Crossing the Virtual Boundary: The Effect of Incidental Cues on Task Accomplishment

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ABSTRACT

Many task-oriented activities are preceded by a phase in which people approach the activities, either physically or temporally. In this paper, we suggest that the psychological effects of this progression are often marked by a discontinuity. In particular, we show that incidental cues in the task context can serve as a virtual boundary of the task system and define the perceived start of the task experience. Once this boundary is crossed, people adopt an in-system mindset that leads to greater commitment to the task. This mindset also results in an overall increase in optimism and action orientation towards the current activity and even other unrelated judgment scenarios. Further, we demonstrate that this effect is attenuated if people' initial commitment towards the activity is already high due to another incidental cue.

Key words: mindset, incidental cues, commitment, optimism, action orientation

While individuals' lifespans are marked by memorable experiences, they are also filled with a potentially larger set of experiences that are task-oriented and are performed not with great relish, but with a view to getting them done. A reflection on what the authors did on the day this paper was written is illustrative: paid bills, organized tax papers, sent in a package using a courier company, went to the doctor for a check-up, got a passport photograph taken, and waited in line to purchase a fast-food meal. Most of these task-oriented activities involve a visit to a service provider. Also, there is often a gap—either temporal or both spatial and temporal—between the point where the individual starts to engage in the activity and the actual activity itself. A consumer at a bank or a post office may have to wait in a queue for an agent to help her with a transaction. A passport applicant has to pass through several stages of processing, both physically and over time, before her passport application is approved and accepted. A restaurant patron who orders an exotic dish may need to wait before the chef cooks and serves the dish. And a patient referred to a specialist doctor may have to wait for a few weeks before getting an appointment to visit the doctor's clinic. These gaps may have multiple effects on individuals. In particular, some people may decide to renege and postpone or avoid the task. Others may go through the experience and report dissatisfaction with it if the delay is long.

Our investigations show that in situations like these, an individual's approach towards the final activity might not be continuous, but rather is marked with a discontinuity. We note, in particular, that the physical and informational context surrounding such tasks creates discontinuities by serving as a virtual boundary which defines the starting point of the task system. Once an individual passes this virtual boundary, we suggest that they are inside the system and adopt an in-system mindset. Prior to that, they are outside the system. The virtual boundary could be created by the physical context of the waiting environment (e.g., in a long queue within a fast-food restaurant that extends beyond the designated waiting area, people who are physically in the designated waiting area are "inside" while the rest are "outside"), or by an informational intervention (e.g., passport applicants who have their applications checked for completeness may feel that they are "inside" while those waiting for the first stage of processing are "outside").

More generally, we propose that people's progress towards the task can be divided into two stages by the presence of incidental physical or informational cues. The virtual boundary could also be created by using appropriate semantic cues. In our experiment, for example, we could get participants to behave differently by simply using the terms "wait inside" or "wait outside" to refer to the same waiting area.

In our research, we study situations in which we create a virtual boundary and ask the following questions:

1) What is the effect of a virtual boundary on individuals' behavior? In a series of five experiments involving both hypothetical and real task-oriented activities, we find that participants who have crossed the virtual boundary are more committed to the task than those who have not crossed the boundary. This commitment is manifested as a greater willingness to wait and a lower willingness to pay to switch to faster service.
2) Why does crossing the virtual boundary increase commitment? In previous work on goal attainment, researchers (cf. Gollwitzer 1999) outline various stages that individuals go through when working towards their goal. In particular, they argue that mindsets can change from deliberative to implemental as one identifies specific goals to pursue. Our work builds on and extends this idea; we propose that apart from the conscious setting of goals, the presence of incidental cues can change one's mindset and evoke an in-system

perception. Consistent with our theorizing, we find that individuals who are inside the system are more optimistic and action-oriented than those who are still outside.

3) Are the effects of the virtual boundary on commitment, optimism, and action orientation robust? In several experiments, we cross our virtual-boundary manipulation with a second method of increasing in-system perception. When people are initially outside the task system, crossing the virtual boundary has a stronger effect. However, when people have already adopted an in-system mindset, the effect of additional incidental cues is weaker.

The rest of this paper is divided into three broad sections. First, we review relevant literature and develop our theoretical framework. Second, we describe the results of five laboratory experiments designed to test our framework. Finally, we conclude with a general discussion, offer directions for future research, and discuss managerial implications.

CONCEPTUAL FRAMEWORK

People often physically and temporally approach situations where they need to get things done, and hence one might expect that the context of the approach might be a significant driver of their behavior. One stream of research has studied the effects of waiting and queuing on consumer behavior. Waiting for task attainment is a fairly common consumer experience (Hockenhull 2000; Larson 1987), and it is important to understand the effects of waiting on the overall experience. For example, researchers have found that certain interventions in the waiting environment can improve the palatability of the wait. In particular, Katz, Larson, and Larson

(1991) showed that overall satisfaction decreases as perceived and actual waiting times increase. However, entertaining and enlightening waiting consumers through a display board reduces perceived wait. Likewise, Oakes (2003) showed that playing slow-tempo (vs. fast-tempo) music in the background lowers perceived waiting time.

Other researchers have explored the role of social comparisons in queuing situations (cf. Koo and Fishbach 2010a; Zhou and Soman 2003). Zhou and Soman (2003) demonstrated a seemingly irrational role of the number of people behind oneself in the queue on one's decision to continue waiting, and argued that these effects arise due to people making social comparisons with the relatively unlucky people behind them. A larger number of people behind have also been shown to increase the desirability of the consumption goal (Koo and Fishbach 2010a). Further, perceived progress towards the head of a queue—or towards the end goal in general—can influence people's decision of whether to continue waiting in line or not (Soman and Shi 2003). Relatedly, temporal distance to the goal state of the service encounter has been shown to impact people's affective responses to the wait and service evaluation (Hui, Thakor, and Gill 1998), or people's focus on the remaining tasks versus completed tasks in the progression of various goals in life leads to different levels of motivation and satisfaction (Koo and Fishbach 2010b).

The implicit assumption in much of the prior research which studies people approaching a goal is one of continuity; in particular, every movement towards the goal continuously increases progress. In fact, Soman and Shi (2003) explicitly modeled progress as a continuous function of distance from the goal. In our research, we adopt a different perspective. Specifically, we posit that an individual's approach can be marked by a discontinuity which might determine *when* the task is seen to commence. We explore the notion that incidental cues in the waiting environment can trigger the existence of a virtual boundary that separates the perceptions of being "inside" versus "outside" a task system, even if the distance to the goal is constant. Once people traverse these virtual boundaries, they adopt an in-system mindset, leading to changes in their subsequent judgment and behavior.

Channel Factors

Perhaps the first social scientist to dwell on the "power of the situation" in influencing behavior was Kurt Lewin (Lewin 1951, 1952; see also Ross and Nisbett 1991) who proposed the field theory and the concept of channel forces. In his conceptualization, channel forces refer to small situational forces that either increase impelling forces or reduce constraining forces to move individuals towards a specific behavior. He also used the term "gate" to refer to an intervention that facilitates the desired behavior. While Lewin did not explicitly say so, a reading of his work (Lewin 1951, 1952) suggests that the channel forces terminology he used is one that implies people's conscious awareness of the channel force.

Researchers have subsequently used the term "channel factors" to refer to contextual interventions employed to influence behavior. For instance, Leventhal, Singer, and Jones (1965) showed that participants who had also been given a campus map with the location of the health center circled were more likely to receive a tetanus shot than those who had simply attended a lecture about the importance of receiving tetanus inoculation. More recently, Mullainathan and Shafir (2009, p. 138-139) provided evidence from a program designed to entice an unbanked, low-income population to open bank accounts. In one version of the program, members of the target population attended a workshop where they received a referral letter and forms that would allow them to open an account. In a second version, participants received the same materials, but were able to submit the first form to a bank representative present during the workshop. Participants in the second version of the workshop were not only more likely to follow through and complete the application process, but were also more likely to use the bank services more regularly.

While the notion of channel factors is an interesting metaphor for thinking about the effects of the context, it still begs two questions. First, do the effects of channel factors persist in situations where people do not cognitively process the intervention? And second, why do certain factors influence behavior? We draw upon research in the area of mindsets to provide an account of these effects.

Decision Stages and Mindsets

When making decisions, individuals often go through multiple decision stages (Gollwitzer 1999; Lee and Ariely 2006). In research on goal systems, Gollwitzer and his colleagues (Gollwitzer 1999; Gollwitzer and Bayer 1999; Gollwitzer, Heckhausen, and Steller 1990) propose that goal pursuance is characterized by two separate, sequential stages: an initial stage in which individuals are uncertain about their goals and seek to define a desired outcome, and a subsequent stage in which individuals have already established the goal they wish to pursue, and are considering when, where, and how to attain the goal. Gollwitzer and his colleagues posit that people tend to adopt a deliberative mindset in the first stage (one characterized by open-mindedness and a more accurate and impartial analysis of goal-relevant information), and an implemental mindset in the second stage (one characterized by close-mindedness and a more optimistic and partial analysis of goal-relevant information.)

