Journal of Health Communication: International Perspectives

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/uhcm20

Moving Toward a Theory of Normative Influences: How Perceived Benefits and Similarity Moderate the Impact of Descriptive Norms on Behaviors

Rajiv N. Rimal, Maria K. Lapinski, Rachel J. Cook & Kevin Real

a Johns Hopkins University, Baltimore, Maryland, USA
b Michigan State University, East Lansing, Michigan, USA
c University of Kentucky, Lexington, Kentucky, USA

Published online: 23 Feb 2007.

To cite this article: Rajiv N. Rimal, Maria K. Lapinski, Rachel J. Cook & Kevin Real (2005) Moving Toward a Theory of Normative Influences: How Perceived Benefits and Similarity Moderate the Impact of Descriptive Norms on Behaviors, Journal of Health Communication: International Perspectives, 10:5, 433-450, DOI: 10.1080/10810730591009880

To link to this article: http://dx.doi.org/10.1080/10810730591009880

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the “Content”) contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms &
Moving Toward a Theory of Normative Influences: How Perceived Benefits and Similarity Moderate the Impact of Descriptive Norms on Behaviors

RAJIV N. RIMAL
Johns Hopkins University, Baltimore, Maryland, USA

MARIA K. LAPINSKI
Michigan State University, East Lansing, Michigan, USA

RACHEL J. COOK
Johns Hopkins University, Baltimore, Maryland, USA

KEVIN REAL
University of Kentucky, Lexington, Kentucky, USA

In recent years researchers have focused attention on understanding the role of normative factors in influencing behaviors. Although there is some evidence to support the idea that restructuring normative beliefs can result in behavior change, the norms literature is largely silent about how or why this influence occurs. The theory of normative social behavior describes the moderators of the descriptive norm-behavior relationship. Through a 2 (descriptive norms: high or low) × 2 (perceived benefits: high or low) × 2 (similarity: high or low) between-subjects experiment (N = 174), we tested whether these cognitive mechanisms moderated the norms-behavior link. Results indicated that descriptive norms do not exert a direct influence on behavior. Rather, perceived benefits moderated the relationship between descriptive norms and behavioral intention and perceived similarity moderated the relation between descriptive norms and self-efficacy.

Interventions aimed at changing behaviors by reshaping people’s normative beliefs show a great deal of promise (Borsari & Carey, 2003; Haines & Spear, 1996), and these programs have gained popularity in recent years, especially in the domain of alcohol consumption on U.S. campuses (Wechsler & Kuo, 2000). These efforts are guided by the underlying belief that if individuals’ perceptions about norms can be changed, then behavior change will occur. There is some evidence to support this belief (Bator & Cialdini, 2000), but findings from research that tests the causal link between norms and behaviors are inconsistent (Bagozzi, Wong, Abe, & Bergami, 2000).

This research was conducted during the first author’s tenure at the University of Texas at Austin.

Address correspondence to Rajiv N. Rimal, Department of Health Policy & Management, Johns Hopkins University, 624 N. Broadway, Hampton House 739, Baltimore, MD 21209. E-mail: rrimal@jhsph.edu
It is the thesis of this article that this inconsistency stems from three shortcomings that prior research on norms has not addressed comprehensively.

First, there is a great deal of conceptual ambiguity surrounding the meaning of norms. Scholars have used a myriad of terms to describe this concept, including subjective norms (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), social norms (Perkins & Berkowitz, 1986; Perkins, Meilman, Leichliter, Cashin, & Presley, 1999), normative influences (Cialdini, Reno, & Kallgren, 1990; Deutsch & Gerard, 1955), social influences (Rice, 1993), or simply norms (Bendor & Swistak, 2001). It is our view that the use of these terms masks the difference between two closely related but conceptually distinct ideas first formulated by Cialdini and colleagues (1990): descriptive norms and injunctive norms.

