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Does the mere crowdedness of the environment affect people's choices and preferences? In six studies, the authors show that social crowdedness not only leads to greater accessibility of safety-related constructs but also results in greater preference for safety-oriented options (e.g., preferring to visit a pharmacy to a convenience store), being more receptive to prevention- (rather than promotion-) framed messages, and being more risk averse with real money gambles. In support of the authors' underlying avoidance motivation perspective, these effects are mediated by participants' net prevention focus and are attenuated when the crowd in question consists of in-group members. The authors close by discussing the practical and theoretical implications of the results.

*Keywords:* crowding, personal space, social cognition, threat management, motivation

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## Conservative When Crowded: Social Crowding and Consumer Choice

Whether shopping for groceries at a local supermarket, making investment decisions on a trading floor, or eating at a busy restaurant, many important consumption decisions are made in the physical presence of others. The extent of this social presence—the level of crowdedness—can vary significantly across domains, time, and geography. For example, purchase decisions made in stores vary significantly in their crowdedness, with almost 30% of annual retail sales occurring during the holiday season, precisely when complaints of store crowdedness peak (International Council of Shopping Centers 2006). Seasonality aside, store traffic can vary significantly from day to day (e.g., being higher on weekends) as well as over the course of a particular day (e.g., being higher at lunchtime or later in the day). Given this considerable variation, a question of both theoretical and practical importance is whether and how crowd-

edness of the prevailing consumption environment influences consumer decision making. This is the focus of the present research.

The effect of social crowdedness on decision making has received little attention in the marketing literature. Although previous research has demonstrated that increased crowdedness can reduce shopper satisfaction and precipitate an earlier departure from the store (Eroglu, Machleit, and Barr 2005; Hui and Bateson 1991), there is a relative paucity of research examining how crowdedness might influence consumers' actual choices. In a rare exception, Xu, Shen, and Wyer (2012) extend Levav and Zhu's (2009) work on spatial confinement and variety seeking by revealing that reduced interpersonal distances can threaten consumers' perceptions of their own uniqueness, leading them to choose more distinctive products as a way of reasserting their individuality. Although we find this work on individuality compelling, our view is that the cognitive ramifications of being crowded likely extend significantly beyond these findings. In particular, we argue that an important consequence of being socially crowded is the precipitation of a defensive state, which results in the adoption of a prevention-oriented regulatory focus.

Perhaps the most germane concept in developing our research is the notion of personal space. Personal space is defined as a moveable boundary around the human body,

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primarily functioning as a buffer protecting people from potential threats and overstimulation (Delevoe-Turrell, Vienne, and Coello 2011; Graziano and Cooke 2006; Hall 1966). Considerable empirical research has demonstrated that personal space violations induce defensive responses (Felipe and Sommer 1966; Goffman 1963; McDowell 1972; Sommer and Becker 1969). For example, office workers exhibit more withdrawal behavior in an office with proximal workstations (Oldham and Fried 1987), and passengers are more likely to experience negative mood and stress on rush hour trains when they feel more crowded by other passengers (Evans and Wener 2007). The aim of the current research is to extend this line of study into the consumption domain. In particular, we hypothesize and demonstrate that socially crowded environments lead to activation of the avoidance system, which results in people adopting a more prevention-focused mindset. This, in turn, results in socially crowded people being more likely to choose options that provide prevention- than neutral-related benefits.

We organize the remainder of the article as follows. We begin by providing an overview of research on the motivational consequences of social crowding and personal space violations. We then present six experiments designed to explore the choice consequences of being socially crowded. These experiments enable us to make the following claims: First, people who are socially crowded are disproportionately more likely to prefer safety-oriented choice options, to undertake actual prevention-oriented behaviors, to avoid net present value positive gambles, and to be persuaded by prevention-framed messages. Second, these behavioral outcomes of crowding are mediated by an increased prevention focus. Third, consistent with our underlying avoidance motivation perspective, these effects are moderated by the composition of the crowd in question and are strengthened or weakened depending on whether the crowd is composed of out-group or in-group members, respectively. We conclude with a general discussion highlighting the theoretical contributions and practical implications of our research.

### *CROWDING, DEFENSIVE STATES, AND CHOICES*

#### *Personal Space Violations Lead to an Avoidance Response*

For the purposes of this research, we define “social crowding” as a large group of people gathered together such that the likelihood of an individual’s personal space being violated is significantly increased. The study of personal space and spatial perception in social contexts originated from observational research of the flight initiation distance maintained by animals. Hediger’s (1955) investigation of social distance in animal populations indicates that all species have a certain flight initiation distance below which the presence of others is considered an objective threat. He argues that, for any species, escape (i.e., securing personal safety) is biologically an even more urgent survival necessity than either reproduction or finding nutrition. Furthermore, he observes that the size of this flight initiation distance does not seem to be a simple stimulus-driven reflex but is determined by animals’ spatial cognition systems to construct a boundary of safety around their bodies (Hediger 1955), the penetration of which results in the perception of threat.

Subsequent researchers extended this concept of spatial boundaries to human social behavior and the development

of the construct of personal space. Hall (1966, p. 112) defines “personal space” as “a small protective sphere or bubble that an organism maintains between itself and others.” Many researchers have noted the existence of this protective space around the human body and have found that violations elicit defensive responses from victims (Dosey and Meisels 1969; McDowell 1972). These responses include flight or withdrawal (Barefoot, Hoople, and McClay 1972; Baum, Riess, and O’Hara 1974; Felipe and Sommer 1966) as well as classic defensive responses such as asocial behavior and increased hostility (Griffit and Veitch 1971). Indeed, recent neurological research has shown that personal proximity activates the amygdala, the structure involved in the “fight or flight” response (Kennedy et al. 2009).

That personal space violations lead to a fight or flight response seems likely to have been evolutionarily adaptive. Indeed, throughout history, attacks from other humans have been a major threat to human survival (see Neuberg, Kenrick, and Schaller 2011), with surprise attacks used to impose maximum fatalities on others (Boyer and Bergstrom 2011). As such, it is intuitive that personal space violations would activate the human defense system, which some researchers believe to have evolved to deal with environmental threats to physical survival (Lang, Bradley, and Cuthbert 1997). The activation of this defense system manifests as specific emotional states such as fear and anxiety (Gray and McNaughton 2000; McNaughton and Corr 2004). Because personal space violations are innately more likely in crowded settings, the abundant evidence showing that social crowding is sufficient to trigger an avoidance response is not surprising. For example, being crowded leads to the typical physiological symptoms of anxiety, such as increased skin conductance, high arousal, and low experienced pleasure (Aiello et al. 1977; Schaeffer and Patterson 1980; Worchel and Teddlie 1976).

#### *Choice Implications of an Avoidance Response*

Substantial empirical evidence has demonstrated that anxiety and avoidance motivations are associated with strong prevention goals, whereas happiness and approach motivations are associated with promotion goals (Förster et al. 2001; Förster, Higgins, and Idson 1998; Förster, Liberman, and Higgins 2005). A prevention goal, in turn, can influence the valuation of choice options by enhancing relative sensitivity toward potential losses and prevention-related benefits (e.g., being careful about health) instead of potential gains and promotion-related benefits (e.g., maximizing pleasure). Therefore, prevention-focused people are more likely to seek objects with personal safety connotations because these objects are instrumental in achieving the activated prevention goal (Markman and Brendl 2000). Similarly, from a regulatory fit perspective, prevention-focused people experience regulatory fit when they choose objects with safety implications because these alternatives align with their goal orientation (i.e., a prevention goal). As such, people may more readily choose these options because it feels appropriate to them to choose an option that fits their regulatory focus (Higgins 2000). The effects of regulatory fit are not narrowly limited to choice effects per se, but they can moderate a variety of marketing-relevant behavioral outcomes, such as the perceived persuasiveness of messages

when there is congruence between regulatory focus and message frame. For example, prior research has demonstrated that when prevention goals are more active, a loss-framed message is more effective than a gain-framed message (Lee and Aaker 2004). Put differently, people with a prevention focus are more receptive to a loss-framed message than a gain-framed one because it leads them to experience greater regulatory fit.