This stream of research has also shown that these different mindsets can be induced in different ways. Mindsets can change from deliberative to implemental as people finalize what goals they want to pursue and advance from one stage of the goal-attainment process to the next. Alternately, instructing people to think about the *how* (vs. the *why*) of attaining a goal can also result in a shift in mindsets (Taylor and Gollwitzer 1995). Further, explicitly asking people to either evaluate the relative attractiveness of or to indicate their relative preference within a set of objects can enhance their implementation orientation (Xu and Wyer 2007, 2008) in an unrelated product category. The specific mindset that people adopt can also change as a function of physical location. For example, shoppers at a grocery store tend to adopt a more implemental mindset when they are inside the store rather than outside the store (Lee and Ariely 2006).

In the present research, we propose that seemingly arbitrary or incidental cues in the environment can also activate an implemental (in our language, an in-system) mindset. The fact that cues in the environment influence judgments and decisions has previously been documented in a wide variety of settings (Ariely, Loewenstein, and Prelec 2003; Berger and Fitzsimons 2008; Chartrand et al. 2008; Childers and Houston 1984). In our work, we explore different types of incidental cues— physical, informational, and pure semantic—in individuals' waiting environment which could serve as a virtual boundary that defines the perceived starting point of the task at hand. Once people cross this boundary, they mentally move from the "outside" to the "inside" of the task system and adopt an implemental in-system mindset.

The Effect of In-system Mindset on Judgment and Behavior

Once the implemental mindset is activated, people become more committed to the current goal they have decided to pursue and tend to have a different cognitive orientation, one that is more focused and close-minded (Gollwitzer 1999; Gollwitzer and Bayer 1999). Gollwizer (1999), for example, found that people in an implemental (vs. deliberative) mindset tend to complete the focal task in a more timely fashion, and that their increased commitment is associated with a higher resistance to peripheral distractions that can thwart goal attainment. In line with this latter general tendency, it has been shown that people in an implemental mindset and better able to recall peripherally presented words that they had not been explicitly instructed to keep in mind (Fujita, Gollwitzer, and Oettingen 2007).

Related effects of the implemental mindset have also been documented in recent marketing research. For instance, Lee and Ariely (2006) show that shoppers at a later stage in their shopping process (e.g. shoppers inside a store) have more concrete shopping goals and are less susceptible to the influence of conditional promotions (e.g. "Spend $10 and get $1 off") than shoppers at an earlier stage of their shopping process (e.g. shoppers entering a store). Dhar, Huber, and Khan (2007) found that stimulating an initial purchase can activate the implemental mindset which in turn increases the likelihood of a second purchase. Even the mere act of asking people to consider which of a number of alternative products they would prefer (without making any real purchases) can activate an implemental mindset, resulting in higher purchase likelihood of these focal products and even other products in a subsequent unrelated purchase situation (Xu and Wyer 2007, 2008).

Building on this prior work, we propose that some incidental cues in the waiting environment can help people cross the virtual boundary and trigger off an in-system mindset which increases their commitment to the task. In this sense, incidental cues can act as the "gates" that Lewin (1951) talked about in spurring people towards achieving the task at hand. We formally hypothesize:

H1: Incidental cues in the waiting environment can increase people's commitment to the task at hand.

Further, prior literature has shown that people with an implemental mindset are more optimistic in general, and might, for example, perceive themselves to have greater (illusory) control over their extant environment (Gollwitzer and Kinney 1989), or rate themselves more highly on various personal qualities and attributes (e.g. athletic ability and popularity) compared to their peers (Taylor and Gollwitzer 1995). Additionally, individuals with an implemental mindset also have a general propensity to act. For example, it has been shown that they were faster at re-initiating projects that they had previously put off (Pösl 1994, as cited in Gollwitzer and Bayer 1999) and less likely to defer choice (Xu and Wyer 2008). Thus, we hypothesize that:

H2: The increase in commitment triggered by incidental cues is due to the activation of an in-system mindset which is characterized by a general increase in optimism and action orientation.

To test our hypotheses, we designed and conducted a series of five experiments using a variety of incidental cues in different waiting environments to create a virtual boundary and trigger an in-system mindset. A more nuanced conceptual understanding of the features and relative strength of different types of cues that create the boundary is beyond the scope of the current paper.

In experiment 1, we demonstrated the basic effect of an incidental physical cue (the presence and length of a queue guide next to a queue in a post office) on people's commitment to accomplishing the task. In experiment 2, we investigated the interaction of two different informational cues and showed the attenuation of the effect of one informational cue on people's task commitment when the other cue was already present. While this result provided initial evidence for our virtual-boundary account, in experiments 3 and 4, we attempted to test the underlying mechanisms of the basic effect more directly besides conceptually replicating the effect in a real-waiting context. Specifically, we examined the influence of incidental physical, informational, and semantic cues, and their interactions on people' optimism and action orientation which serve as process measures for the in-system mindset. In Experiment 5, we further investigated whether these general effects of optimism and action orientation associated with the in-system mindset could be activated by a subtle semantic cue and could apply to situations and judgments unrelated to the current task system.

We next report the design and results of these experiments in detail.

EXPERIMENT 1

Experiment 1 was designed to test H1 by manipulating an incidental *physical* cue in the waiting environment within a post office. The physical cue we used was a queue guide: a series of pillars with elastic tapes strung between them that are often used to guide queues at airports and public-utility offices. Based on observation studies and interviews, we expected that people who were in the region of the queue bounded by the guides to be in system and those in the queue that extended beyond the guides to be outside.

Participants, Design, and Procedure

A total of 148 students in a North American university participated in this experiment for monetary compensation. All participants were asked to imagine they were at a post office to send a small package that would cost about $10 in postage. They were also told that usually several service counters were operational, but on this particular day of their visit, all the service counters except one had to be closed due to mechanical problems. Consequently, the queue was moving very slowly. Participants were shown an attached diagram in which their position in the queue was marked (see appendix A). The participant was always the eighth person in the queue, and was told that the estimated waiting time was about 30 minutes.

Within this basic framework, the length of the queue guide was manipulated at one of three levels (Queue Guide: Long Guide, Short Guide, No Guide). In the long-guide condition, the diagram showed a queue guide that covered 11 customers (hence including the participant); in the short-guide condition, the guide was shorter and covered only five customers (hence excluding the participant); finally, in the no-guide condition, there was no queue guide. Participants were randomly assigned to one of the three conditions.

Participants were told that the post office offered an "immediate service" facility where, for a fee, an agent would collect their materials and complete the mailing for them. As the dependant measure, we asked participants to indicate their willingness to pay (WTP) to receive this immediate service.

Results

A one-way ANOVA indicated a significant main effect of queue guide on participants' WTP for immediate service ($F(2, 145) = 3.30$, $p < .05$). Planned comparisons further showed that participants in the long-guide condition were willing to pay significantly less than participants in the short-guide condition ($M_{\text{long-guide}}$= \$3.57, $M_{\text{short-guide}}$ = \$5.26; $t(100) = 2.43$, $p < .05$). These participants were also willing to pay marginally less than participants in the no-guide condition ($M_{\text{no-guide}}$ = \$ 4.59; $t(102) = 1.78$, $p = .07$). There was no significant difference in WTP between participants in the short-guide condition and those in the no-guide condition ($t(88) = .87$, $p = .39$).

Discussion

The results of experiment 1 demonstrated that a mere manipulation of queue-guide length could have a significant effect on people's WTP for immediate service rather than continue waiting in line. Participants who were in the region of the queue spanned by the guide (and had, in our language, crossed the virtual boundary) were more likely to stick it out in line rather than pay for immediate service. The observed result pattern provided initial support for H1, showing that an incidental cue can increase one's commitment to the task at hand and reduce one's propensity to renege.

EXPERIMENT 2

Experiment 1 showed the positive effect of an incidental physical cue (i.e., a long queue guide) on participants' task commitment (i.e., waiting in line in a post office). We posit that this increase in task commitment could be explained by the activation of an in-system mindset due to the presence of the physical cue; this cue served as a virtual boundary that gave participants the perception of being inside the task system. One implication of this virtual-boundary account is that once people perceive themselves to be inside the system (due to an incidental cue, for instance), the effect of an additional cue would have less impact in driving this perception. Thus, in experiment 2, besides attempting to replicate the basic effect using *informational* cues in the waiting environment instead of a physical cue, we examined the interaction effect of two separate cues on task commitment; in doing so, we sought to test a potential boundary condition of the basic effect and provide empirical support for our virtual-boundary account.