Following Cialdini and colleagues (1990), we conceptualize descriptive norms as persons’ perceptions about the prevalence of a behavior and injunctive norms as pressures that persons perceive from members of their reference group to enact or refrain from enacting a particular behavior. Whereas descriptive norms provide information about what is normal, what most people do, injunctive norms provide information about what ought to be done. It is usually the case that descriptive and injunctive norms are mutually congruent; after all, by observing what most people do in a given social setting, individuals perceive, often correctly, that they themselves are required to do the same. For example, upon walking into a meeting, an individual may observe that most others are quiet and attentive (the descriptive norm), and hence he or she may perceive, correctly, that transgressions of this norm will result in some social sanction (injunctive norm). It is not surprising that, in similar situations, many individuals will follow what they perceive to be the appropriate group norm. The principle of social proof (Cialdini, 1993) posits, for example, that it is usually in the individual’s interest to follow group norms because doing so often is beneficial for the individual’s survival. There are many situations, however, when individuals defy strong descriptive or injunctive norms. These situations provide us with an opportunity to understand the underlying cognitive processes.

The second shortcoming of the norms literature is that little attention has been focused on explicating the underlying cognitive mechanisms of the relation between perceived norms and behavior. Thus, we have a limited understanding as to why norms work, when they do, in influencing behaviors. Normative influences may operate in much the same way as conformity processes (Asch, 1952) or they may include a rational, cognitive component (Ajzen & Fishbein, 1980). The processes that underlie the influence of norms remain unspecified, and thus the implication of the balance of norms-based findings—that humans are guided primarily by what others do—seems to be at odds with much of the research on human motivation and learning. That literature makes a strong case for the role of peer modeling, outcome expectations, and self-efficacy to exercise restraint (Bandura, 1977, 1986, 1989).

The third shortcoming of the norms literature is the failure by many researchers to make distinctions among various attributes that define behaviors in general and health behaviors in particular. In other words, with regard to normative influences, not all behaviors are created equal (Bagozzi et al., 2000; Lapinski & Rimal, 2005). Some behaviors, for example, are enacted in personal, private settings, whereas other behaviors are enacted under the public eye. It seems logical that, compared with the first, the second category of behaviors would be more strongly influenced by norms.
Bagozzi and colleagues (2000) found, for example, that for eating behaviors, the influence of norms is moderated by the setting in which the behavior takes place. Getting tested for HIV is a behavior that takes place in a private as opposed to a public setting (Lapinski, Randall, & Pope, 2000); anonymity is likely to be a powerful attribute that governs this behavior, and thus perceptions about the prevalence of this behavior among one’s social network are likely to be less influential. College students’ alcohol consumption, on the other hand, is a behavior enacted in social settings (Cowan & Mosher, 1986; Haines & Spear, 1996; Perkins et al., 1999; Wechsler & Kuo, 2000) in which perceptions about others’ behaviors are important (Perkins & Berkowitz, 1986; Wechsler & Kuo, 2000). Hence, unless we delineate key behavioral attributes, we cannot clearly generalize the findings of empirical studies across health behaviors.

In this article, we address each of the three shortcomings mentioned above. First, our concern is limited to understanding the influence of descriptive norms, and we do not work with the assumption that descriptive and injunctive norms are isomorphic, or that implications from our study pertain to injunctive norms. We chose to focus on descriptive norms for two reasons. First, in this initial study in order to establish a causal link between normative influences and behaviors, we sought to manipulate norms rather than study them through a correlation design, and we believed that perceptions of descriptive norms would be manipulated more easily than injunctive norms. The second reason for focusing on descriptive norms is more pragmatic. Because many norms-based, antialcohol interventions currently underway on U.S. campuses focus on descriptive norms by restructuring students’ perceptions about the prevalence of consumption in their social midst (Haines & Spear, 1996; Perkins et al., 1999; Wechsler & Kuo, 2000), we deemed it important to understand how this influence occurs.