In summary, research on personal space violations and social crowding has essentially converged around the broad finding that being crowded induces a defensive/avoidant response characterized by stress and anxiety. Furthermore, research on regulatory focus has suggested that an avoidant response is associated with an increased prevention orientation. Thus, we expect that crowded people are more likely to choose options with safety connotations because they feel more comfortable choosing an option that fits their current regulatory focus. More specifically, we hypothesize that people in socially crowded environments will be more likely to choose options that provide prevention- than neutral-related benefits. Furthermore, these choice consequences will be mediated by a measure of people's net prevention/promotion focus.

#### Research Overview

In the current research, we investigate whether social crowdedness systematically moderates consumer preference regarding product/service alternatives. Specifically, we propose that a prevention-focused mindset invoked by being crowded leads to an increased affinity for safety-oriented choice alternatives. Six studies support our conceptualization. A pilot study demonstrates that people who imagine themselves in a crowded (vs. uncrowded) scene subsequently display a greater relative prevention focus. Study 1 uses a naturalistic crowding manipulation to demonstrate that being socially crowded leads to both a greater preference for safety-related choice options and to increased accessibility to safety-related words. Study 2 provides process evidence for our conceptualization and reveals that the effects of crowding on choice are mediated by an increase in net prevention focus. Study 3 identifies a theoretically consistent moderator; that is, the link between social crowding and prevention-oriented choice is attenuated when the crowd is composed of in-group (vs. out-group) members. Study 4 uses a real behavioral choice (whether to floss one's teeth) to demonstrate that being socially crowded leads to greater susceptibility to prevention-framed messages. Finally, extending our investigation to risk tolerance in general, Study 5 reveals that being crowded results in people being more conservative when making real money gambles.

#### PILOT STUDY: SOCIAL CROWDING AND PREVENTION FOCUS

We designed the pilot study as an initial test to assess whether social crowdedness has the potential to influence people's regulatory focus. To this end, we exposed participants to a picture of either a crowded or an uncrowded outdoor scene and asked them to imagine how they would feel if they were in the pictured context. A regulatory focus questionnaire was subsequently administered as a supposedly unrelated study.

#### Method

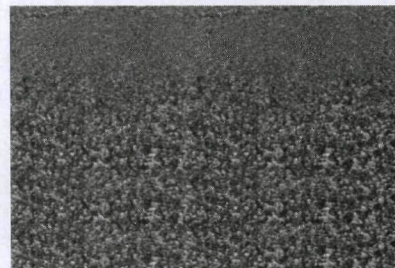
Thirty-four undergraduate students from a North American university participated in this study for payment. First, in a supposed picture perception study, participants were presented with one of the two pictures of an outdoor scene (crowded vs. uncrowded; see Figure 1, Panels A and B) and were asked to spend a few moments looking at the image before briefly describing how they would feel if they were in the presented scene. Next, in an ostensibly unrelated study, a questionnaire designed to measure participants' incidental regulatory focus was administered (developed by Sengupta and Zhou [2007], following Higgins et al.'s [1994] approach), presented as research about concerns in daily life. Participants were asked to rate the importance of 14 issues on a nine-point scale (1 = "totally unimportant," and 9 = "extremely important"). Seven items captured a promotion focus (e.g., "being smart," "making new friends"), and the rest measured a prevention focus (e.g., "not making enemies," "avoiding getting fat"). We summed total scores

Figure 1  
PILOT STUDY AND STUDIES 2, 4, AND 5: PRIMING STIMULI

A: *Uncrowded Prime*<sup>ab</sup>



B: *Crowded Prime*<sup>ab</sup>



C: *Cluttered Prime*<sup>b</sup>



<sup>a</sup>Used in pilot study, Study 4, and Study 5.

<sup>b</sup>Used in Study 2.

for both prevention and promotion, with the net differences between them serving as the net regulatory focus measure (Sengupta and Zhou 2007).

*Results and Discussion*

First, given the research linking personal space violations with increased anxiety (e.g., Hall 1966), we counted the number of anxiety-oriented words each participant used in describing how they would feel in the pictured scene. As expected, participants primed with the crowded picture generated more anxiety-related words ( $M = .89, SD = .76$ ) than did participants primed with the uncrowded picture ( $M = .19, SD = .40; t(32) = -3.30, p < .01$ ).

Turning to the regulatory focus questionnaire, whereas participants in both conditions indicated a similar level of promotion focus ( $M_{\text{Crowded}} = 27.22, SD = 4.61$  vs.  $M_{\text{Uncrowded}} = 29.25, SD = 3.23$ ), participants in the crowded condition reported higher prevention scores ( $M = 42.28, SD = 3.95$ ) than those in the uncrowded condition ( $M = 34.68, SD = 3.61$ ). To create a single measure of regulatory focus, we subtracted the summed importance scores for the promotion items from the equivalent summed prevention item scores (see Lockwood, Jordan, and Kunda 2002), with higher scores on this index suggesting a greater net prevention focus (see also Sengupta and Zhou 2007). Using this measure, participants in the crowded condition displayed a stronger net prevention focus ( $M_{\text{Crowded}} = 15.05, SD = 5.72$ ) than did those in the uncrowded condition ( $M_{\text{Uncrowded}} = 5.43, SD = 5.57; t(32) = -4.95, p < .001$ ). Thus, the mere act of imagining being in a crowded or uncrowded environment was apparently sufficient to substantially alter participants' regulatory focus. With this baseline result established, in the next study we explore whether this crowding-induced prevention focus results in an increased preference for safety-oriented choice alternatives.

*STUDY 1: SOCIAL CROWDING AND PREFERENCE FOR SAFETY-ORIENTED OPTIONS*

Study 1 had two primary goals. First, because the pilot study relied on a priming task to manipulate social crowdedness, a key objective of Study 1 was to manipulate crowding directly and naturalistically, which we accomplished by having participants complete tasks in a laboratory room that was either crowded or uncrowded with other research participants. Second, because we wanted to explore whether being socially crowded would lead people to adopt a more safety-oriented mindset, we examined whether socially crowded people would exhibit increased accessibility to safety-related constructs (Bargh et al. 2001; Förster, Liberman, and Higgins 2005) and show a greater preference for safety-oriented products.