Participants, Design and Procedure

A total of 235 people in a large Asian city were recruited outside a travel agency located in a busy shopping center to respond to a questionnaire in exchange for monetary compensation. All participants were asked to imagine that they had decided to go on a short vacation to a foreign country, and were set to depart on the following Monday, six days from the date of data collection (on Tuesday). However, they had just been made aware (on Tuesday) that they would need a tourist visa to enter this country. Participants were told that the visa was a formality and it was rare to get denied. After checking with the consulate, they had found out that there were two ways in which they could apply for the visa: the more convenient *drop-box* option with a turn-around time of two or three days, and the *apply-in-person* option in which they could obtain the visa on the same day but which would require personal waiting in the visa office. The requirements and fees were specified, and were held constant across all conditions. Participants were further told that there were three stages in the in-person application process; a checking of their application form, identity verification on the computer, and stamping of their passport. Each stage would be performed by a different agent at a separate desk and would take about 15 minutes. Customers were given a number when they entered the visa office in the order of their arrival.

Within this basic scenario, we manipulated two incidental cues in a 2 (Waiting Time: Integrated vs. Segregated) x 2 (Immediate Start: Yes vs. No) between-subjects design, and each participant was randomly assigned to one of the four conditions. In the integrated-waiting conditions, participants were told that they would have to wait for approximately 135 minutes in a large seating area before their number was called. However, once their number was called, they would move along from stage to stage. The whole process should therefore take approximately three hours (135 + 15 + 15 + 15 = 180 minutes). In contrast, in the segregated-waiting conditions, the waiting was divided into three parts in which each of the three (15-minute) stages would be preceded by a 45-minute wait. The whole process would therefore also take on average three hours (45 + 15 + 45 + 15 + 45 + 15 = 180 minutes). Participants were also shown a diagram that depicted the respective process (see appendix B). We posited that the commencement of the first stage (i.e., checking of their application form) served as a virtual boundary of the visa application process. Thus, the segregated-waiting conditions would induce an in-system mindset earlier than the integrated-waiting conditions.

These manipulations were fully crossed by a second procedural manipulation. Half of the participants (*immediate-start* conditions) were told that in addition to this process, there was an initial registration (prior to the initial waiting) which would take 15 minutes. To keep the total duration of the visa application constant across conditions, we shortened the total waiting time after initial registration from 135 minutes to 120 minutes [40 minutes per stage for the segregated-waiting conditions].

After reading the given scenario, all participants were asked to choose between the drop-box option and the apply-in-person option. They were reminded that while the drop-box option was more convenient, they would be cutting it close given that they were due to depart soon.

Participants also indicated their relative preference between the two options on a nine-point scale, anchored at 1 (“Definitely drop-box”) and 9 (“Definitely apply-in-person”).

Despite the fact that there was no difference in the total amount of application time (three hours) across the four conditions, we predicted that participants’ commitment towards waiting (and hence their relative preference between the two options) would vary depending on the virtual boundaries set up by the two incidental cues. Specifically, for those who were not in the immediate-start conditions (i.e., who did not have to complete an initial registration step), we expected that they would prefer the in-person option more when they were faced with the segregated-waiting (vs. integrated-waiting) scenario since a shorter initial wait would get them past the virtual boundary sooner, as H1 would predict. However, we believe that participants in the immediate-start conditions would be equally likely to prefer the apply-in-person option regardless of integrated or segregated waiting since they would perceive the process of application to start almost immediately with the initial registration.

Results

The main dependent measure was the relative preference between the two options. (Note that higher scores represent greater preference for the apply-in-person option.) A 2 x 2 ANOVA showed a marginally significant main effect of waiting time ($F(1, 231) = 2.76$, $p = .10$), a significant main effect of immediate start ($F(1, 231) = 11.93$, $p = .001$), and a significant interaction between waiting time and immediate start ($F(1, 231) = 7.86$, $p < .005$). Consistent with our predictions, when there was no initial registration, participants significantly preferred to apply in person when it involved segregated waiting than when it involved integrated waiting ($M_{\text{segregated-waiting}} = 5.98$ vs. $M_{\text{integrated-waiting}} = 4.80$; $F(1, 116) = 8.89$, $p < .005$). However, when a registration step was added to the beginning of the process, the effect of the type of waiting was attenuated as we found no difference in participants' relative preference between the two options ($M_{\text{segregated-waiting}} = 6.16$, $M_{\text{integrated-waiting}} = 6.46$; $F(1, 117) = .74$, $p = .40$; see figure 1). We posit that the initial registration (i.e., immediate start) had already served as a virtual boundary for the task system; hence, the specific type of subsequent waiting was less likely to influence participants' perception of being inside or outside the system.

Insert figure 1 about here.

The choice data between the in-person and drop-box options showed a similar pattern of effects. We found an overall significant difference across conditions ($\chi^2(3) = 14.44$, $p < .005$). Pairwise comparisons were conducted with logistic regression. When there was no immediate start, significantly more participants chose the apply-in-person option in the segregated-waiting condition than in the integrated-waiting condition ($M_{\text{segregated-waiting}} = 65\%$ vs. $M_{\text{integrated-waiting}} = 42\%$; $B(1) = 5.81$, $p < .05$); however, this effect was attenuated when an immediate start was introduced ($M_{\text{segregated-waiting}} = 72\%$ vs. $M_{\text{integrated-waiting}} = 70\%$; $B(1) = .054$, $p = .82$).

Discussion

Experiment 2 replicated the main finding in experiment 1 and provided further support to H1 by showing participants' increased commitment to the task at hand due to the presence of informational cues. Furthermore, the results are consistent with our virtual-boundary account. In particular, we set up one cue (initial registration) such that the virtual boundary was crossed immediately on choosing the apply-in-person option. However, in the absence of that cue (and only in its absence), we found that a second “virtual-boundary” cue had a significant effect on increasing the choice for the option that involved greater effort.

EXPERIMENT 3

Experiments 1 and 2 provided support for H1, indicating that incidental cues—whether physical or informational—can increase task commitment. These experiments were conducted using hypothetical waiting scenarios, and focused only on outcomes (choices) as indications of commitment. The interaction (substitution) effects of two incidental cues on task commitment in experiment 2 is consistent with our proposed virtual-boundary account. In experiments 3 to 5, we sought to test our hypotheses regarding the psychological mechanism (i.e., optimism and action orientation) of the basic effect of incidental cues on task commitment in real-waiting situations. Specifically, in experiment 3, we examined the effect of different physical and informational cues on people’s optimism towards getting a task accomplished.

Participants, Design, and Procedure

A total of 66 students in a North American university participated in this experiment for monetary compensation. Participants signed up for an experimental session that consisted of two unrelated parts. This particular experiment was conducted during the waiting period between these two parts. After participants had finished the first part of the session, the experimenter thanked them for completing the first part and asked them to take a short break before receiving instructions for the second part of the session. After the break, participants were informed that the second part would be held in a different room at the other end of the corridor. Within this basic set-up, we manipulated two incidental cues: a) the location of their wait, and b) the timing of a consent form they had to complete. Regardless of where they waited and when they read the consent form, participants had to wait for the same amount of time for the main task.

Half of the participants (*same-room* conditions) were instructed to wait in the same room for the questionnaires for the second part to be delivered before moving to the new study room. The other half of the participants (*new-room* conditions) was accompanied by one of the experimenters to the new room where they also had to wait for the arrival of the questionnaires.

While participants were waiting in either of the two rooms, they were handed a booklet and asked to answer a series of short questions pertaining to their judgments and decisions before the main questionnaires arrived. Half the participants (*consent-first* conditions) were first asked to read and sign a consent form for the second part of the study session before attempting these short questions. The other half were asked to answer the short questions before completing the consent form. We therefore employed a 2 (Waiting Location: Same Room vs. New Room) x 2 (Timing of Consent: First vs. Last) between-subjects design. Each group of participants who signed up for the same session of the experiment was randomly assigned to one of the four experimental conditions.

The booklet that participants received included a focal question (i.e., the main dependent variable) as well as a number of unrelated filler questions. In this focal question, participants were asked to predict their performance in the study that was about to be administered in the second part of the session. Specifically, they were told that in the main study, they would have to answer 10 multiple-choice mathematical/analytical questions. Participants were provided with two sample questions (see appendix C) and asked to predict how much time they would need to finish answering all 10 questions correctly. After participants had completed the booklet of questions and signed the consent form, they were told to raise their hands to alert the experimenter who, at this point, pretended to leave the room to collect the main questionnaires delivered to her. Subsequently, participants received the main questionnaires and were asked to proceed with answering the 10 questions. After answering all the questions, participants were thanked, debriefed, and paid for their participation. They were also probed by the experimenter to find out whether they were suspicious about the experimental procedure; none of the participants expressed any suspicion.