Addressing the second shortcoming—to delineate the underlying cognitive mechanisms—of the extant norms literature is the primary focus of this article (we will discuss the third shortcoming—identifying behavioral attributes—shortly). By “cognitive mechanisms,” we are referring to the underlying processes that govern how descriptive norms influence behavior. In prior work (Lapinski & Rimal, 2005; Rimal & Real, 2003), we have identified four such factors: outcome expectations (including perceived benefits to oneself, benefits to others, and anticipatory socialization), group identity (comprising similarity and aspiration), ego involvement (the extent to which enactment of a behavior is tied to self-concept), and injunctive norms (perceived approval from others). In the proposed model, shown in Figure 1, each cognitive mechanism is hypothesized to moderate the relation between descriptive norms and behavioral intention. For example, “benefits to oneself,” one of the mechanisms, refers to individuals’ beliefs about the benefits that are likely to accrue if they engage in the behavior. It is hypothesized to influence the relation between descriptive norms and behavior in a multiplicative way such that, when descriptive norms are strong, those who believe the behavior results in many personal benefits will engage in the behavior more frequently. Conversely, if individuals believe that most others refrain from an activity (i.e., the descriptive norms are weak) and perceived benefits are few, individuals will be less likely to engage in the behavior. Put another way, the influence of descriptive norms on behavior must be evaluated in terms of individuals’ perceptions about whether the behavior is likely to be beneficial to them.

The other cognitive mechanisms are hypothesized to exert their influence in a similar manner. Perceived similarity, for example, also is thought to affect
the relationship between descriptive norms and behavior such that, if most others engaging in a behavior are perceived to be similar, persons are more likely to engage in the behavior themselves.

The extent to which individuals perceive similarity with referent others who comprise their social group is a key indicator of their identification with the group (Tajfel & Turner, 1986). When they perceive that others are similar to themselves, individuals are likely to experience greater levels of personal identification, which in turn makes them more susceptible to others’ influences, as has been long noted by social science (e.g., Hovland, Janis, & Kelley, 1953; Simons, Berkowitz, & Moyer, 1970) and rhetoric (Burke, 1950) scholars. When individuals believe that the prevalence of a behavior is high among their referent others and they also perceive greater similarity with them, they are likely to engage in the behaviors themselves. On the other hand, when perceived similarity is low, behaviors of others should make little impact in their own behaviors. In fact, if individuals perceive a great deal of dissimilarity, it is likely that the behaviors of the dissimilar others will be associated negatively with their own behaviors. Conceptual discussions of the other cognitive mechanisms (i.e., aspiration, benefits to others, anticipatory socialization, and social approval) are beyond the scope of this article. We refer the reader to previously published work on this issue (Lapinski & Rimal, 2005; Rimal & Real, 2003).

In our previous work, we tested the efficacy of the proposed model in two studies that sought to predict college students’ alcohol consumption. The first study (Rimal & Real, 2003) used retrospective consumption measures and the second study (Rimal & Real, 2005) used intentions to consume alcohol in the future as the dependent variables; the cognitive mechanisms, together with measures of descriptive norms (and some control variables), were able to account for 53% and 63% of the variance in consumption, respectively. Both studies, however, were based on cross-sectional data, which undermined our ability to make causal statements about the influence of descriptive norms on behaviors.

This article presents a direct test of a component of the theory of normative social behavior (TNSB; Rimal & Real, 2005) by manipulating descriptive norms

![Figure 1. Cognitive mechanisms in the theory of normative social behavior as the moderators of the influence of descriptive norms on behaviors.](image-url)
and two of the cognitive mechanisms (benefits and similarity) in order to determine whether the moderating role played by the cognitive mechanisms can be established through a more rigorous test of causality. Of the variables identified by Rimal and Real as moderators of the relation between descriptive norms and behavior, we chose perceived benefits and similarity because these were thought to be most conducive to an experimental manipulation. Thus, our study hypotheses follow:

H1: The influence of descriptive norms on behavior will be moderated by perceived benefits such that the interaction between descriptive norms and perceived benefits will be significantly associated with behavioral intentions and with self-efficacy.

H2: The influence of descriptive norms on behavior will be moderated by similarity such that the interaction between descriptive norms and similarity will be significantly associated with behavioral intentions and with self-efficacy.

