or she joined the line (the total length at the joining moment), (2) the number of people behind the participant when he or she made a

purchase at the end of the line (the total length when participants reached the cashier), and (3) the amount of money the participant spent.

Results and Discussion

We tested the effect of the number of people behind participants upon reaching the cashier (M = 5.73, SD = 3.56) and ahead of participants when they just joined the line (M = 6.43, SD = 2.52) on money expenditure. Notably, these two independent variables were positively correlated (r = .38, $p < .001$) as a result of changes in consumer density (how crowded the line was) over time. We statistically controlled for the effect of the number of people ahead of the participants by including it as another factor in the regression analysis.

In support of the hypothesis, a regression of the amount of money spent on two predictors—the number of people behind and ahead of a person—yielded a positive effect for the number of people behind (β = .33, $t(77) = 2.83$, $p < .01$) but not for the number of people ahead (β = –.05, $|t| < 1$; see figure 5). Thus, when we controlled for the number of people ahead of the participant when he or she joined the queue, a larger number of people behind the participant upon reaching the end of the line resulted in a greater amount of money spent. The zero-order correlations yielded a similar pattern; expenditure was predicted by the number of people behind (r = .31, $p < .01$) but not by the number of people ahead (r = .07, $p > .50$) of the participants.

Insert figure 5 about here

The number of people ahead of a participant when the participant joined the line did not affect expenditure; thus, it is unlikely participants spent more money because they had more time

to select products. This null effect further rules out an alternative explanation that the presence of others increased perception of scarce resources (i.e., products might run out soon) or induced participants to combine two consecutive purchases in one visit to save time because both the people behind and the people ahead of a person could convey this information. It can still be argued that only the number of people behind a person was salient at the purchase point, when participants reached the cashier. However, because participants chose most of their products while standing in line, the numbers of people behind and ahead of them were similarly salient at the selection time. Therefore, we conclude that the presence of people behind the participants increased perception of accomplishment, which is associated with value and caused the increase in expenditure.

GENERAL DISCUSSION

Waiting in line has both economic and psychological costs (Bateson and Hui 1992; Becker 1965). Thus, the majority of prior research on queuing has focused on the negative consequences of queues (Katz et al. 1991; Larson 1987), in particular, how queuing reduces evaluations of the service quality (Houston et al. 1999; Taylor 1994). In contrast to previous research, we view queuing as a goal-directed behavior and examine a positive downside of queuing, that is, how standing in lines provides information about the value of the queuing goal (i.e., products). We propose that when people are part of a queue, the presence of others behind them is a proxy for accomplished actions. Because people infer value from accomplished actions (Bem 1972; Koo and Fishbach, 2008; Higgins 2006), the presence of others behind them signals that the queuing goal is more valuable. In contrast, the presence of others ahead is a proxy for

unaccomplished actions and therefore does not increase the perceived value of the queuing goal. Rather, the presence of others ahead in a queue signals required effort.

Our results across five studies support this analysis. Study 1 demonstrated that as the absolute number of people behind a person increased, the perceived value of a bagel sandwich increased. Meanwhile, the number of people ahead of a person did not affect the perceived value, but rather increased perceived effort to reach the purchase point. Study 2 further showed that an experimental manipulation of the presence (vs. absence) of people behind a person in a queue increased the expected value of a food sample, but there was no effect for the presence (vs. absence) of people ahead of a person.

Studies 3 and 4 showed that the attentional focus on the presence of people behind (vs. ahead of) a person in a queue increased perceived value, regardless of the actual number of people in the queue. Specifically, study 3 revealed that drawing attention to the presence of people behind (vs. ahead of) a person in a line for an amusement park ride increased the perceived value of the ride. This study further showed that the effect on value depends on whether the value of the queuing goal is somewhat ambiguous. When the value of the ride was ambiguous, attentional focus on the people behind the participant increased perceived value more than attentional focus on the people ahead of the participant. Study 4 tested for the underlying mechanism of inferring value from the people behind. It found that a queue structure that emphasizes the people behind (vs. ahead of) a person leads to greater perceived progress in the queue, which translates into more favorable expectations of enjoying a product, in this case, a food sample. Finally, study 5 investigated the downstream behavioral consequences of making inferences on the perceived value, showing that a larger number of people behind someone in a queue resulted in greater money expenditure at a store.