We posited that *where* participants had to wait was an incidental physical cue that served as a virtual boundary for the commencement of the second part of the session, such that participants waiting in the new room were more likely to have an in-system mindset (for the focal task in the second part) compared to participants waiting in the same room. In accordance with H2, we thus expected participants waiting in the new room to be more optimistic about the amount of time they would take to complete the focal task than those waiting in the same room. At a secondary level, among these latter participants (in the *same-room* conditions), we predicted that signing a consent form was an incidental informational cue that could also serve as a virtual boundary, such that those who signed the form before answering the booklet (and making their predictions) would be more optimistic about their performance in the focal task than those who signed the form later. However, the consent form would not have the same degree of effect on participants already waiting in the new room, since these participants had already crossed a virtual boundary (and adopted an in-system mindset) given their physical presence in the new room.

Results

A two-way ANOVA was performed to compare the natural log of participants' time estimates. The results showed no main effect of waiting location ($F(1, 62) = .001$, $p = .98$) or timing of consent ($F(1, 62) = 2.27$, $p = .14$), but an expected significant interaction between these two factors ($F(1, 62) = 34.43$, $p < .05$; see figure 2). Planned comparisons further revealed that, among participants waiting in the same room (who were outside the system), reading the consent form first led them to make a shorter time estimate for the main task ($M_{\text{consent -first}} = 2.32$) compared to participants who completed the consent form after making their predictions ($M_{\text{consent-later}} = 2.80$; $t(31) = -2.38$, $p < .05$). This result suggested that participants became more optimistic after they had crossed the virtual boundary of the second part of the session cued by signing the consent form, consistent with hypothesis H2. However, among participants already relocated to (and waiting in) the new room, who were more likely to have adopted an in-system mindset and increased their commitment to the second part of the session, the effect was attenuated: *when* they completed the consent form did not make a difference to their time estimates for the main task ($M_{\text{consent -first}} = 2.60$ vs. $M_{\text{consent -later}} = 2.52$; $t(31) = .46$, $p = .65$).

Insert figure 2 about here.

Discussion

Using a real-waiting scenario, experiment 3 showed that for participants who were still outside the system and had low initial commitment (i.e., waiting in the same room), signing a consent form for the subsequent task first led to a more optimistic prediction of the completion time for the task than signing the form later, presumably because the form served as a virtual boundary of the task: after people had crossed this boundary, they perceived themselves to be inside the system and became more optimistic about completing the present task. These results confirmed H2 and are consistent with the findings in prior literature about increased optimism in the implemental mindset (Taylor and Gollwitzer 1995). However, consistent with experiment 2, this effect was attenuated for people who had moved to the new room and thus were already "inside" the system.

Thus far, our findings have demonstrated that people become more optimistic about the task at hand after they have crossed the virtual boundary of the task situation which puts them in an in-system mindset. In the next two experiments, we examine whether this in-system mindset also makes one more action oriented and more inclined to put in cognitive effort in a subsequent task.

EXPERIMENT 4

Experiment 4 examined the interaction of different incidental cues on people's mindsets and accordingly their optimism and cognitive effort. In addition, while one might argue that the cues employed in the previous experiments (such as location of waiting or completing a consent form) could be an important part of the task system to a certain degree, in experiment 4, we manipulated in-system perception with an irrelevant cue (i.e., semantic framing) along with a membership badge.

Participants, Design, and Procedure

A total of 116 students in a North American university participated in this experiment to fulfill the research requirement of an introductory marketing course. As in experiment 3, all participants in this experiment were told that the session consisted of two unrelated parts. After participants had finished the first part, they were told to take a short break and then instructed to take their belongings and walk to another room in the laboratory where the second part would be administered. After they were seated in the new room, they were told that they would be completing a new-product-evaluation study.

Our manipulations were embedded within this basic scenario. Participants in the *waiting* conditions were informed that they had to *wait* for a few minutes for the new-product-evaluation study materials to be delivered. While waiting for the materials to arrive, they would be asked to complete some short tasks on judgment and decisions. In the *no-waiting* conditions, participants were told instead that before they began the new-product- evaluation study, they first had to complete some short tasks on judgment and decisions. In both conditions, participants completed the same judgment-and-decisions tasks before the main study. However, the time that was spent on these tasks was framed as "waiting time before the main study" in one condition but not in the other.

Furthermore, participants in half of the sessions were asked to wear a membership badge with the words "*Participants of the New Product Study Session*," whereas the other half of the participants were not asked to wear such a badge. By introducing this cue of wearing a badge, we intended to highlight participants' perceived group identity in this situation. To justify the need of wearing this badge in the former conditions, we told participants that the lab might also be occupied by participants from another study because of double booking; thus, the badge served to identify them from these other participants. This experiment therefore employed a 2 (Semantic Frame: Waiting vs. No Waiting) x 2 (Membership Badge: Yes vs. No) between-subjects design. Each group of participants who signed up for the experiment at the same time was randomly assigned to one of the four experimental conditions. In all conditions, participants completed the same set of tasks in the same sequence irrespective of whether they wore a badge or the manner in which the passage of time was framed.

Dependent measures. The main dependent measures of this experiment were included in the short judgment-and-decisions tasks that participants had to complete before the main new-product-evaluation study. Previous research has shown that when people identify themselves as part of a group, their commitment to the group activities is increased (Mottaz 1988). Further, higher commitment due to group identification results in a higher willingness to exert considerable effort into the activities carried out in the group (Ingersoll et al. 2000; Porter et al. 1974). Accordingly, in this experiment, besides a time-prediction question to replicate the optimism pattern we found in experiment 3, we also included questions to assess participants' cognitive effort as a result of the waiting framing and membership badge. Specifically, our DVs were as follows:

(a) Task-prediction question: Participants were asked to predict the amount of time they would spend on the main (new-product-evaluation) study after reading a brief description of the study (in which they would be asked to view a description of the features of a new product, and then answer some related questions including their evaluation of the product.) As in experiment 3, this question was designed to measure participants' optimism about their performance in the subsequent task.

(b) The three-item Cognitive Reflection Test (CRT, Frederick 2005): The CRT comprises a set of questions that require some amount of cognitive deliberation to derive the right answers. In the absence of deliberation, one is susceptible to common biased responses if they answer these questions too quickly without sufficient cognitive reflection. An example of such questions is "*A bat and a ball cost $1.10 in total. The bat costs a dollar more than the ball.*

How much does the ball cost?" The intuitive but erroneous answer is 10 cents, but some deliberation will show that the correct answer is actually 5 cents. We incorporated this set of questions in our study to compare the amount of cognitive effort participants expended and hence their degree of action orientation.

Results

Time estimate for the main study. Participants' time estimates replicated the pattern we found in experiment 3. Again, we took the natural log of the estimates and analyzed them using a two-way ANOVA. The results indicated a significant interaction between semantic frame and membership badge on their time estimates for the main study ($F(1, 112) = 3.80$, $p = .05$; see figure 3). Specifically, among participants who did not wear the badge, a *no-waiting* frame led to significantly more optimistic time estimates for the subsequent new-product-evaluation study than a *waiting* frame ($M_{\text{no-waiting}} = 2.23$ vs. $M_{\text{waiting}} = 2.62$, $t(52) = -2.34$, $p < .05$); on the contrary, among participants who had to wear the badge and thus perceived themselves to have crossed the virtual boundary (which presumably increased their task commitment; Mottaz 1988), the effect of semantic framing was attenuated such that their time estimates did not differ significantly whether they perceived themselves to have started the second session already or had to wait for it ($M_{\text{no- waiting}} = 2.40$ vs. $M_{\text{waiting}} = 2.38$, $t(60) = -.23$, p= .82).

Insert figure 3 about here.

CRT performance. We added the number of questions that participants answered correctly on the CRT and compared the average scores across conditions. We found a similar pattern as that of participants' time estimates for the main study: there was a significant interaction between the semantic frame and membership badge on their CRT scores ($F(1, 112) = 5.28$, $p < .05$; see figure 4). Specifically, for participants who did not wear the badge, a *no-waiting* frame led to significantly higher CRT scores than a *waiting* frame ($M_{\text{no-waiting}} = 1.87$ vs. $M_{\text{waiting}} = 1.23$; $t(55) = 2.43$, $p < .05$), suggesting that participants in the *no-waiting* condition expended more cognitive effort and acted on the task at hand more readily; in contrast, among participants who had to wear the badge and thus were already inside the system (which increased their task commitment and cognitive effort; Ingersoll et al. 2000; Porter et al. 1974), their CRT scores did not differ significantly across the two semantic frames ($M_{\text{no-waiting}} = 1.65$ vs. $M_{\text{waiting}} = 1.83$, $t(64) = -.76$, $p = .45$).

Insert figure 4 about here.

Discussion

Using incidental semantic and informational cues, this experiment conceptually replicated the finding in experiment 3 that crossing the virtual boundary increases optimism about task achievement. More importantly, the CRT results indicated that crossing this boundary activates an in-system mindset, leading people to become more action-oriented and invest more cognitive effort, providing support to H2. In addition, the results showed an attenuation of this in-system effect on optimism and action orientation in the presence of another incidental cue which had already helped participants cross the virtual boundary.