The specific behavior under investigation in this paper is the practice of yoga. We chose this behavior mainly for two reasons. First, given this initial study that seeks to manipulate descriptive norms, perceived benefits, and similarity, it was important for us to choose a behavior about which students, the participants in this study, had little prior knowledge. Research shows that normative influences are heightened under conditions of ambiguity (Cialdini, 1993), which is more likely to occur if prior knowledge about the topic is low. Thus, one of the reasons for choosing the practice of yoga was our belief that, in order to study normative influences, the primary behavioral attribute of interest is ambiguity surrounding the behavior. We will return to this point later in the discussion section of this article.

Second, we sought a behavior that could generate a sufficient amount of interest among students. Given the rising interest in alternative health practices in the United States (Anonymous, 2001), yoga as a topic was deemed to provide a good balance between low prior knowledge, on the one hand, and likelihood of arousing curiosity, on the other. In this study, the two primary outcomes of interest were behavioral intentions and self-efficacy to practice yoga. Both of these variables were chosen because they are reasonable proxies for actual behavior (Ajzen & Fishbein, 1980; Rimal, 2000). Further, because of the potential effects of self-efficacy on behavioral intention, models that tested the impact of the experimental manipulations on behavioral intention used self-efficacy as a covariate. We used Bandura’s (1977, 1986) definition of self-efficacy: individuals’ perceptions about their abilities to exert personal control.

Method

Design

To test our overall hypothesis that the effects of descriptive norms on behaviors would be moderated by perceived benefits and similarity, we conducted a 2 (high/low prevalence) × 2 (high/low benefits) × 2 (similarity/dissimilar actor) between-subjects experiment. Participants were exposed to three kinds of information about yoga: either that the practice was highly popular or not popular; either that practitioners of yoga were similar or dissimilar to the participants; and either that the
benefits of yoga were many or few. Participants then answered questions about their behavioral intentions and self-efficacy to practice yoga.

Participants

Participants for this study comprised students \((N = 174)\) who were recruited from a participant pool maintained in the Department of Communication Studies at a large public university in the Southwest. Students were offered extra course credit for their participation. The sample comprised 80% females and 75% upper-division undergraduates. Approximately 68% of the participants self-reported their race as White, 14% Asian, 9% Hispanic, 5% African American, and 4% “other.” The average age was 21.7 years \((SD = 2.8)\). Because the primary outcomes of interest—behavioral intention and self-efficacy—involved asking participants their intentions and confidence to begin yoga, we excluded from our data analyses participants \((n = 13, 7.5\%)\) who already were engaging in this behavior. A chi-square test between exclusion from this study and assignment to one of the eight experimental conditions \([\chi^2(7, N = 173) = 10.2, p > .10]\) was not significant. Thus, our exclusion of prior yoga participants seems not related to the assignment to experimental condition.

Procedure

An on-line study was designed to manipulate each of our independent variables through separate web pages. Students received information about the study from their course instructor, and were given an Internet address to begin the study on-line. Students were free to participate in the study from any location with on-line access. Because this study was not conducted in a tightly controlled laboratory setting, we were conscious of potential threats to the internal validity of our design. This was a relatively minor concern for two reasons. First, the manipulations of the independent variables (discussed subsequently) seemed to have been successful. Second, the attempt in this study was to simulate a real-world situation in which students receive much of their health information from on-line sources (McDowell, 2002). Thus, although our internal validity was compromised because of an absence of tighter controls that would have been possible in a laboratory setting, we believe our external validity was enhanced significantly by allowing students to complete the study in a location of convenience to them.

When participants logged on to the study website, the first screen presented the informed consent form (approved by the Institutional Review Board where the study was conducted), and participants consented by clicking the “submit” button at the bottom of the screen. On the next screen, participants were told that students from a local high school had been assigned to design a website that promoted healthy activities. Participants were asked to evaluate this website according to five criteria: thoroughness of the research, aesthetic appeal of the web pages, ease of use, web designers’ understanding of the target audience, and use of appropriate language. Asking participants to use these criteria in their evaluation was a way to ensure that they paid sufficient attention to the content.