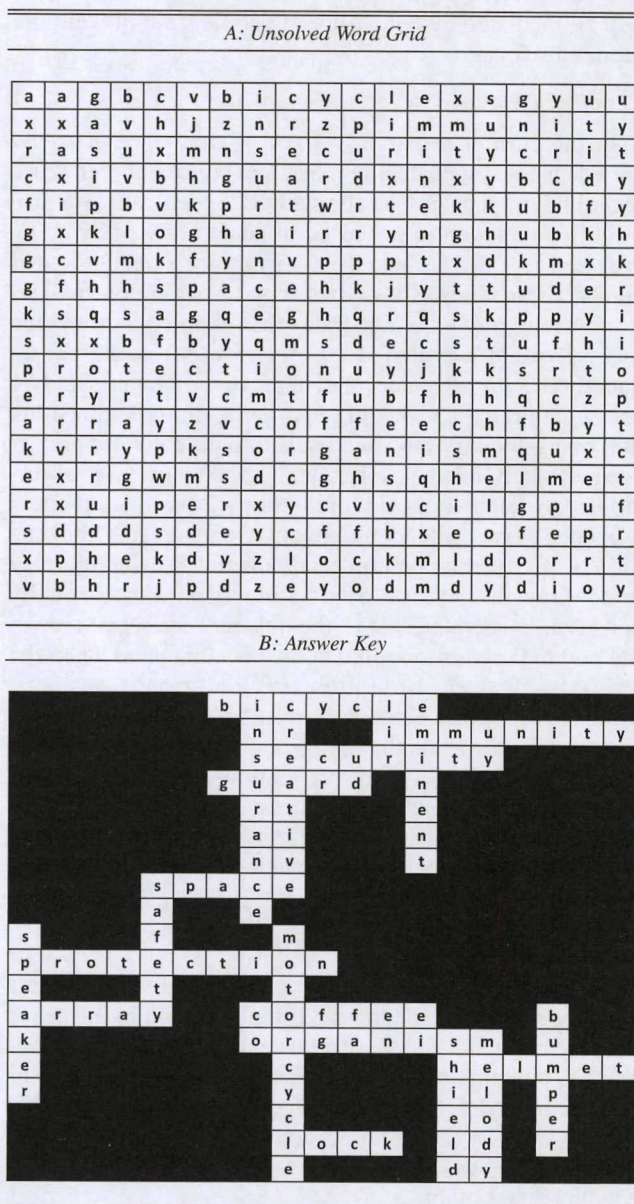
*Method*

Seventy-three undergraduate students from a North American university participated in this study for payment, participating in two experimental sessions on the same day. In the first session, participants completed a task for an unrelated study and were then asked to return for the prescheduled second session. At this time, participants were randomly assigned to either a crowded session (ten participants per room) or an uncrowded session (two or three participants per room), with all sessions being held in the same

small laboratory room. Upon arrival, participants were asked to complete a word search task that was purported to be a mind-clearing exercise in preparation for the experiment but was actually designed to assess their accessibility to safety-related constructs. For this task, a grid of letters was presented on a sheet of paper (see Figure 2), with ten safety-related words (e.g., “immunity,” “insurance,” “helmet”) and ten neutral words (e.g., “melody,” “speaker,” “coffee”) embedded vertically and horizontally. Participants were asked to write down all the words they could find in three minutes.

After the word search task, participants completed two ostensibly unrelated tasks designed to explore their preference toward making choices with prevention-oriented benefits. These tasks were presented as scenarios in which participants indicated their relative preference between two stores they could visit during a delayed flight (pharmacy vs. con-

Figure 2  
STUDY 1: WORD GRID



venience store) and between two free promotional gifts at a local store (first aid products vs. a box of cookies). Participants indicated their preferences for both the store and the product choice on two seven-point rating scales (1 = "definitely choose convenience store/cookies," and 7 = "definitely choose pharmacy/first aid products"). Finally, participants were asked to rate how crowded they found the room to be on a seven-point scale (1 = "not crowded," and 7 = "very crowded").

### Results and Discussion

**Manipulation check.** As we expected, participants in crowded sessions reported that they felt more crowded ( $M = 4.87$ ,  $SD = 1.65$ ) than those in uncrowded sessions ( $M = 2.95$ ,  $SD = 1.49$ ;  $t(71) = 5.15$ ,  $p < .001$ ). Thus, the manipulation of perceived crowdedness was successful.

**Word search task.** Although participants in both conditions found a similar number of non-safety-related words ( $M_{\text{Crowded}} = 3.7$ ,  $SD = 1.42$  vs.  $M_{\text{Uncrowded}} = 4.16$ ,  $SD = 1.54$ ;  $p = .2$ ), participants in the crowded room uncovered a greater number of safety-related words ( $M = 5.86$ ,  $SD = 1.81$ ) than those in the less-crowded room ( $M = 3.77$ ,  $SD = 1.57$ ;  $F(1, 71) = 27.8$ ,  $p < .001$ ). Therefore, it seems that safety-related constructs were indeed more accessible to participants in the crowded room.

**Safety-oriented preferences.** Participants in the crowded condition reported that they were more likely to choose to go to a pharmacy than to a convenience store ( $M = 4.53$ ,  $SD = 1.83$ ) than did those in the uncrowded room ( $M = 3.63$ ,  $SD = 1.21$ ;  $F(1, 71) = 6.45$ ,  $p < .02$ ). Similarly, those in the crowded condition indicated a stronger preference for first aid products than cookies ( $M = 4.83$ ,  $SD = 1.78$ ) compared with those in the uncrowded condition ( $M = 3.51$ ,  $SD = 1.47$ ;  $F(1, 71) = 11.98$ ,  $p < .001$ ). Thus, for both the store choice and product choice measures, being crowded led participants to report a stronger preference for the safety-oriented option. These data, therefore, build on the pilot study by demonstrating that personal preferences are predictably influenced by the social crowdedness of the environment. In Study 2, we explore whether a prevention focus mediates these effects.

### STUDY 2: MEDIATION BY PREVENTION FOCUS

We designed Study 2 to build on the preceding studies in three ways. First and foremost, we wanted to establish whether a greater net prevention focus mediates the observed effects on safety-oriented choice. Second, we included a true no-prime control condition to better assess baseline preferences toward the choice options. Third, because a possible (though unlikely) alternative explanation for the results of the first two studies is that the effects were caused not by social crowding but by visual clutter (which is innately confounded with increased crowdedness), Study 2 includes an additional condition to explore the effect of visual clutter.

### Method

One hundred undergraduate students from a North American university participated in this study for payment. As in the pilot study, we used a picture priming technique to manipulate perceptions of crowdedness. Specifically, participants were randomly assigned to one of four conditions:

crowded, uncrowded, cluttered, or no-image control. The crowded and uncrowded images were identical to those used in the pilot study (see Figure 1, Panels A and B), and the cluttered image showed a highly cluttered office scene (see Figure 1, Panel C). As in the pilot study, participants in the three conditions with pictures were asked to imagine themselves in the pictured scene and to briefly describe how they would feel. Participants in the control condition proceeded straight to the rating tasks. All participants were then presented with the same store and product rating tasks used in Study 1. Finally, participants completed the same regulatory focus questionnaire used in the pilot study.