EXPERIMENT 5

Both experiments 3 and 4 provided evidence for the underlying process of the effect of incidental cues on task commitment, such that these cues serve as a virtual boundary for the task system; after people cross this boundary, they adopt an in-system mindset which is associated with greater optimism (experiments 3 and 4) and action orientation (experiment 4). In experiment 5, we wanted to further test the strength of these effects by examining whether the increase in optimism and action orientation also applies to unrelated judgment scenarios, while incorporating a very subtle semantic-framing manipulation to evoke an in-system mindset.

Participants, Design and Procedure

A total of 54 students in a North American university participated in this experiment to fulfill the research requirement of an introductory marketing course. As with experiments 3 and 4, this experiment was conducted during the waiting period between the first and second parts of a longer session. After participants had completed the first part of the session, they were asked to wait in the waiting area of the lab for the second part to begin (see appendix D for a sketch of the lab’s floor plan). Our manipulation of incidental semantic cue was introduced at this moment with a 2-level single-factor (Perceived Location of Waiting: Inside vs. Outside) between-subjects design; we alternated the experimental sessions between these two conditions.

In the *inside* condition, a research assistant (RA) asked participants to “please wait *inside* the waiting area” while standing at the lab entrance so that participants felt they were *inside* the area relative to the RA’s position. In the *outside* condition, in contrast, the RA asked participants to “please wait *outside* in the waiting area” while standing at the entrance of the experiment room (Room 1) so that participants felt they were *outside* relative to the RA’s position. While waiting, participants were asked to complete a series of short tasks on judgment and decisions.

Dependant measures. The short tasks on judgment and decisions included the following:

(a) Golf ball prediction: Participants were asked to imagine they had to hit a golf ball into a hole five meters away, and to estimate how many balls they thought they would be able to hit into the hole out of 100 attempts. If participants in the *inside* condition indeed adopted an in-system mindset and a more optimistic outlook, these participants would predict themselves to be able to hit more balls into the hole, as H2 would predict.

(b) Gamble choice: Participants were given six pairs of gambles and were asked to choose the one they would play in each pair (Slovic and Lichtenstein 1971; see appendix E). Each pair consisted of a P-bet (i.e., a bet with a high probability of winning a modest amount and a low probability of losing an even more modest amount) and a $-bet (i.e., a bet with a modest probability of winning a large amount and a large probability of losing a modest amount), with both bets having (almost) the same expected value. Based on H2, we expected participants in the *inside* condition to be more optimistic about the outcomes of their bets and to take more risks, such that they would be more likely to choose the more risky $-bets.

(c) Computer choice: To assess participants' action orientation, we adopted the computer-choice question from Xu and Wyer (2007). In particular, participants read the descriptions of two computers and were asked to either choose one of the two or to defer making a choice. We predicted that participants in the *inside* condition would be more action-oriented and would be more likely to choose one of the two computers than to defer their choice.

Results

Golf ball prediction. We observed a significant effect of perceived position of waiting: when participants were asked to wait "inside" the waiting area (i.e., by the RA standing at the lab entrance), they indicated a higher chance of hitting the ball into the hole than participants who were told to wait "outside" (i.e., by the RA standing at the experiment room entrance) (M_{inside} = 48% vs. $M_{outside}$ = 31%, $F(1, 52) = 3.89$, $p = .05$). This result suggests that a subtle incidental semantic cue can lead to an in-system mindset which increases optimism even in an unrelated judgment context.

Gamble choice. For the gamble choices, across all six pairs, we found a directional difference between the "inside" and "outside" conditions in terms of percentage of people choosing the more risky $-bets ($M_{inside}$ = 57% vs. $M_{outside}$ = 47%, $\chi^2(1) = 2.41$, $p = .12$). However, a separate post-test in which 20 respondents were asked to rate the riskiness of each bet on separate 1 (not risky at all) to 11 (very risky) scales showed that the $-bets in the first 4 pairs were not perceived to be risky ($M = 5.74$, $t(19) = -1.28$, $p = .22$, compared with the neutral point of 6), whereas the $-bets in the last two pairs were perceived as significantly risky ($M = 6.98$, $t(19) = 2.05$, $p = .05$, compared with the neutral point of 6). Therefore, we conducted a separate chi-square test based on the last two pairs; the results revealed that participants in the *inside* condition were more optimistic and indicated a stronger preference towards the riskier $-bets than participants in the *outside* condition (M_{inside} = 58% vs. $M_{outside}$ = 35%, $\chi^2(1) = 5.19$, $p < .05$).

Computer choice. A significantly larger percentage of participants waiting *inside* the waiting area chose one of the two computer options compared with participants waiting *outside* (M_{inside} = 79% vs. $M_{outside}$ = 50%, $\chi^2(1) = 4.83$, $p < .05$). This result indicates that an incidental semantic cue can activate an in-system mindset that prompts people to be more action-oriented in general, even in unrelated decision contexts. These results provided further support to H2.

Insert figure 5 about here.

Discussion

Overall, experiment 5 further confirmed H2 and demonstrated that very subtle semantic cues together with other supporting incidental cues (such as the position of other people in the decision environment) can enhance one's in-system mindset, increasing people's action orientation and optimism. In addition, the results of experiment 5 showed a spillover effect of increased optimism and action orientation in unrelated domains due to the implemental in-system mindset.

GENERAL DISCUSSION

Whether it is waiting in line to be served at the post office, or for a restaurant dinner to arrive while one's stomach growls in livid protest, many consumption contexts are characterized as task-oriented activities that involve a temporal and/or physical gap between the commencement of an activity and the actual activity itself. In this work, we extend previous research on waiting and suggest that this waiting process might be marked with a discontinuity. Specifically, we examine and demonstrate how incidental cues—be it physical, informational, or semantic—in the waiting environment can serve as a virtual boundary for the task-related environment. Once the boundary has been crossed, people perceive themselves to be "inside" the system, and consequently become more committed to the task at hand. This in-system mindset also leads to greater optimism and action orientation in general, and apply even to seemingly unrelated judgment and decision contexts.

We demonstrated in experiment 1 the basic effect of such incidental cues on people's commitment towards fulfilling the goal at hand, showing that the mere presence (vs. absence) of a long (vs. short) queue guide commonly situated next to a line in a post office can increase the salience of being part of the task system, causing people to be more inclined towards staying in line instead of paying an extra amount for express service. In experiment 2, using two other types of incidental informational cues in a visa-application context, we conceptually replicated the effect of incidental cues on task commitment while showing that this effect, however, is diminished when people are already in the system and committed to the current task; this interaction effect further provided evidence for our proposed virtual-boundary account.

Moving from hypothetical-waiting scenarios to real-waiting situations (in the lab), the next three experiments demonstrated the underlying process of the effects observed in experiments 1 and 2, as well as tested the degree to which this effect manifests in unrelated judgment situations. The results of experiments 3 and 4 indicated that the increased commitment towards the current task brought about by the presence of incidental cues is due to the activation of an implemental in-system mindset, characterized by an increase in optimism and action orientation. Finally, as shown in experiment 5, these effects apply even to judgment and decision contexts unrelated to the current waiting situation and when a very subtle semantic cue was employed to prime the existence of a virtual boundary for the task system. Although experiments 3-5 involved physical waiting in a waiting area, we believe that our framework generalizes to other scenarios that involve progression towards task-oriented activities.

Theoretical Implications and Future Research

Overall, the experimental results in this work provided convergent evidence for the effect of incidental cues in the waiting environment on task commitment. These results add to an existing body of work in the consumer behavior literature (Berger and Fitzsimons 2008; Chartrand et al. 2008; Childers and Houston 1984) that has demonstrated the unconscious effects of incidental cues on judgment and behavior. This work also contributes theoretically and empirically to the extant literature in goals and motivation in three ways. First, it extends Gollwitzer's (1999) mindset theory by demonstrating that, besides the conscious setting of goals as well as directing people towards implementation-related thoughts, incidental cues in the decision context can also prime the activation of an implemental in-system mindset and enhance task commitment. Second, this work provides further evidence that the general increase in optimism and action orientation can spill over to judgments and decisions unrelated to the current situation. Last but not least, our research indicates that, besides perceived gradual goal progress (Soman and Shi 2003) and goal proximity (Hull 1932; Kivetz, Urminsky, and Zheng 2006), the perception of whether one has crossed the virtual boundary and begun the process of goal attainment could also be a substantial motivational force.

Our findings are also consistent with the notion of perceived progress towards the goal, although we emphasize discontinuous progress rather than continuous progress. That is, when people are inside the system after crossing the virtual boundary cued by various incidental factors, they might perceive themselves to have made an abrupt progress towards their goal (rather than a gradual progress), and thus are more committed, optimistic, and action-oriented. Our own opinion is that the perception of progress is also a consequence of the presence of incidental cues rather than being an orthogonal construct. That said, future studies can further investigate the more nuanced roles of perceived goal progress, and relatedly, perceived sunk cost, in this phenomenon.