After reading this page, participants clicked on the “submit” button and experienced a 5-second delay during which time, they were told, the computer was randomly selecting a particular topic for their review. In reality, all participants were provided the same topic (yoga). A random number generator embedded within
the HTML program then assigned the participant to one of the two (high or low) descriptive norms conditions. At the bottom of the screen, participants were asked to write their critique of this web page. Upon hitting the “submit” button, participants then saw one of the two (high or low) similarity conditions (also chosen at random through a random-number generator), and they were again asked to provide a written feedback about this page. When they hit the “submit” button, they were then shown one of the two (high or low) benefits conditions and they were again asked to provide written feedback. After all three pages were evaluated in this manner, participants were then presented a screen that asked for their overall evaluations. This screen was used to obtain measures of our dependent variables. All outcome measures and induction checks were obtained after participants were exposed to all three inductions.

When this section of the experiment was completed, participants were debriefed about the true intent of the study, informed that the content on the websites was fictitious, and provided information about the necessity for deception. It was not possible for participants to skip the debriefing page because it contained information they were required to provide in order to record their participation for extra course credit.

**Inductions**

*Descriptive Norms.* The website for the high descriptive norms condition noted that the practice of yoga had been on the rise in the last 10 years and that now, more than ever, many people in the United States were practicing yoga. A graph at the center of the screen prominently showed an increase in yoga. In the low descriptive norms condition, all information was identical, except that “Yoga on the Rise” title was replaced by “Yoga on the Decline” title. The graph showed a decrease in the practice of yoga over the years, and participants were told that fewer people were practicing yoga today, compared with a decade ago.

*Similarity.* The website for the high similarity condition contained information indicating that college students were the most common yoga practitioners. Participants were provided information such as “college students represent the largest single group of yoga enthusiasts.” In the low similarity condition, participants were told that the most common yoga enthusiasts were pregnant women. All information was identical in the two conditions, except that “college students” in the high similarity condition was replaced by “pregnant women” in the low similarity condition.

*Perceived Benefits.* The website for the high benefits condition contained information about how the practice of yoga provided the body with many benefits. Outcomes such as relaxation, muscular strength and flexibility, and weight loss were listed as benefits. In the low benefits condition, the website contained information about how yoga provided the body with few benefits. Participants were told that yoga only extends the average life span by 3 days, and that achieving benefits from yoga took a long-term commitment with few, if any, positive results.

**Measures**

*Behavioral Intention.* Behavioral intention was conceptualized as participants’ intention to initiate the practice of yoga in the near future. Participants expressed
their level of agreement (on a 7-point Likert scale) to four statements (e.g., “I intend to take up yoga in the next week or so” and “I can see myself practicing yoga on a regular basis”). Behavioral intention was calculated as the average of the responses, $\bar{x} = .93$. The resulting variable was skewed positively (skewness = 1.58), and hence it was transformed logarithmically to approximate a normal distribution (skewness of transformed variable = .82). It should be noted that the logarithmic transformation reduced the skewness considerably but still resulted in a positively skewed distribution, indicating that intention to practice yoga was quite low in our sample. We will return to the implications of this finding later in the article. This transformed variable was used in our analyses.

**Self-efficacy.** Self-efficacy was conceptualized as the extent to which participants felt confident in their ability to practice yoga on a regular basis. This was measured through three questions that asked about (a) participants’ confidence in their ability to spend about 20 minutes each day practicing yoga, (b) their confidence in their ability to set aside time every day for practicing yoga, and (c) the extent to which practicing yoga on a daily basis would be difficult (reverse coded). Responses were measured on a 7-point Likert scale. Self-efficacy was calculated as the average of the responses, $\bar{x} = .77$. The resulting variable was skewed positively (skewness = .36) and hence it was transformed. The optimal transformation was obtained by raising it to the power of 2/5 to approximate a normal distribution (skewness of transformed variable = .001). This transformed variable was used in the analyses.