Taken together, these studies demonstrate the silver lining of standing in line: consumers standing in a queue derive information on value from the people behind them. The presence of people behind someone has a unique effect on value, which is not driven by the effect of the total number of people in line. We further find no effect for the presence of people ahead of a person on value. Notably, the total length of the line may still influence evaluation prior to joining the line by suggesting that the product is popular (Cialdini 1985). However, our results indicate that once people join the line, they seem to infer value only from the presence of people behind them. Then, because consumers tend to form their evaluations mainly based on their experience at the end point of the queue, at the point where their progress is at its maximum and their evaluation is at its peak (Ariely and Carmon 2000; Carmon and Kahneman, 1995), it is likely that queuing experiences have a net positive impact on retrospective evaluations of products.

In general, the motivation to adhere to a goal can be a function of estimates of value or, alternatively, the size of the discrepancy between the current state and goal attainment (Carver and Scheier 1998; Higgins 1987). Accomplished actions drive goal pursuit because they increase one's positive evaluation of the goal, which increases one's sense of commitment to goal pursuit. Conversely, unaccomplished actions drive goal pursuit because they create a sense of lack of sufficient progress, which increases the desire to reduce the discrepancy between the current position and goal attainment. In the queue context, the presence of people behind a person signals value and the presence of people ahead of a person signals effort. It follows that "backward-looking" people may pursue the queuing goal because they infer greater value and "forward-looking" people may pursue the goal because they infer that the required effort is not too high. Therefore, backward-looking people may end up enjoying their queuing experience more than forward-looking people.

In several important ways, our findings extend previous research on the effect of the number of people behind someone in a queue on the decision to renege (Zhou and Soman 2003). First, we investigate the effect of people behind someone in a queue on perceived value, which is distinct from the decision to renege. Motivation to act (e.g., renege) is often viewed in terms of a joint function of several variables, including perceived value, estimated cost, and expectancy of attainment (Feather 1982; Lewin et al. 1944; Tolman 1955; Vroom 1964). Distinguishing between these separate effects by observing reneging decisions is difficult, which is the reason we measured people's evaluations and purchase decisions. In addition, whereas reneging decisions were explained in terms of downward social comparisons, such comparison between one's position and others' positions only applies to inference of effort (i.e., "I need to invest less time and effort than others behind me"). It does not apply to inference of value, because consumers need not subscribe to a lay theory relating evaluation to the position in the line (i.e., "I value the product more than others behind me"). Instead, downward social comparisons can be one source of increased perceived accomplishment, which in turn increases value. Specifically, consumers may infer higher value from the presence of people behind because they feel that they have accomplished more than before others joined the line. In this way, social comparison influences evaluation by creating a sense of personal accomplishment (Kivetz and Simonson 2003). As an example of this process, Fishbach and Dhar (2005) employed a social comparison standard (downward vs. upward) to manipulate participants' perceived goal accomplishment and consequently increase their commitment to a goal.

Our findings further extend previous research on illusionary progress. This research demonstrated that people work harder on a goal if they believe progress has been made toward it (Kivetz et al. 2006; Nunes and Dreze 2006). For example, Kivetz et al. (2006) find that

consumers who received a 12-stamp coffee card with 2 preexisting bonus stamps—illusionary progress—showed greater motivation to collect stamps than those who received a regular 10-stamp card. However, given that motivation is a function of several variables (e.g., value, expectancy, estimated cost), it was unclear in previous studies whether illusionary progress increases value. Alternatively, participants' greater motivation in previous studies could result from their heightened goal expectancy or their estimation of less effort to achieve the goal. Indeed, Forster, Higgins, and Idson (1998) provide an account of the "goal-looms-larger" effect, which does not assume changes in evaluation. According to these researchers, the increase in motivation as a person approaches a goal end state reflects the person's perception that less effort is needed to complete the goal; thus, the increase in motivation is due to a lower cost estimate. In contrast, the current research demonstrates, in the context of queues, that illusionary progress increases value estimates, which increases the motivation to adhere to a goal independently of the effect of effort estimates.