Another alternative explanation for our results is that our in-system manipulations (such as standing inside the queue guide or waiting in the new room) might have induced positive emotions whereas our out-system manipulations (such as standing outside the queue guide or waiting in the non-focal room) might have induced negative emotions, and it was this difference in participants' emotional states that led to different degrees of commitment, optimism, and action orientation. However, to our knowledge, there is no established positive correlation between positive mood and commitment or action orientation in the mood literature. In fact, recent findings in the mood literature showed that individuals in a negative mood are more likely to use a more systematic information-processing strategy that entails considerable attention to details compared to those in a positive mood (Schwarz 2002). This finding would suggest that people outside the system (who supposedly feel more negative) should have performed better in cognitive tasks such as the CRT (experiment 4)—a reversal of what we found. Nonetheless, future research could examine the potential role of mood or emotion in people's in-system mindset as a consequence of incidental cues in the environment.

Stemming from our current empirical findings, a number of other directions for further work seem worthwhile. First, while we have drawn an implicit line between task commitment and customer satisfaction in this work, the relationships between incidental cues, mindsets, and consumption satisfaction can be examined more directly. Second, the relative strength of different types of cues (e.g., informational, physical, or semantic) and their interactions are worth further investigation. Third, more work is desired to examine to what extent an in-system perception equates to an in-group perception which might make people more committed because they feel more privileged in their perceived status of being in-group. Lastly, future research can explore how the current work can be applied more broadly to other decision contexts that involve process initiation and commitment. For example, it is plausible that incidental cues in a project-group setting, such as giving a name to the project team, can help team members cross the virtual boundary of working together in the team, enhance their sense of camaraderie, and increase their overall commitment, irrespective of whether any actual work on the project has already begun. On a related note, another interesting research question is whether the cues have to be related with the initial stage of the process (e.g., giving a name to the project team at the start, or asking customers to review the menu while waiting). Will relating the cues with later stages of the process (e.g., deciding the place for celebration upon project completion even before any work on the project commences, or asking customers, while waiting for their food, to first complete the payment process) have a similar effect, or will these cues backfire and lower commitment due to illusionary task accomplishment? These questions deserve future research attention.

Managerial Implications

A clear pragmatic takeaway from this research is that managers can employ a host of incidental cues from their respective consumption environments to increase motivation and customer satisfaction. Whether it is simply placing a seemingly irrelevant object beside the queue, changing the color of the carpeting in a waiting area, adding an initial (albeit trivial) stage in the consumption process, or changing semantically the way in which consumption instructions are framed, it seems that there is considerable room for creativity in the employment of incidental cues to motivate customers.

In line with our findings, for example, a market research company that conducts online surveys ran a recent experiment in an attempt to get survey respondents to cross the virtual boundary sooner. The regular format of their surveys tells participants how many pages the surveys will have. A new, sectioned format not only informs participants of the total length of the surveys, but also breaks down the surveys into two sections: a brief introductory set of questions and a longer subsequent section. Results showed that the likelihood of respondents abandoning the survey is significantly lower in the sectional format than the regular format. We believe that the introductory part of the sectional format, which informs the respondent that they are completing the *first* section of the survey, might represent an informational cue that activates respondents' in-system mindset, leading to higher commitment and greater action orientation. Broadly speaking, nonetheless, the specific cues that different managers should use in their practice would no doubt have to depend on the characteristics of the specific consumption contexts involved.

While increasing customer satisfaction and thus consumer loyalty is certainly a natural objective that many marketers strive to fulfill, the current research also suggests that the role of incidental cues on consumption commitment can have much broader implications, particularly in situations where waiting versus not waiting might have vital life consequences. Take, for example, a patient waiting for a kidney transplant or to receive treatment for a life-threatening disease. In such cases, motivating consumers to persevere and maintain an optimistic outlook can have substantial impact on their overall well being (Taylor and Gollwitzer 1995; Taylor and Brown 1998, 1994). In an ongoing field application conducted by one of us in collaboration with a healthcare system, we use the virtual boundary idea to help cancer patients stay upbeat and optimistic. In this healthcare system, there are delays between the time that a non-threatening cancer is diagnosed and the first visit to the oncologist. These delays are often anxiety provoking. However, we find that a short phone call from a nurse to the patient acknowledging the receipt of the case, confirming basic information and offering to forward any questions alleviated the anxiety and resulted in patients being much more optimistic about their long-term prospects. As they say, “a good start is half the battle.”

REFERENCES

Ariely, Dan, George Loewenstein, and Drazen Prelec (2003), "Coherent Arbitrariness: Stable Demand Curves without Stable Preferences," *Quarterly Journal of Economics,* 118 (1), 73-105.

Berger, Jonah and Gráinne M. Fitzsimons (2008), "Dogs on the Street, Pumas on Your Feet: How Cues in the Environment Influence Product Evaluation and Choice," *Journal of Marketing Research*, 45(1), 1-14.

Chartrand, Tanya L., Joel Huber, Baba Shiv, and Rob Tanner (2008), "Nonconscious Goals and Consumer Choice*," Journal of Consumer Research,* 35, 189-201.

Childers, Terry and Michael Houston (1984), "Conditions for a Picture Superiority Effect on. Consumer Memory," *Journal of Consumer Research*, 11 (September), 643-54.

Dhar, Ravi, Joel Huber, and Uzma Khan (2007), **"**The Shopping Momentum Effect," *Journal of Marketing Research*, 44 (3), 370-78.

Frederick, Shane (2005), "Cognitive Reflection and Decision Making," *Journal of Economic Perspectives*, 19(4), 25-42.

Fujita, Kentaro, Peter M. Gollwitzer, and Gabriele Oettingen (2007), "Mindsets and Pre-Conscious Open-Mindedness to Incidental Information," *Journal of Experimental Social Psychology*, 43, 48-61.

Gollwitzer, Peter M. (1999), "Implementation Intentions: Strong Effects of Simple Plans," *American Psychologist, 54,* 493-503.

———, Heinz Heckhausen, and Birgit Steller (1990), "Deliberative and Implemental Mind-Sets: Cognitive Tuning toward Congruous Thoughts and Information," *Journal of Personality and Social Psychology*, 59 (6), 1119–27.

——— and Ronald F. Kinney (1989), "Effects of Deliberative and Implemental Mind-Sets on Illusion of Control," *Journal of Personality and Social Psychology,* 56, 531-42.

——— and Ute Bayer (1999), "Deliberative and Implemental Mindsets in the Control of Action," in *Dual-Process Theories in Social Psychology*, ed. Shelly Chaiken and Yaacov Trope, New York: Guilford, 403–22.

Hockenhull, Terence (2000), "Getting the Edge in Professional Selling: Queues, Numbers, and Time Wasting," *Business-World* (October 24), 1.

Hui, Michael, Mrugank Thakor, and Ravi Gill (1998), "The Effect of Delay Type and Service Stage on Consumers' Reactions to Waiting," *Journal of Consumer Research,* 24 (March), 469 – 479.

Hull, Clark L. (1932), "The Goal-Gradient Hypothesis and Maze Learning," *Psychological Review*, 39 (1), 25–43.

Ingersoll, Gail, Janet Kirsch, Sonna Merk, and Jeffrey Lightfoot (2000), "Relationship of Organizational Culture and Readiness for Change to Employee Commitment to the Organization", *Journal of Nursing Administration*, 30(1),11-20.

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, 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), February, 39-58.

Koo, Minjung and Ayelet Fishbach (2010a). A Silver Lining of Standing in Line: Queuing Increases Value of Products. *Journal of Marketing Research*, forthcoming.

——— and ——— (2010b). Climbing the Goal Ladder: How Upcoming Actions Increase Level of Aspiration. *Journal of Personality and Social Psychology*, forthcoming.

Larson, Richard (1987), "Perspectives on Queues: Social Justice and the Psychology of Queuing," *Operations Research,* 35(6), 895-905.

Lee, Leonard and Dan Ariely (2006), "Shopping Goals, Goal Concreteness, and Conditional Promotions," *Journal of Consumer Research*, 33(June), 60-70.

Leventhal, Howard, Robert Singer, and Susan Jones (1965), "Effect of Fear and Specificity of Recommendation upon Attitudes and Behavior," *Journal of Personality and Social Psychology*, 2(1), 20-9.

Lewin, Kurt (1951), Field Theory in Social Science; Selected Theoretical Papers. D. Cartwright (ed.). New York: Harper & Row.

——— (1952), Field Theory in Social Science : Select Theoretical Papers, London, Tavistock.

Lichtenstein, Sarah and Paul Slovic (1971), "Reversals of Preferences between Bids and Choices Gambling Decisions," *Journal of Experimental Psychology*, 89, 46—55.

Mottaz, Clifford J. (1988), "Determinants of Organizational Commitment," *Human Relations*, 41(6), 467-82.