**Induction Checks**

**Descriptive Norms.** We conceptualized descriptive norms as participants’ perceptions about the prevalence of the practice of yoga. As checks on our induction of this variable, participants were asked how much they agreed with three statements about the rising popularity of yoga (e.g., “According to the websites, yoga practice is on the rise in the general population”). Responses were measured on a 7-point Likert scale. Perceived descriptive norms were calculated as the average of the three responses, $\bar{x} = .91$. A $t$ test revealed that those in the high descriptive norms condition perceived greater levels of prevalence ($M = 5.7$, $SD = 1.2$) than those in the low descriptive norms condition ($M = 1.9$, $SD = 1.3$, $t = 18.8$, $p < .0001$).

**Similarity.** Similarity was operationalized as the degree to which participants identified with other practitioners of yoga. One question asked about the extent to which they identified personally with people who practiced yoga the most and another question asked about the extent to which they believed practitioners of yoga were similar to themselves. Responses to these two questions, measured on a 7-point Likert scale, were averaged into an index, $r = .64$. A $t$ test revealed that those in the high similarity condition perceived other practitioners of yoga to be more similar to themselves ($M = 4.5$, $SD = 1.7$), compared with those in the low-similarity condition ($M = 2.7$, $SD = 1.2$, $t = 7.84$, $p < .0001$).

**Perceived Benefits.** Perceived benefits were measured through three items: the extent to which yoga provides few, if any, benefits (reverse coded); that yoga provides the body with numerous health benefits; and that practicing yoga increases a person’s life span by a significant amount. Responses, measured on 7-point Likert
scales, were averaged into an index, $\alpha = .91$. $T$ tests revealed that those in the high-benefits condition perceived greater benefits ($M = 6.3, SD = .91$) than those in the low-benefits condition ($M = 2.2, SD = 1.4, t = 22.5, p < .0001$).

**Results**

**Preliminary Analyses**

Female students ($M = 2.0, SD = 1.3, n = 123$), compared with male students ($M = 1.5, SD = .82, n = 34$), expressed greater intentions to practice yoga ($t = 2.11, p <.05$). Male and female students did not significantly differ in their self-efficacy ($t = 1.68, p > .05$). Given the difference in behavioral intention based on gender, our statistical analyses to test the study hypotheses used sex as a covariate in models that used behavioral intention as the dependent variable.

**Hypothesis 1**

Our first hypothesis predicted a significant descriptive norms × perceived benefits interaction effect. We tested this hypothesis on two dependent variables—behavioral intention and self-efficacy. To test the effects on behavioral intention, we conducted an analysis of covariance model (with gender and self-efficacy as the covariates); predictors in the model were the two experimental manipulations: descriptive norms and perceived benefits. The overall model was significant, $F(5, 151) = 15.96, p < .001, \eta^2 = .35$. The gender covariate was significant, $F(1, 151) = 11.2, p < .001$. Neither the descriptive norms main effect, $F(1, 151) = .07, p > .05$, nor the perceived benefits main effect, $F(1, 151) = .01, p > .05$, was significantly related with behavioral intention. The descriptive norm × perceived benefits interaction term, however, was significant, $F(1, 151) = 5.52, p < .05, \eta^2 = .04$. Means are shown in Table 1, and they are graphically depicted in Figure 2.

Post hoc tests revealed that, when the descriptive norm was low, perceived benefits were not significantly related to behavioral intention ($M_1 = .24, SD_1 = .25; M_2 = .16, SD_2 = .23; t = 1.5, p > .05$), but when the descriptive norm was high, perceived benefits were significantly related to behavioral intention such that lower perceived benefits ($M_3 = .15, SD_3 = .21$) resulted in weaker behavioral intentions ($t = 2.3, p < .05$), compared with higher perceived benefits ($M_4 = .27, SD_4 = .25$). Similarly, when perceived benefits were low, the descriptive norm was not related to behavioral intention ($t = 1.7, p > .05$). When perceived benefits were high, however, higher descriptive norms, compared with lower descriptive norms, resulted in stronger behavioral intention ($t = 2.3, p < .05$).