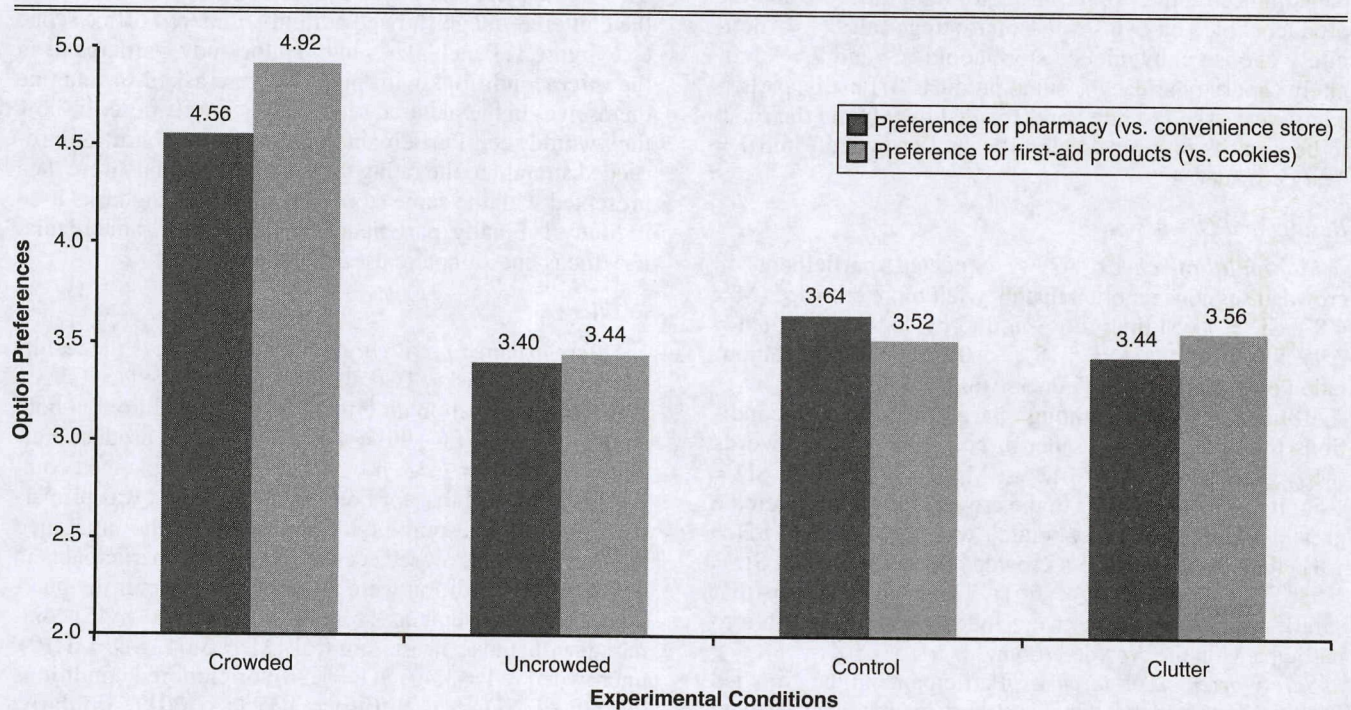
### Results

**Safety-oriented preferences.** Figure 3 displays the results for both rating tasks. Two analyses of variance (ANOVAs) revealed an overall main effect of image condition on both store preference ( $F(3, 96) = 4.17$ ,  $p < .01$ ) and product preference ( $F(3, 96) = 6.33$ ,  $p < .001$ ). Follow-up planned comparisons revealed that for both tasks, this effect was primarily driven by responses of participants who imagined themselves in a crowded scene. Specifically, participants in the crowded condition were more likely to prefer the pharmacy to the convenience store ( $M = 4.56$ ,  $SD = 1.45$ ) compared with those in the control ( $M = 3.64$ ,  $SD = 1.19$ ), uncrowded ( $M = 3.40$ ,  $SD = 1.26$ ), or cluttered conditions ( $M = 3.44$ ,  $SD = 1.42$ ;  $t(96) = 3.47$ ,  $p < .001$ ). Similarly, those in the crowded condition were more likely to prefer first aid products to cookies ( $M = 4.92$ ,  $SD = 1.52$ ) compared with those in the control ( $M = 3.52$ ,  $SD = 1.08$ ), uncrowded ( $M = 3.44$ ,  $SD = 1.47$ ), or cluttered conditions ( $M = 3.56$ ,  $SD = 1.50$ ;  $t(96) = 4.34$ ,  $p < .001$ ). Finally, participant preferences in both rating tasks showed no significant differences between the control, uncrowded, and cluttered conditions in both choice tasks ( $t(72) = -.44$ ,  $p > .6$ ).

**Prevention focus.** Whereas we found participants in all conditions to have a similar level of promotion focus ( $M_{\text{Control}} = 29.56$ ,  $SD = 7.74$ ;  $M_{\text{Crowded}} = 28.88$ ,  $SD = 3.17$ ;  $M_{\text{Uncrowded}} = 28.56$ ,  $SD = 6.56$ ;  $M_{\text{Cluttered}} = 28.64$ ,  $SD = 4.13$ ), participants in the crowded condition had higher prevention scores ( $M = 38.80$ ,  $SD = 4.83$ ) than those in the control ( $M = 28.44$ ,  $SD = 6.05$ ), uncrowded ( $M = 27.52$ ,  $SD = 6.45$ ), or cluttered conditions ( $M = 28.56$ ,  $SD = 3.23$ ). In considering the net position, participants in the crowded condition demonstrated a dramatically stronger net prevention focus ( $M = 9.92$ ,  $SD = 6.24$ ) than did those in the uncrowded ( $M = -1.04$ ,  $SD = 9.28$ ), control ( $M = -1.12$ ,  $SD = 11.39$ ), or cluttered conditions ( $M = -.08$ ,  $SD = 5.61$ ;  $t(96) = 5.46$ ,  $p < .001$ ). Notably, the lack of difference between the control and uncrowded conditions (for both the rating tasks and the prevention focus measure) reveals that the cognitive ramifications of crowdedness are a function of high crowdedness and that no reciprocal effects exist in an uncrowded environment (i.e., uncrowded environments are not associated with a promotion focus).

**Mediation analysis.** Drawing on Preacher and Hayes (2004), to better evaluate the underlying mechanism, we examined the indirect effect of the level of crowdedness on preferences for both prevention-oriented choice options through participants' incidental net prevention focus score. Because there are three conditions for crowdedness, we used two dummy variables to represent uncrowdedness and

Figure 3  
STUDY 2: RELATIVE PREFERENCE TOWARD SAFETY-ORIENTED OPTIONS BY CONDITION



crowdedness in the regressions. Using 5,000 bootstrap samples, these analyses revealed significant indirect effects of the crowdedness dummy on preferences for both the safety-oriented choice options through the net prevention score with a 95% confidence interval, excluding zero (store preference:  $-.44$  and  $-.05$ ; product preference:  $-.54$  and  $-.08$ ). Specifically, when we included net prevention score in the regression, the direct effect of the level of crowdedness on safety-oriented choices became nonsignificant ( $\beta = -.23$ ,  $t = -1.09$ ,  $p > .27$ ). Thus, this analysis shows that the prevention orientation invoked by personal space violation mediated the influence of crowdedness on safety-oriented choices. For a step-by-step breakdown of the mediation analyses, see Table 1.

#### Discussion

The results of Study 2 support our hypothesis that being socially crowded leads to a prevention focus, which itself influences preferences toward choice options with safety connotations. These data also rule out an alternative explanation of the core effect by demonstrating that a purely cluttered

image has no effect on either the net prevention focus score or the rating tasks. Indeed, both the incidental regulatory focus score and the preference ratings in the cluttered condition were similar to those in the control condition, providing evidence that effects of social crowding are distinct from those of visual clutter. In the next study, we explore an important potential moderator of this core effect: the composition of the crowd.