Mullainathan, Sendhil and Eldar Shafir (2009), "Savings Policy & Decision-Making in Low-Income Households," In Michael Barr and Rebecca Blank (Eds.), *Insufficient Funds: Savings, Assets, Credit and Banking Among Low-Income Households.* Russell Sage Foundation Press (pp. 121-145).

Oakes, Steve (2003), "Musical Tempo and Waiting Perceptions," *Psychology and Marketing*, 20(8), 685-705.

Porter, Lyman W., Richard M. Steers, Richard T. Mowday, and Paul V Boulian (1974), "Organizational Commitment, Job Satisfaction, and Turnover among Psychiatric Technicians," *Journal of Applied Psychology*, 59(5), 603-9.

Pösl, I. (1994), *Wisderaufnahme Unterbrochener Handlundgen: Effekte der Bewußtseinslagen des Abwägens und Planens* [Mindset Effects on the Resumption of Disrupted Activates], Unpublished MA Thesis, LMU Munchen, Munchen, Germany.

Ross, Lee and Richard Nisbett (1991), *The Person and the Situation: Perspectives of Social Psychology*, Philadelphia: Temple University Press.

Schwarz, Nobert (2002), "Feelings as Information: Moods Influence Judgments and Processing Strategies," In: Thomas Gilovich, Dale Griffin and Daniel Kahneman (Eds): *Heuristics and Biases: The Psychology of Intuitive Judgment*, Cambridge.

Soman, Dilip and Mengze Shi (2003), "Virtual Progress: The Effect of Path Characteristics on Perceptions of Progress and Choice Behaviour," *Management Science,* 49(9), 1229 – 50.

Taylor, Shelley E. and Jonathan Brown (1988), "Illusion and well-being: A social psychological perspective on mental health," *Psychological Bulletin*, 103, 193-210.

——— and ——— (1994), "Positive illusions and well-being revisited: Separating fact from fiction," *Psychological Bulletin*, 116, 21-7.

——— and Peter M. Gollwitzer (1995), "Effects of Mindset on Positive Illusions," *Journal of Personality and Social Psychology, 69,* 213-226.

Xu, Jing and Robert Wyer (2007), "The Effect of Mind-Sets on Consumer Decision Strategies," *Journal of Consumer Research*, 34, 556-66.

——— and Robert Wyer (2008), "The Comparative Mind-set: From Animal Comparisons to Increased Purchase Intentions," *Psychological Science*, 19, 859-64.

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, 517-30.

APPENDIX A

EXPERIMENT 1: SKETCH OF THE LINE IN THE POST OFFICE

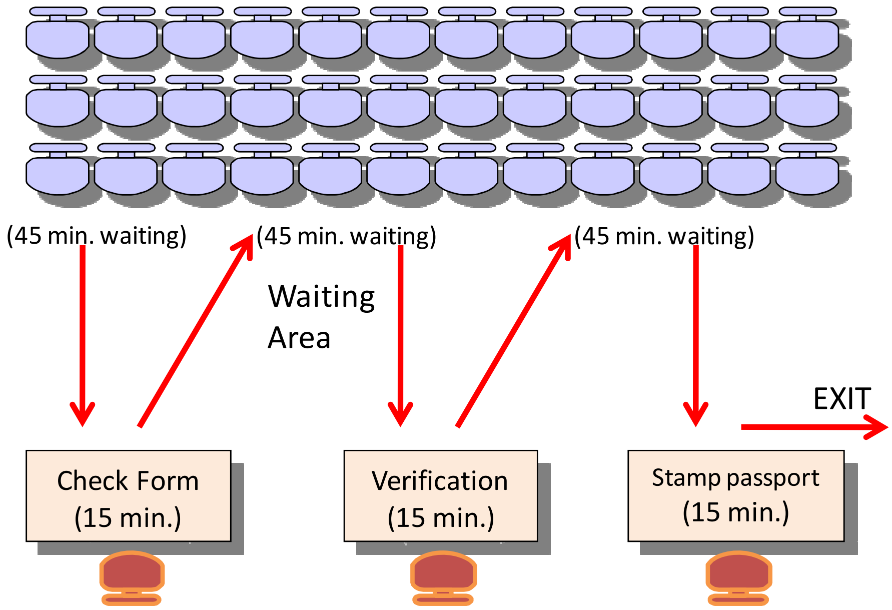
Long-guide condition:

Short-guide condition:

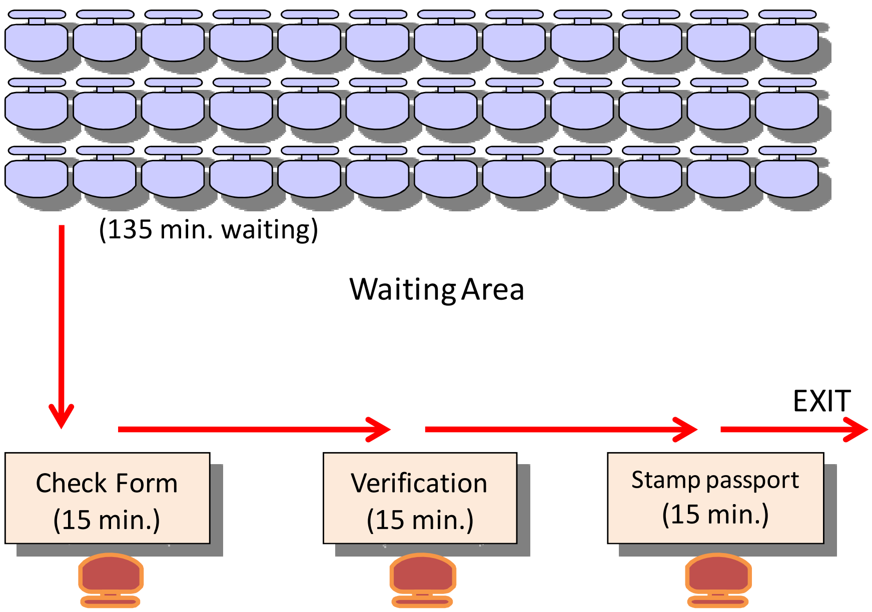
APPENDIX B

EXPERIMENT 2: SKETCH OF THE VISA APPLICATION PROCESS

Segregated Waiting:



Integrated Waiting:



APPENDIX C

EXPERIMENT 3: SAMPLE QUESTIONS

. **If you rearrange the letters "LNGEDNA" you have the name of a(n):**

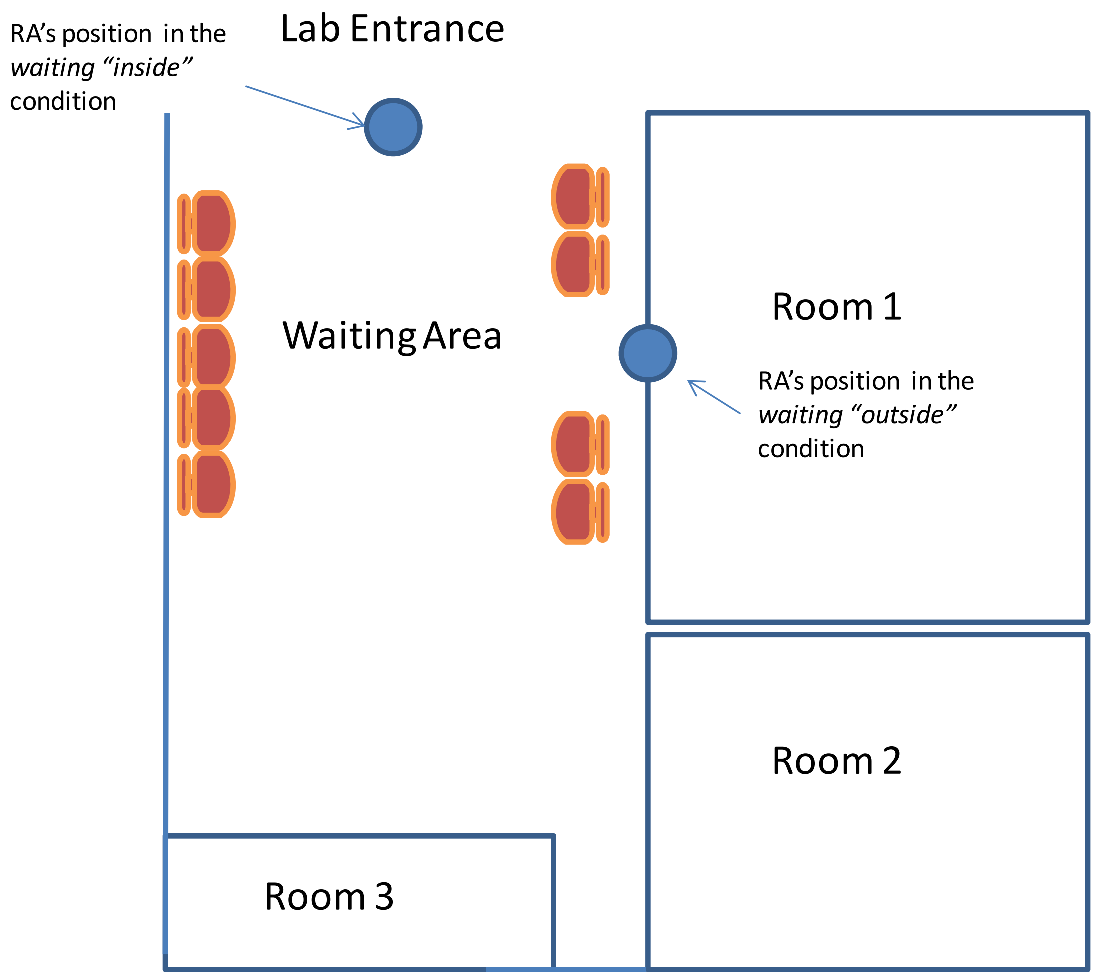
○ Animal ○ Country ○ State ○ City ○ Ocean