MANAGERIAL IMPLICATIONS

This research has important implications for managing and designing a queue structure to maximize consumers' evaluation of products (see also Rothkopf and Rech 1987). We find that the greater the number of people behind a consumer, the greater the product valuation, especially when the consumer is not familiar with the product. It follows, for example, that for a newly opened bakery, a single line (with more people behind the consumer) would increase the perceived value of the bakery more than multiple lines (with less people behind the consumer). As a related anecdote, a gourmet supermarket chain has recently employed a new queuing system in which customers form a long single line that feeds into a passel of cash registers rather

than the generally favored one-line-per-register system (Barbaro 2007). As we would predict, this queuing system seems to increase sales and customer satisfaction, presumably because customers had more people lining up behind them on average, although a potential cost is that it may deter new customers to join the line (Carmon and Kahneman 1995; Gibson 1998)

More intriguing, we find that emphasis on the presence of people behind a person in a queue signals greater accomplishment and leads to higher perceived value of a queuing goal, regardless of the actual number of people in the queue. Specifically, in study 3, we demonstrated that directing attention toward the presence of people behind versus ahead of a person in a queue increased the perceived value of an amusement park ride. Using the take-a-number system, study 4 showed that emphasizing the number to be taken by the last person to join the queue increased participants' evaluation of a food sample. These findings imply that a queue structure that highlights the presence of people behind a person increases the perceived value of the queuing goal without changing the total number of people in a queue. This in turn, can increase consumer expenditure, as in study 5.

These findings have several practical implications. For example, using a mirror, store designers can shape queues so customers can get a good view of the presence of those behind them. In addition, service providers that have consumers wait on the telephone line can find it more effective to emphasize information on the number of callers behind (vs. ahead of) the caller. We would predict that people are more likely to value the service if their attention is drawn to others that called after them rather than those who called before them.

In practice, marketers often try to minimize consumers' attention to the size of the queue (Lovelock and Wirtz 2004). In many amusement parks, for example, queue designers try to make the length of a queue less salient to people—for example, shaping it jaggedly—to distract or

disguise people's perception of it. Queue researchers have also attempted to discover strategies for reducing the negative effects of the perception of time by creating distractions, such as a news board or television (Katz et al 1991). However, the current research suggests that these efforts could diminish the positive role of the presence of people behind a person—namely, as a value signal of a queue object. That is, as Katz et al. (1991) show, distraction may increase happiness about queuing experience in general by decreasing perception of time, but we propose it could also decrease perceived value of the queue object (i.e., products). A queue structure that emphasizes actual or illusionary accomplished actions (the presence of people behind a person in a queue) will be effective in increasing the perceived value of a queue object, especially when people are not familiar with it.

As a final note, we believe these findings have general implications for research on self-regulation and for understanding how people infer the value of their goals. We expect that a sense of accomplishment and the resultant increase in value are not limited to effortful acts of self-regulation, such as standing in lines. Rather, a similar process of inferring value from prior engagement appears in the pursuit of hedonic and intrinsic goals, including, for example, playing an instrument, going on a vacation, or, hopefully, reading this article.

REFERENCES

Aiken, Leona S. and Stephen G. West (1991), *Multiple Regression: Testing and Interpreting Interactions*, Thousand Oaks, CA: Sage Publications.

Ariely, Dan, and Ziv Carmon (2000), "Gestalt Characteristics of Experiences: The Defining Features of Summarized Events," *Journal of Behavioral Decision Making*, 13, 191–201.

Arkes, Hal R. and Peter Ayton (1999), "The Sunk Cost and Concorde Effects: Are Humans Less Rational than Lower Animals?" *Psychological Bulletin*, 125 (5), 591–600.

Arkes, Hal R. and Catherine Blumer (1985), "The Psychology of Sunk Cost," *Organizational Behavior and Human Decision Processes*, 35 (1), 124–40.

Aronson, Elliot (1997), "The Theory of Cognitive Dissonance: The Evolution and Vicissitudes of an Idea," in *The Message of Social Psychology: Perspectives on Mind in Society*, ed. Craig McGarty and S. Alexander Haslam, Malden, MA: Blackwell Publishing, 20–35.

Aronson, Elliot and Judson Mills (1959), "The Effect of Severity of Initiation on Liking for a Group," *Journal of Abnormal and Social Psychology, 66* (6), 584–588.

Baker, Julie and Michaelle Cameron (1996), "The Effects of the Service Environment on Affect and Consumer Perception of Waiting Time: An Integrative Review and Research Propositions," *Journal of the Academy of Marketing Science, 24* (4), 338–349.

Barbaro, Michael (2007, June 23), "A Long Line for a Shorter Wait at the Supermarket," *The New York Times,* Retrieved from http://www.nytimes.com/2007/06/23/business.

Bateson, John E. G. and Michael K. Hui (1992), "The Ecological Validity of Photographic Slides and Videotape," *Journal of Consumer Research*, 19 (September), 271–81.