#### STUDY 3: DOES THE COMPOSITION OF THE CROWD MATTER?

Given early work identifying social distance as an input to a broader threat assessment (Hediger 1955) and more recent research linking personal space violations with activation of the avoidance system (Lang, Bradley, and Cuthbert 1997), it is reasonable to question whether a crowd's composition affects the degree of threat people perceive it to represent. Indeed, building on Hall's (1966) initial conceptualization of spatial violations, Stokols (1972) argues that a person's response to a crowd is determined not only by the innate spatial restrictions it causes but also by his or her relationship (if any) with the members of the crowding group. Put simply, "social and personal dimensions ... interact with spatial factors to mediate the experience of crowding" (Stokols 1972, p. 275). More specifically, Stokols suggests that the restrictive aspects of crowding-induced spatial limitation are rendered less salient when the relationship with the crowding group is "friendly and cooperative" (Stokols 1972, p. 275). Consistent with this theorizing, it is intuitive to expect that a person would experience more uncertainty when confronted by a crowd of strangers—which would likely result in an assessment of greater potential threat—compared with a crowd of known people. In this

Table 1  
STUDY 2: RESULTS OF MEDIATION ANALYSIS

|   | <i>B</i> | <i>t</i>        | <i>p-Value</i> |
|---|----------|-----------------|----------------|
| Levels of crowding predicting store preference                      | -.7      | $t(73) = -3.49$ | $p < .001$     |
| Levels of crowding predicting prevention focus                      | -5.52    | $t(73) = -4.23$ | $p < .001$     |
| Prevention focus predicting store preference                        | .04      | $t(72) = 2.59$  | $p < .01$      |
| Prevention focus and levels of crowding predicting store preference | -.23     | $t(72) = -1.09$ | $p > .27$      |

regard, our first three studies mirror much of the literature on crowding and spatial violations in that our experimental manipulations of crowdedness rely primarily on exposing participants to crowds of strangers or out-group members.

This distinction is important because, in addition to the intuition that strangers represent a greater threat, prior research has suggested that people have differing perceptions of crowds depending on whether they are composed of in-group or out-group members. Certainly, a central finding of social identity theory is that people tend to show in-group favoritism and out-group antagonism (Hogg and Abrams 1988; Turner, Brown, and Tajfel 1979). For example, in a study examining volitional (rather than imposed) social positioning, Shah, Brazy, and Higgins (2004) find that participants who were expecting to engage in competition tended to choose a seat closer to an in-group member (their teammate) than to an out-group member (a competitor). Of more direct relevance to our work, Glick, DeMorest, and Hotze (1988) find that, for people in close proximity, out-group members produced more anxiety and less compliance with a small request than did in-group members. Finally, Schultz-Gambard (1977) observes that high-density groups could actually be experienced positively when the group is composed of in-group members. Given these findings, we hypothesize that a crowding-induced prevention focus (and, thus, the associated preference for safety-oriented products observed in our first three studies) will be strengthened (weakened) for a crowd composed of out-group (in-group) members.

#### Method

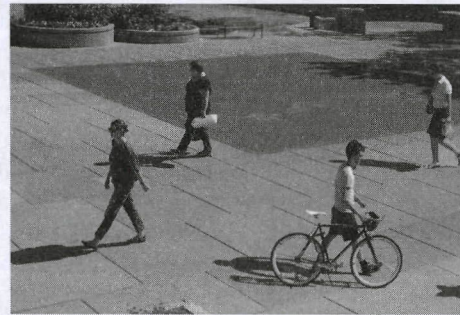
**Participants and design.** This study used a 2 (crowdedness: crowded vs. uncrowded)  $\times$  2 (group membership: in-group vs. out-group) design with an additional no-crowd control condition. Four hundred participants from a general online subject pool (who passed two attention checks) participated in this study for payment and were randomly assigned to one of the five conditions.

**Procedure.** Participants first completed a group membership manipulation task (Tajfel et al. 1971) that previous research has shown to reliably manipulate perceptions of whether a certain group is perceived as in-group or out-group. Specifically, participants were told they would be completing an exercise that would test their ability to quickly estimate the total number of dots in different images. They were further told that people can be reliably divided into two cognitive categories (i.e., dot overestimators and dot underestimators), that these two groups are distinguished by multiple factors (e.g., analytical problem solving ability, degree of cognitive bias, literacy, mathematical ability, social competence), and that the dot estimation task would determine their group classification. Participants were then exposed to ten different pictures comprised of multiple dots for half a second each, after which they were asked to estimate the number of dots in each image. After the ten rounds of estimation, all participants were told that they had been classified as dot underestimators, thus instantiating the underestimator (overestimator) groups as an in-group (out-group).

Next, as in the pilot study and Study 2, in a supposed picture perception task, participants were exposed to the crowded or uncrowded images (see Figure 4). However, in this case, both pictured groups were presented as consisting

Figure 4  
STUDY 3: PRIMING STIMULI

A: Uncrowded Prime



B: Crowded Prime



of either dot underestimators (i.e., in-group members) or dot overestimators (i.e., out-group members). To ensure that the scenario seemed legitimate, participants were told that the pictures were taken at a convention organized by researchers investigating the dot estimation phenomenon and to which they had invited both over- and underestimators. Participants were instructed to visualize the scenario in as much detail as possible and to describe how they would feel if they were in the scene. Finally, to strengthen the manipulation, participants in the in-group (out-group) conditions were next asked to describe three ways in which they felt similar to (different from) the dot underestimators (overestimators) in the picture. Participants in the no-crowd group, used as a control condition to measure baseline preferences, were not presented with a picture and were directed immediately to the preference task.

Next, in an ostensibly unrelated task, participants completed the pharmacy versus convenience store rating task from Studies 1 and 2. Participants again indicated their preference on a seven-point rating scale (1 = "definitely choose convenience store," and 7 = "definitely choose pharmacy"). Finally, participants completed a manipulation check question designed to confirm that they identified more with underestimators than overestimators. Responses were captured on a seven-point scale (1 = "I identify with dot underestimators a lot more than I do dot overestimators," and 7 = "I identify with dot underestimators a lot less than I do dot overestimators"), with 4 representing neutrality ("I identify with dot underestimators and dot overestimators to about the same degree").

## Results

**Data cleaning.** Due to the typical data quality issues that arise when using an online panel, we first cleaned the data by excluding participants whose completion time indicated a lack of attention (vs. an average of 12 minutes). In particular, we conservatively excluded participants who completed the survey too quickly (less than 4 minutes, only achievable through speed completion without paying attention) or too slowly (more than 30 minutes, indicating participant distraction and/or not completing the study in a single sitting). As a result, we excluded 20 participants from the data set, which resulted in 380 data points for the following analyses. This exclusion of data points marginally strengthened the effects.

**Manipulation check.** The in-group manipulation seemed to be successful because participants indicated that they identified more with dot underestimators ( $M = 3.33$ ,  $SD = 1.36$ ;  $t(379) = -9.7$ ,  $p < .001$ ). Moreover, we found no differences in the manipulation check across the crowding or type of group conditions (both  $ps > .5$ ).

**Safety-oriented preferences.** As Figure 5 illustrates, the 2 (crowdedness: crowded vs. uncrowded)  $\times$  2 (group membership: in-group vs. out-group) ANOVA with store preference rating as the dependent variable revealed no main effect of crowding or type of crowd. However, we did find a significant interaction between the two ( $F(1, 300) = 3.89$ ,  $p < .05$ ).