. **Which one of the numbers does not belong in the following series?**
1 - 2 - 5 - 10 - 13 - 26 - 29 - 48

○ 1 ○ 5 ○ 26 ○ 29 ○ 48

APPENDIX D

EXPERIMENT 5: SKETCH OF THE LAB AND RA'S POSITION



APPENDIX E

EXPERIMENT 5: GAMBLES CHOICES

For each of the following pairs of bets, which would you play? (Please circle ONE, either the left gamble or the right gamble.)

Pair 1:

99% Win $4 1% Lose $1	33% Win $16 67% Lose $2

Pair 2:

95% Win $2.50 5% Lose $0.75	40% Win $8.50 60% Lose $1.50

Pair 3:

95% Win $3 5% Lose $2	50% Win $8.50 50% Lose $1.50

Pair 4:

90% Win $2 10% Lose $2	50% Win $5.25 50% Lose $1.50

Pair 5:

80% Win $2 20% Lose $1	20% Win $9 80% Lose $0.50

Pair 6:

80% Win $4 20% Lose $0.50	10% Win $40 90% Lose $1

FIGURE 1: EXPERIMENT 2 RESULTS

PREFERENCES TOWARDS THE APPLY-IN-PERSON OPTION

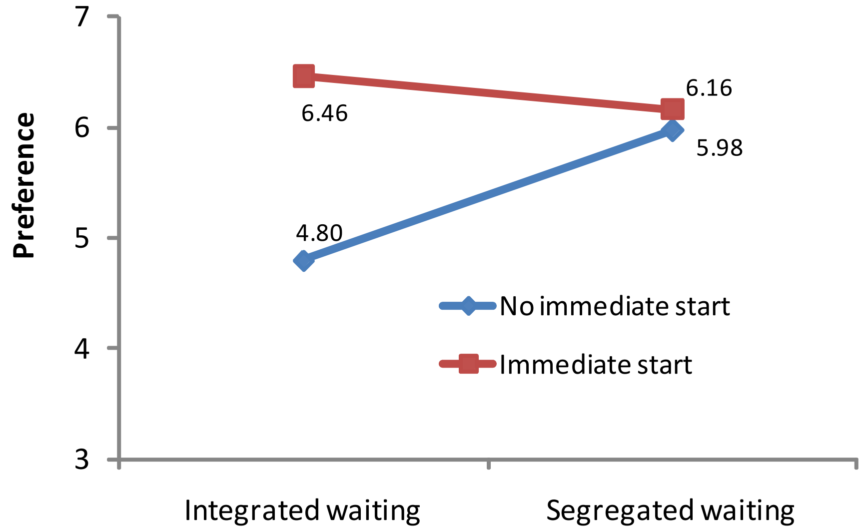


FIGURE 2: EXPERIMENT 3 RESULTS

TIME ESTIMATES FOR THE MAIN TASK

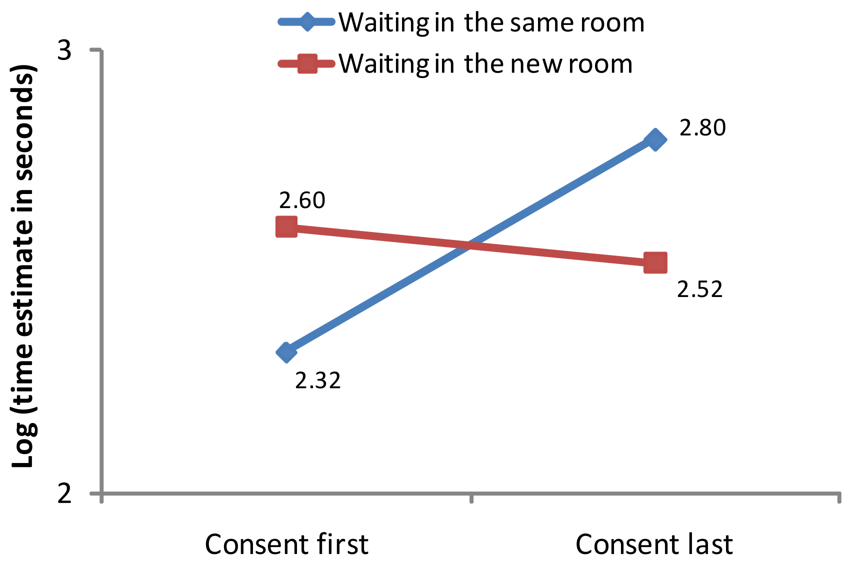


FIGURE 3: EXPERIMENT 4 RESULTS – TIME ESTIMATES FOR MAIN TASK

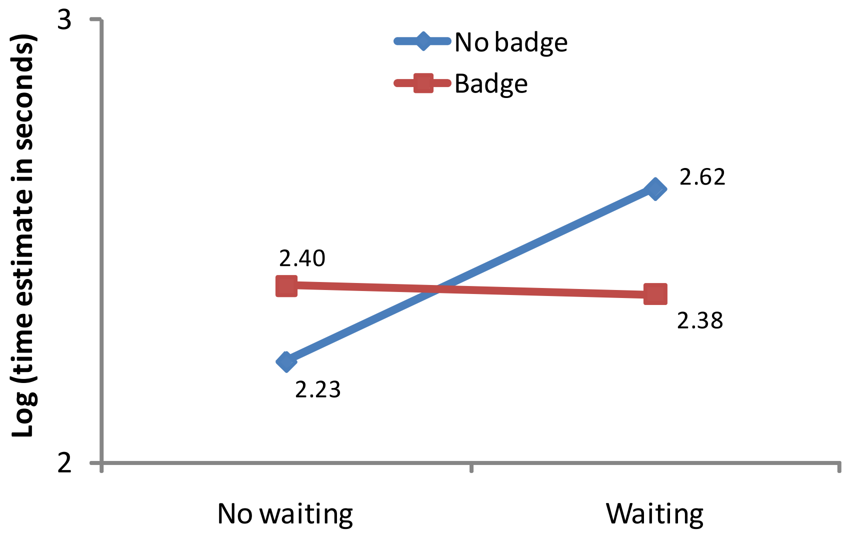


FIGURE 4: EXPERIMENT 4 RESULTS – CRT SCORES

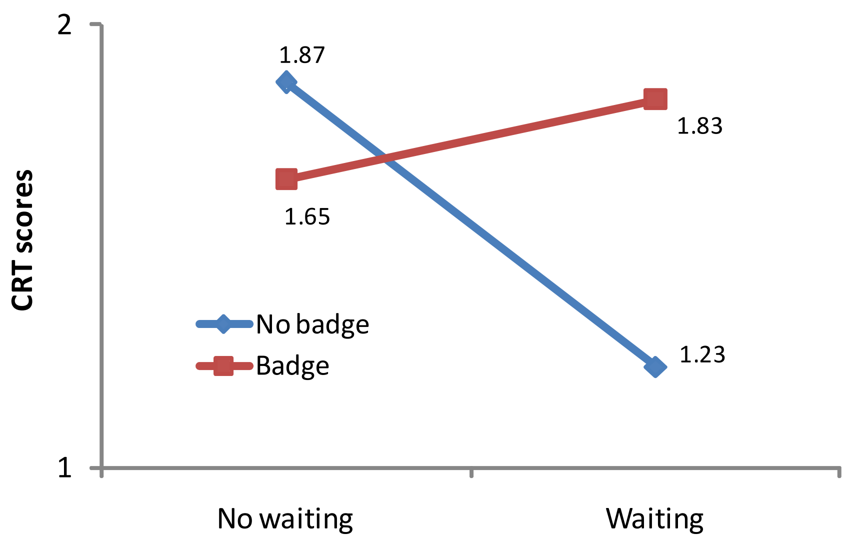


FIGURE 5: EXPERIMENT 5 RESULTS