Becker, Gary S. (1965), "A Theory of the Allocation of Time," *Economic Journal*, 75 (September), 493–517.

Bem, Daryl J. (1972), "Self-Perception Theory," in *Advances in Experimental Social Psychology*, Vol. 6, ed. L. Berkowitz, New York: Academic Press, 1–62.

Carver, Charles S. and Michael F. Scheier (1998), *On the Self-Regulation of Behavior*, New York: Cambridge University Press.

Carmon, Ziv and Daniel Kahneman (1995), "The Experienced Utility of Queuing: Real-Time Affect and Retrospective Evaluations of Simulated Queues," unpublished manuscript, INSEAD, France.

Carmon, Ziv, J. George Shanthikumar, and Tali Carmon (1995), "A Psychological Perspective on Service Segmentation: The Significance of Accounting for Consumers' Perceptions of Waiting and Service," *Management Science,* 41 (November), 1806–1815.

Cialdini, Robert B. (1985), "Persuasion Principles," *The Public Relations Journal*, 41 (October), 12–16.

Cialdini, Robert B., Melanie R. Trost, and Jason T. Newsom (1995), "Preference for Consistency: The Development of a Valid Measure and the Discovery of Surprising Behavioral Implications," *Journal of Personality and Social Psychology*, 69 (2), 318–28.

Cooper, Joel and Russell H. Fazio (1984), "A New Look at Dissonance Theory," in *Advances in Experimental Social Psychology*, Vol. 17, ed. L. Berkowitz, New York: Academic Press, 229–66.

Feather, Norman T. (1982), "Actions in Relation to Expected Consequences: An Overview of a Research Paradigm," in *Expectations and Actions: Expectancy-Value Models in Psychology*, ed. N. T. Feather, Hillsdale, NJ: Erlbaum, 53–95.

Festinger, Leon A. (1957), *A Theory of Cognitive Dissonance*, Stanford, CA: Stanford University Press.

Fishbach, Ayelet and Ravi Dhar (2005), "Goals as Excuses or Guides: The Liberating Effect of Perceived Goal Progress on Choice," *Journal of Consumer Research*, 32 (December), 370–77.

Forster, Jens, E. Tory Higgins, and Lorraine C. Idson (1998), "Approach and Avoidance Strength During Goal Attainment: Regulatory Focus and the "Goal Looms Larger" Effect," *Journal of Personality and Social Psychology*, 75 (5), 1115–31.

Freedman, Jonathan L. and Scott C. Fraser (1966), "Compliance Without Pressure: The Foot-in-the Door Technique," *Journal of Personality and Social Psychology*, 4 (2), 195–202.

Gibson, Richard (1998, Sep 3), "Merchant Mull the Long and Short of Lines," *The Wall Street Journal.*

Gross, Donald and Carl Harris (1985), *Fundamentals of Queuing Theory*, New York: Wiley.

Higgins, E. Tory (1987), "Self-Discrepancy: A Theory Relating Self and Affect," *Psychological Review*, 94 (3), 319–40.

——— (2006), "Value from Hedonic Experience and Engagement," *Psychological Review*, 113 (3), 439–60.

Houston, Mark B., Lance A. Bettencourt, and Sutha Wenger (1999), "The Relationship between Waiting in a Service Queue and Evaluations of Service Quality: A Field Theory Perspective," *Psychology and Marketing, 15* (8), 735–753.

Hui, Michael K. and David K. Tse (1996), "What to Tell Consumers in Waits of Different Lengths: An Integrative Model of Service Evaluation," *Journal of Marketing*, 60 (April), 81–90.

Katz, Karen, Blaire Larson, and Richard Larson (1991), "Prescriptions for the Waiting-in-Line Blues: Entertain, Enlighten, and Engage," *Sloan Management Review,* 32 (Winter), 44–53.

Kivetz, Ran and Itamar Simonson (2003), "The Idiosyncratic Fit Heuristic: Effort Advantage as a Determinant of Consumer Response to Loyalty Programs," *Journal of Marketing Research*, 40 (November), 454–67.

Kivetz, Ran, Oleg Urminsky, and Yuhuang Zheng (2006), "The Goal-Gradient Hypothesis Resurrected: Purchase Acceleration, Illusionary Goal Progress, and Customer Retention," *Journal of Marketing Research*, 43 (1), 39–58.