Simple effect analyses revealed that this interaction was primarily driven by participants in the crowded conditions being more likely to choose to go to the pharmacy when the crowd was composed of out-group members ( $M = 5.26$ ,  $SD = 2.03$ ) than in-group members ( $M = 4.47$ ,  $SD = 2.35$ ;  $F(1, 300) = 4.72$ ,  $p < .04$ ). In the uncrowded condition, however, the type of group made no statistically discernible difference ( $M_{\text{Out-group}} = 4.61$ ,  $SD = 2.32$ ;  $M_{\text{In-group}} = 4.84$ ,  $SD = 2.32$ ;  $F(1, 300) = .39$ ,  $p > .5$ ). Finally, in the control condition, the only (marginally) significant difference we observed was that control participants were less likely to visit the pharmacy ( $M = 4.63$ ,  $SD = 2.08$ ) than those in the crowded out-group condition ( $M = 5.26$ ,  $SD = 2.03$ ;  $t(150) = 1.9$ ,  $p = .06$ ). Note that because we observed no difference between

the crowded in-group condition ( $M = 4.47$ ,  $SD = 2.35$ ) and the control condition ( $M = 4.63$ ,  $SD = 2.08$ ;  $t(151) = -4.57$ ,  $p > .6$ ), this study provides initial evidence suggesting the possibility that the composition of the crowd can entirely attenuate the avoidance motivation invoked by a crowd of strangers.

## Discussion

In summary, when crowds are composed of in-group (vs. out-group) members, the resulting effect on safety-oriented choice is reduced. Given that in-group crowds should be innately less threatening than out-group crowds, this finding provides further support for our core theoretical premise that being crowded activates the avoidance system. Moreover, from a practical decision-making point of view, Study 3's results enable us to make more nuanced predictions regarding where the effects of crowding on choice are likely to be most material. For example, although Study 3's results suggest that a person shopping in a packed retail store is more likely to make safety-oriented choices, the data also suggest that this effect would be attenuated in the case of a person making a purchase online when crowded to a similar degree by friends and family at a social event.

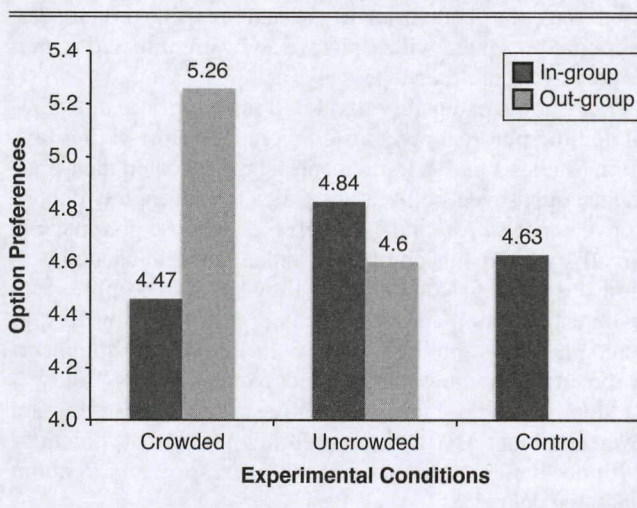
### STUDY 4: MESSAGE FRAME AND ACTUAL BEHAVIORAL CHOICE

Study 4 has two main objectives. First, recall that prior research has revealed that a prevention focus leads loss-framed messages to be more effective than gain-framed messages (Lee and Aaker 2004). As such, to generalize the main result obtained from the first four studies, we wanted to examine whether social crowdedness influences the persuasiveness of promotion-/prevention-framed messages. Second, because the previous studies relied on product ratings, we wanted to explore the effect of social crowding on actual behavior. Therefore, Study 4 explores whether being crowded (uncrowded) leads people to be more receptive to a prevention- (promotion-) framed dental health care message. Furthermore, to assess the general persuasiveness of the messages, we observed whether participants chose to floss their teeth when subsequently given the opportunity to do so.

## Method

Two hundred thirteen undergraduate students from a North American university participated in this study for payment. The study was a 2 (message frame: prevention-oriented vs. promotion-oriented)  $\times$  2 crowdedness (crowded vs. uncrowded) between-subjects design. Participants first completed a supposed snack-tasting study to ensure they would be sufficiently motivated to consider flossing later in the study. They were told that they had been invited to try a new product from a snack manufacturer so that the company could learn the opinions of potential targets. Six different snacks that easily become stuck between the teeth (e.g., caramels, dried fruits, popcorn) were provided, and the participants were instructed to taste them and answer a series of questions (regarding, e.g., texture, sweetness, saltiness). After the snack-tasting task, in an ostensibly unrelated task, participants were randomly assigned to one of two prime conditions (crowded vs. uncrowded) and were presented with the appropriate crowdedness pictures used in

Figure 5  
STUDY 3: OPTION PREFERENCES BY CONDITIONS





the pilot study and Study 2 (see Figure 1, Panels A and B). Participants were again asked to imagine themselves in the pictured scene and briefly describe how they would feel.

Participants then completed another supposedly unrelated study, a message evaluation task, which claimed to be a study on the persuasiveness of health care messages. They were presented with one of two dental health messages, both of which were described as having been developed by the association of dental hygiene to educate college students. The message in the prevention condition was framed in terms of preventing loss (i.e., mitigating a health risk: "How you can prevent gingivitis"), whereas the message in the promotion condition was framed as promoting a gain (i.e., looking better: "How you can get brighter smiles"). We adapted both from actual dental educational materials. Specifically, participants assigned to the prevention condition read the following message relating to gingivitis prevention:

Gingivitis is a serious and very common dental condition, but it is 100 percent preventable.... The condition is caused by an overgrowth of bacteria inside the mouth that converts into plaque and leads to bad breath, bleeding gums, and often sore or swollen gums.... It can cause more serious conditions such as tooth loss, periodontal disease, and even heart disease. You can easily prevent the condition ... [b]y brushing, flossing, and rinsing twice a day at home, using the correct technique.

Participants assigned to the promotion condition read the following message describing the benefits of teeth whitening:

Everyone loves a bright white smile. Fortunately, there are a variety of procedures and products available today that can improve the look of yours.... Whitening one's teeth is the process of restoring teeth to their natural color. This is done by removing the build-up and dirt collected on the tooth's surface.

After reading one of the two messages, participants rated their receptivity on five dimensions, evaluating whether the message was convincing, appealing, personally relevant, and important and whether they were willing to keep up the suggested behavior (seven-point scales; 1 = "strongly agree," and 7 = "strongly disagree"). Finally, after participants finished the message evaluation task and before they left the lab, an experimenter approached each participant and offered them a chance to floss their teeth in a separate

room where dental floss, table mirrors, napkins, spring water, and a trash bin were provided. The participants who wanted to floss their teeth were guided to the flossing room (for further information, see the Web Appendix).

### Results

**Message appeal.** We averaged the five message ratings to provide a single message receptivity score ( $\alpha = .90$ ). A two-way ANOVA with message frame (prevention vs. promotion) and crowding (crowded vs. uncrowded) as the independent variables and the message receptivity evaluation score as the dependent variable revealed a main effect of message framing, with participants in both conditions evaluating the prevention-framed message as more persuasive ( $M = 4.69$ ,  $SD = 1.28$ ) than the promotion-framed message ( $M = 4.32$ ,  $SD = 1.19$ ;  $F(1, 209) = 4.76$ ,  $p < .03$ ). However, this main effect was qualified by the predicted two-way interaction ( $F(1, 209) = 4.19$ ,  $p < .05$ ). Specifically, for participants in the crowded condition, the prevention-framed message was more persuasive ( $M = 4.98$ ,  $SD = 1.30$ ) than the promotion-framed message ( $M = 4.27$ ,  $SD = 1.08$ ;  $F(1, 209) = 9.11$ ,  $p < .003$ ). However, the simple effect of message frame was not significant in the uncrowded condition ( $M_{\text{Prevention}} = 4.40$ ,  $SD = 1.20$ ;  $M_{\text{Promotion}} = 4.37$ ,  $SD = 1.30$ ;  $p > .9$ ). Thus, the interaction was primarily driven by an increase in the persuasiveness of the prevention-framed message in the crowded condition. For full results, see Table 2.