Koo, Minjung and Ayelet Fishbach (2008), "Dynamics of Self-Regulation: How (Un)accomplished Goal Actions Affect Motivation," *Journal of Personality and Social Psychology*, 94 (2), 183–95.

Larson, Richard (1987), "Perspectives on Queues: Social Justice and the Psychology of Queuing," *Operations Research*, 35 (November/December), 895–905.

Lewin, Kurt, Tamara Dembo, Leon A. Festinger, and Pauline S. Sears (1944), "Level of Aspiration," in *Personality and the Behavioral Disorders*, ed. J.M. Hunt, New York: Roland Press, 333–71.

Locke, Edwin A. and Gary P. Latham (2002), "Building a Practically Useful Theory of Goal Setting and Task Motivation: A 35-Year Odyssey," *American Psychologist*, 57 (9), 705–717.

Lovelock, Christopher H. and Jochen Wirtz (2004), *Services Marketing: People, Technology, and Strategy*, NJ: Prentice Hall

Newell, Gordon (1982), *Applications of Queuing Theory*, New York: Chapman & Hall.

Nunes, Joseph C. and Xavier Dreze (2006), "The Endowed Progress Effect: How Artificial Advancement Increases Effort," *Journal of Consumer Research*, 32 (March), 504–512.

Osuna, Edgar (1985), "The Psychological Cost of Waiting," *Journal of Mathematical Psychology*, 29 (March), 82–105.

Rothkopf, Michael H. and Paul Rech (1987), "Perspectives on Queuing Systems: Combining Queues is Not Always Beneficial," *Operations Research, 35* (September), 906–909.

Shah, James Y. and Arie W. Kruglanski (2002), "Priming Against Your Will: How Accessible Alternatives Affect Goal Pursuit," *Journal of Experimental Social Psychology*, 38 (4), 368–83.

Taylor, Shirley (1994), "Waiting for Service: The Relationship Between Delays and Evaluations of Service," *Journal of Marketing*, 58 (April), 56–69.

Thaler, Richard H. (1991), *Quasi Rational Economics*, New York: Russell Sage Foundation.

Tolman, Edward C. (1955), "Principles of Performance," *Psychological Review*, 62, 315–26.

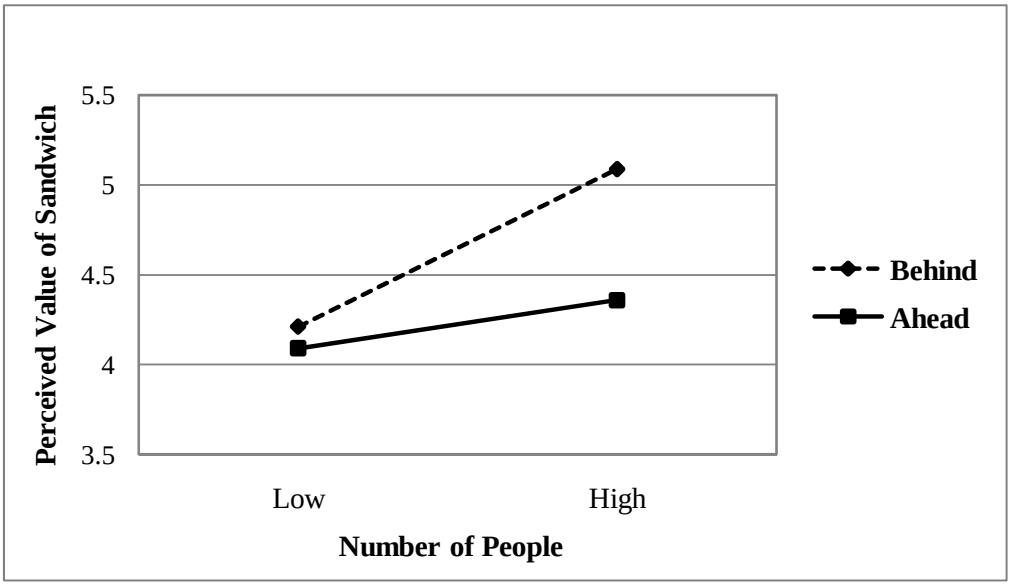
Tom, Gail and Scott Lucey (1997), "A Field Study Investigating the Effects of Waiting Time on Customer Satisfaction," *Journal of Psychology*, 131 (November), 655–60.

Vroom, Victor H. (1964), *Work and Motivation*, New York: Wiley.

Zhou, Rongrong and Dilip Soman (2003), "Looking Back: Exploring the Psychology of Queuing and the Effect of the Number of People Behind," *Journal of Consumer Research*, 29 (March), 517–30.

FIGURE 1

PERCEIVED VALUE OF THE MEAL SANDWICH AS A FUNCTION OF THE NUMBER OF PEOPLE BEHIND AND AHEAD (STUDY 1)



Note: Following Aiken and West (1991), we present value predicted by the regression model to obtain at ± one standard deviation from the means.

FIGURE 2

PERCEIVED VALUE OF THE BEVERAGE SAMPLE AS A FUNCTION OF THE PEOPLE BEHIND AND AHEAD (STUDY 2)

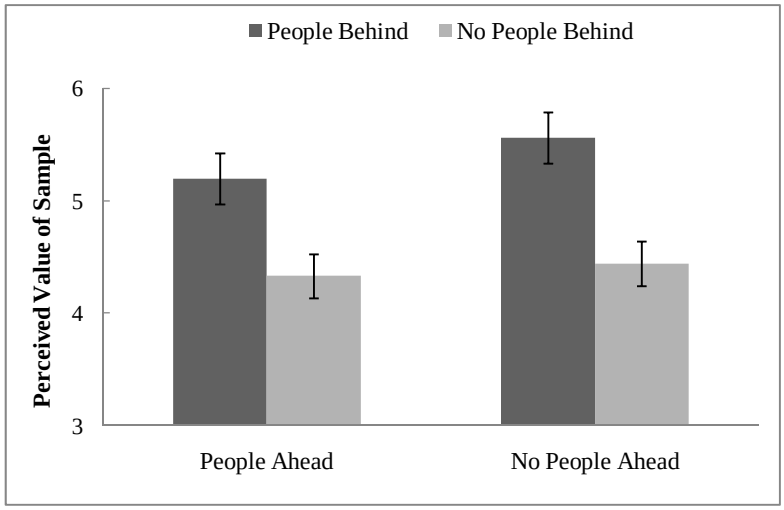


FIGURE 3

PERCEIVED VALUE OF FAMILIAR VERSUS UNFAMILIAR RIDES AS A FUNCTION OF LOOKING BACKWARD VERSUS FORWARD (STUDY 3)