**Behavioral choice.** Figure 6 presents choice to floss across the crowding and message frame conditions. A logistic regression analysis revealed no main effects of either crowding or message frame (both  $ps > .4$ ) but did reveal a significant interaction between them ( $\chi^2 = 5.6$ ,  $p < .01$ ). Consistent with our theorizing, crowded participants were much more likely to floss when exposed to a prevention-framed message (53.7%) than a promotion-framed message (16.4%;  $\chi^2 = 16.7$ ,  $p < .001$ ). However, the message frame did not seem to influence the decision to floss for uncrowded participants ( $M_{\text{Prevention}} = 27.5\%$ ,  $M_{\text{Promotion}} = 22.6\%$ ;  $\chi^2 = .3$ ,  $p > .5$ ).

### Discussion

The data from Study 4 build on the prior studies by extending our findings to message persuasiveness and

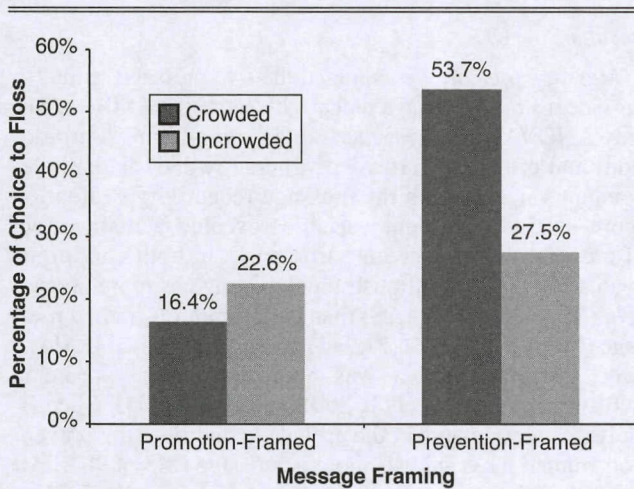
Table 2  
STUDY 4: MESSAGE RATINGS BY CONDITIONS

| Tasks                   | Framing    | Measures   | Mean Crowded Condition <sup>a</sup> |        | Mean Uncrowded Condition <sup>a</sup> |        |
|-------------------------|------------|------------|-------------------------------------|--------|---------------------------------------|--------|
| Message appeal          | Loss frame | Convincing | 5.07                                | (1.43) | 4.69                                  | (1.30) |
|                         |            | Appealing  | 4.7                                 | (1.51) | 4.14                                  | (1.36) |
|                         |            | Speaking   | 4.77                                | (1.56) | 4.0                                   | (1.40) |
|                         |            | Importance | 5.09                                | (1.59) | 4.37                                  | (1.52) |
|                         |            | Keeping up | 5.26                                | (1.63) | 4.78                                  | (1.58) |
|                         | Gain frame | Convincing | 4.42                                | (1.34) | 4.64                                  | (1.35) |
|                         |            | Appealing  | 4.33                                | (1.35) | 4.19                                  | (1.56) |
|                         |            | Speaking   | 4.05                                | (1.39) | 4.08                                  | (1.5)  |
|                         |            | Importance | 4.18                                | (1.44) | 4.28                                  | (1.60) |
|                         |            | Keeping up | 4.38                                | (1.21) | 4.68                                  | (1.45) |
| Averaged message appeal | Loss frame |            | 4.98                                | (1.30) | 4.40                                  | (1.20) |
|                         | Gain frame |            | 4.27                                | (1.08) | 4.37                                  | (1.30) |

<sup>a</sup>Items measured on seven-point scales.

Notes: Standard deviations appear in parentheses.

Figure 6  
STUDY 4: CHOICE TO FLOSS BY MESSAGE FRAME AND  
CONDITIONS



actual behavior. Not only did self-reported measures indicate that the prevention-framed dental health message was better received in the crowded condition, actual flossing activity revealed that the increased persuasive effect of the prevention-framed message in the crowded condition was sufficient to influence actual downstream health behavior.

#### STUDY 5: RISK SENSITIVITY IN AN INVESTMENT GAME

The main goal of Study 5 was to generalize our findings to risk sensitivity. Our experimental work thus far has focused on safety-oriented choices and message persuasiveness; however, if being socially crowded does precipitate an avoidant state, it should also result in sensitivity to losses in general (Florack and Hartmann 2007; Idson, Liberman, and Higgins 2000; Levine, Higgins, and Choi 2000). To explore this, in Study 5, we used a real money sequential gamble paradigm that played out over ten rounds, which enabled us to examine participants' motivation to gamble contingent on whether they won or lost in the previous round. If crowded participants are indeed more sensitive to losses than uncrowded participants, they should display a greater reticence to gamble following a loss.

#### Method

Fifty-six students at a North American university participated in this study for extra credit. The study was held in a regular classroom and conducted using a paper-and-pencil survey. As in the pilot study, Study 2, and Study 4, participants were randomly assigned to either the crowded or uncrowded condition and were presented with the crowded or uncrowded images from Figure 1, Panels A and B. As before, participants were asked to spend a few moments looking at the image and to briefly describe how they would feel if they were in it.

Next, in a supposedly unrelated task, participants were presented with a series of investment decision tasks following a paradigm used by Shiv et al. (2005). Specifically, all participants were told they had been given \$10 and

instructed to treat the money as real because there was a 50% chance that they would receive a gift card containing the amount of money they earned at the end of the study. They were told they would be making ten rounds of investment decisions and must decide whether to invest or save \$1 in each round. When they invested a dollar, the outcome of the investment was determined by the virtual tossing of a coin on a large screen in the room. If the toss landed on heads (50% chance), the participant would lose the dollar invested; if the toss landed on tails (50% chance), the participant would be rewarded with \$2.50 in his or her account. Note that this pattern of outcomes leads the expected value of gambling to be greater (\$1.25) than not gambling (\$1). Participants were further incentivized to maximize their return by being told that gift cards containing the amount won would be awarded to the 50% with the highest balances after ten rounds.

#### Results and Discussion

We first examined the overall rejection rate of the gamble across all ten rounds and found that whereas participants in the uncrowded condition kept the dollar in only 22% of the rounds on average, those in the crowded condition kept the dollar in 36% of the rounds ( $t(54) = -2.17, p < .04$ ). Thus, crowded participants were more risk averse on average. To better understand this risk aversion, we next explored whether the outcomes of the previous round (i.e., winning or losing) influenced gambling decisions differently across crowding conditions. To this end, we counted the total number of investments made following a loss or a win in the previous round. A Wilcoxon signed-rank test revealed that whereas uncrowded participants invested in 75% of the rounds immediately following a loss, only 49% of crowded participants did so ( $p < .04$ ). However, in the rounds following a win, there was no difference in the propensity to invest between the uncrowded (95%) and crowded (97%) participants.

#### Discussion

The results of Study 5 support our hypothesis that a crowding-induced avoidance motivation leads people to become more sensitive to risk cues in their environment. Over ten rounds, we observed not only that crowded participants took part in fewer expected value positive gambles but also that this reticence was primarily driven by an increased rate of rejection of the gamble in rounds immediately following a loss. This particular pattern is consistent with crowded participants being more sensitive to risk cues and, thus, overweighting prior losses when making subsequent investment decisions. Moreover, Study 5 used actual money gambles, which provides further support for the Study 4 finding that the degree of social crowdedness can moderate actual important behavioral choices.