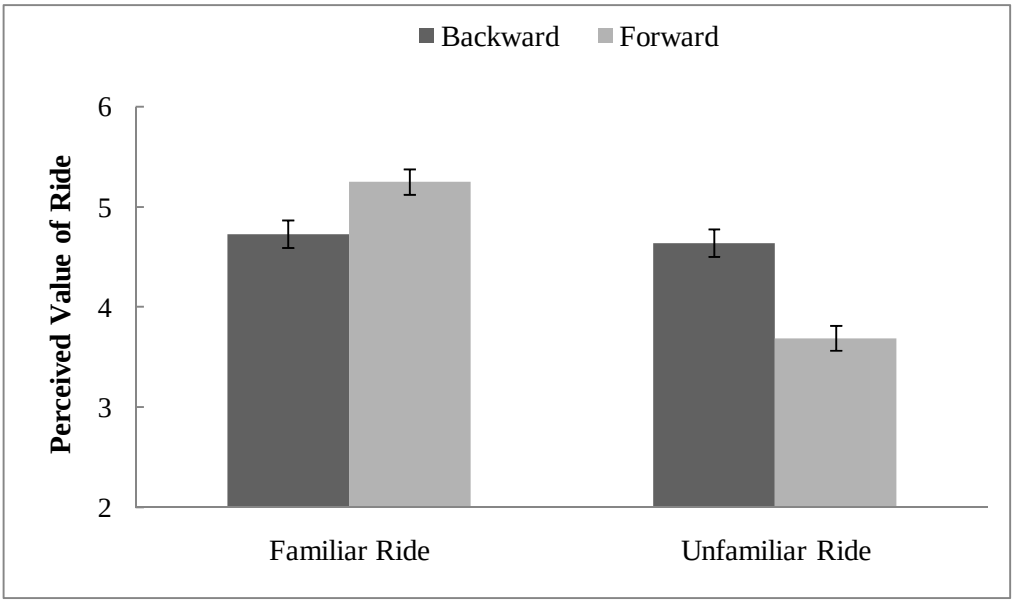
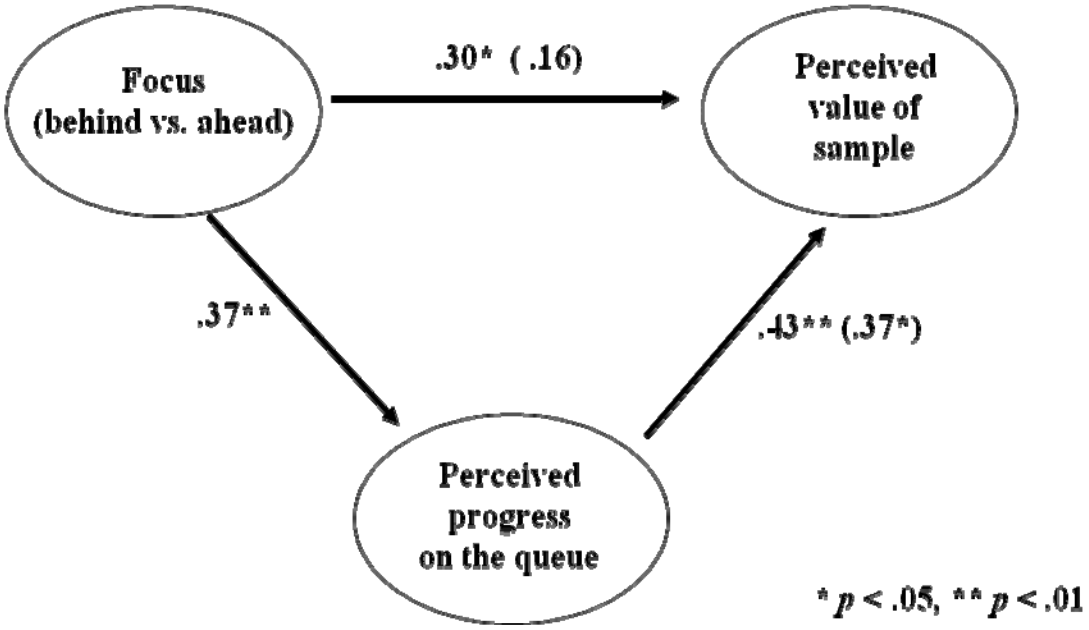


FIGURE 4

PATH MODEL OF THE EFFECT OF THE FOCUS ON PEOPLE BEHIND VERSUS AHEAD ON PERCEIVED PROGRESS AND PERCEIVED VALUE OF THE FOOD SAMPLE (STUDY 4)

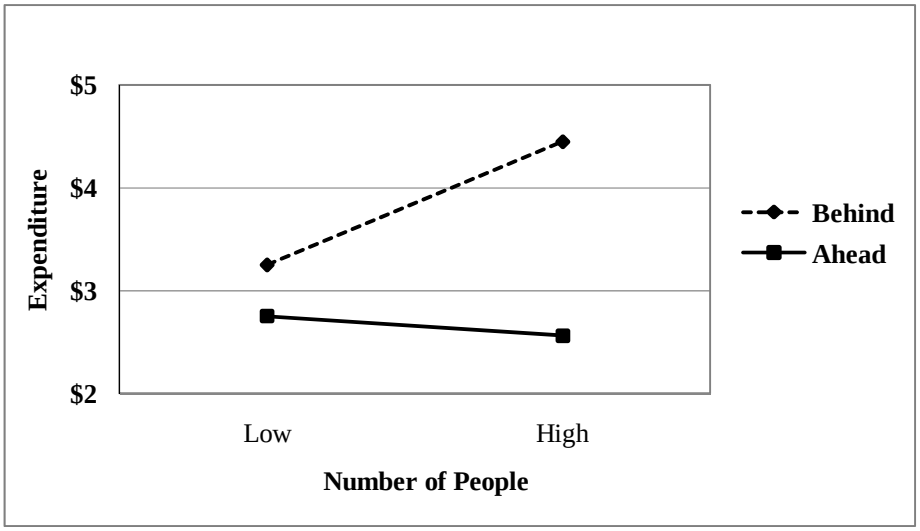


Note: Numbers not in parentheses are standardized betas. Numbers in parentheses are zero-order standardized betas.

FIGURE 5

EXPENDITURE AS A FUNCTION OF THE NUMBER OF PEOPLE BEHIND AND AHEAD

(STUDY 5)



Note: Following Aiken and West (1991), we present value predicted by the regression model to obtain at ± one standard deviation from the means.