#### GENERAL DISCUSSION

The current research identifies an important mechanism through which the crowdedness of an environment can influence consumer decisions made in that environment. Six studies combine to suggest that a higher level of social crowdedness leads people to adopt a greater prevention focus and to display a resultant shift in preference toward conservative choice options. In the pilot study, participants who imagined themselves in a crowded scene subsequently

displayed a significantly stronger prevention focus. Study 1 built on this finding by demonstrating that people in a physically crowded (vs. an uncrowded) room displayed both a greater preference for safety-oriented choice options and an increased accessibility of safety-related words. Study 2 combined the first two studies by revealing that the prevention focus evoked by imagining being in a crowded environment mediated participants' preference toward safety-oriented choice options. Study 3 demonstrated that the composition of the crowd serves as an important moderator of the core effect: we observed much stronger effects when the crowd was composed of out-group (vs. in-group) members. Study 4 served both to generalize the obtained effects to the persuasiveness of prevention-framed messages and to demonstrate the potential of social crowding to influence an actual (in this case, health-oriented) behavior. Finally, Study 5 revealed that being crowded influences risk aversion in general by showing that crowded people were much more sensitive to prior round losses in a sequential gamble paradigm.

### *Theoretical and Practical Implications*

We believe these findings add a new dimension to research on crowding, which has, to date, primarily centered on relatively narrow behavioral outcomes such as task performance or social behavior (e.g., Epstein and Karlin 1975; Evans and Lepore 1993). Similarly, consumer researchers have thus far shown only that store crowding decreases shopping satisfaction (Eroglu, Machleit, and Barr 2005), precipitates an earlier departure from a crowded store (Hui and Bateson 1991), and can threaten consumers' sense of individuality (Xu, Shen, and Wyer 2012). The current research builds on these findings by demonstrating a specific way in which an avoidance motivational state induced by social crowdedness can influence subsequent information processing and decision making.

Our research also adds to the emerging literature stream on the significant (and automatic) effects that features of the consumption environment can have on important (and often automatically determined) consumer behaviors (e.g., Chartrand et al. 2008; Dijksterhuis et al. 2005; Ferraro, Bettman, and Chartrand 2009; Mandel and Johnson 2002). More specifically, the current research joins an increasing body of work chronicling how uniquely social cues, such as behavioral mimicry (Tanner et al. 2008) or facial familiarity (Tanner and Maeng 2012), can influence consumers. In particular, Tanner and Maeng's (2012) argument that individual faces can automatically invoke approach and avoid motivations is conceptually related to our underlying proposition that crowds induce an avoidant response. In essence, both findings constitute examples of how evolutionarily adaptive outcomes of the primal approach/avoid system can materially affect the behavior of the modern consumer.

More practically, be it a physician in a ward, a trader on a trading floor, or a voter at a political rally, many risk-sensitive decisions are made in environments that can vary considerably in their crowdedness. As such, we believe our research has potentially significant implications for both marketing practitioners and public policy makers desirous of moderating specific behaviors. For example, are there particular advantages to emphasizing one set of product features over another? When is it better to promote healthy behaviors by emphasizing the benefits of adopting healthy actions, and

when is it preferable to emphasize the cost of not adopting that behavior? Our data suggest that the crowdedness of the environment in question can materially inform how we go about answering these questions. For example, in the case of the retail industry, Study 4 revealed that different message frames vary in effectiveness depending on the crowdedness of the environment. As such, in a world in which digital signage enables more sophisticated and dynamic messaging, it may be in retailers' interests to alter both their promotional strategies (e.g., which deals are highlighted) and messaging on the basis of the store's crowdedness. From a public policy perspective, our data would suggest that, for example, delivering messages about the harm of not eating vegetables (i.e., a prevention focus) would be more persuasive to shoppers in crowded stores, whereas messages focused on the benefits of eating vegetables (i.e., a promotion focus) would be more effective to shoppers in less crowded stores. Similarly, whereas a politician at a crowded rally might want to frame certain elements of his or her policy in avoidance terms, the same policy ideas might be more persuasive if presented with an approach frame when giving a television interview (for which the audience is likely to be uncrowded).

### *Further Research*

A particularly promising direction for further research would be to identify boundary conditions of the effects we present here. First, it is possible that the link between social crowding and a defensive state is not universal but culturally specific. Hall (1966) argues that the actual size of personal space varies as a function of country of origin such that people from cultures with high population density have smaller personal spaces. Thus, it is possible that the effects we observed might be attenuated or even reversed for people from highly populated areas.

Second, beyond the in-group/out-group moderation we identified, the influence of social crowding on downstream behaviors might also vary across crowd types and contexts. Specifically, emerging evidence has documented two functionally discrete threat management systems, one committed to self-protection and the other dedicated to disease avoidance (for a review, see Neuberg, Kenrick, and Schaller 2011). Although both systems bias behavior in a risk-averse manner to minimize threats to the individual, they are functionally distinct (being located in different neurobiological substrates) and are thought to engage different emotions: fear and anxiety for self-protection and disgust for disease avoidance (Cottrell and Neuberg 2005; LeDoux 1990; Oaten, Stevenson, and Case 2009). In this article, we proposed and evidenced that the mechanism underlying our data is related to the self-protection system. However, the disease avoidance threat management system may also be activated by crowding, because crowded environments are disproportionately likely to be contaminated. Given that research has also shown fear and disgust to have different cognitive consequences (Yartz and Hawk 2002), it is possible that variation in the specific type of threat that different types of crowds are perceived to represent might actually lead to very different outcomes for choice and decision making.

Third, further research could explore the degree of crowding required to invoke the effects identified here and

examine whether a relationship (linear or otherwise) exists between the size (and/or density) of the crowd and the level of avoidance response that results. Although this topic is outside the scope of the current research, we note that whereas the images we used to prime crowdedness featured a very large outdoor crowd, the natural crowdedness manipulation used in Study 1 relied on only ten people in a small room. As such, these data are indicative of the possibility that the effects we identify can occur in response to various levels of crowdedness.

Fourth, researchers might fruitfully examine other aspects of social crowding, such as the potential for unintended physical contact to occur. For example, it would be worthwhile to contrast our Study 5 finding that crowding attenuates financial risk taking with recent research demonstrating that physical contact can actually result in the opposite effect (Levav and Argo 2010). Certainly, given that a direct consequence of a more crowded environment is increased probability of physical contact, these results may initially seem to be potentially in opposition. However, consistent with emerging research identifying the differing cognitive consequences of deliberate and accidental touch (Gustafsson et al. 2013), a likely resolution could be found in the type of physical contact that occurs. Specifically, Levav and Argo (2010) examine the effect of a light, comforting pat on the shoulder, which is clearly different from the accidental jostling type of contact that can occur in socially crowded environments. Whereas the former is an accepted social expression of comfort and reassurance that invokes feelings of security (Levav and Argo 2010), the latter is unlikely to carry such positive connotations. That stated, we nonetheless find the contrast between the two interesting because it highlights a potential example of how two notionally closely related social stimuli can actually lead to different downstream consequences.

### Conclusion

Despite the knowledge that the level of social crowdedness varies significantly in domains in which people make consequential decisions, few studies have examined how being crowded might influence these decisions. Building on research suggesting that personal space violations lead to an avoidance response (e.g., Dosey and Meisels 1969; McDowell 1972), this article reveals that being crowded leads to increased preference for safety-oriented products as well as to a reduced tolerance for risk in general. Therefore, this research contributes to an increasing body of work suggesting that environmental cues in general, and social cues in particular, can significantly influence downstream consumer behavior.

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