The first hypothesis was also tested for self-efficacy as the dependent variable in an analysis of variance model. The overall model was not significant, $F(3, 156) = .72, p > .05, \eta^2 = .01$. Neither of the two predictors was related significantly with self-efficacy. The descriptive norms × perceived benefits interaction term was not significant, $F(1,156) = .53, p > .05$. Hence, the data were consistent with our first hypothesis for behavioral intention but not for self-efficacy.

**Hypothesis 2**

Our second hypothesis predicted a significant descriptive norms × similarity interaction effect on behavioral intention. ANCOVA was used to test this hypothesis; the
## Table 1. Effects of experimental manipulations on behavioral intentions and self-efficacy

<table>
<thead>
<tr>
<th>Experimental condition</th>
<th>Behavioral intention</th>
<th>Self-efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>$M$</td>
</tr>
<tr>
<td>Effects of descriptive norms and benefits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$DN = \text{low}$, $\text{benefits} = \text{low}$</td>
<td>37</td>
<td>.24</td>
</tr>
<tr>
<td>$DN = \text{low}$, $\text{benefits} = \text{high}$</td>
<td>39</td>
<td>.16</td>
</tr>
<tr>
<td>$DN = \text{high}$, $\text{benefits} = \text{low}$</td>
<td>41</td>
<td>.15</td>
</tr>
<tr>
<td>$DN = \text{high}$, $\text{benefits} = \text{high}$</td>
<td>42</td>
<td>.27</td>
</tr>
<tr>
<td>Effects of descriptive norms and similarity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$DN = \text{low}$, $\text{similarity} = \text{low}$</td>
<td>35</td>
<td>.15</td>
</tr>
<tr>
<td>$DN = \text{low}$, $\text{similarity} = \text{high}$</td>
<td>41</td>
<td>.23</td>
</tr>
<tr>
<td>$DN = \text{high}$, $\text{similarity} = \text{low}$</td>
<td>44</td>
<td>.22</td>
</tr>
<tr>
<td>$DN = \text{high}$, $\text{similarity} = \text{high}$</td>
<td>39</td>
<td>.19</td>
</tr>
</tbody>
</table>

**Notes.** $DN = \text{descriptive norms}$, $B = \text{perceived benefits}$, $S = \text{similarity}$. $^a$Test of descriptive norms’ main effect. $^b$Test of the main effect of either perceived benefits or similarity. $^c$Test of the descriptive norms multiplied by the perceived benefits (or similarity) interaction effect.

$p < .05$, $**p < .01$. 

Downloaded by [Michigan State University] at 06:13 28 February 2014
The predictors were descriptive norms, similarity (as opposed to perceived benefits in hypothesis 1), and their interaction term. The overall model was significant, \( F(5, 151) = 14.49, p < .001, \eta^2 = .32 \). Although females expressed greater intentions to practice yoga than males \( F(1, 151) = 12.34, p < .001 \), and self-efficacy was a significant covariate, \( F(1, 151) = 62.65, p < .001 \), neither of the two main effects was significant. The descriptive norms × similarity interaction term was also not significant, \( F(1, 151) = .05, p > .05 \).

The second test of the second hypothesis was identical to the above test, except that biological sex was not used as a covariate, and self-efficacy was used as the dependent variable. The overall model was significant, \( F(3, 156) = 4.20, p < .01, \eta^2 = .08 \). The descriptive norms main effect was not significant, \( F(1, 156) = .90, p > .05 \); the similarity main effect was not significant, \( F(1, 156) = .06, p > .05 \). There was, however, a significant descriptive norms × similarity interaction effect, \( F(1, 156) = 11.55, p < .001, \eta^2 = .07 \), as shown in Figure 3.

Post hoc tests revealed that, when descriptive norms were low, greater similarity resulted in significantly stronger self-efficacy (\( M_2 = 1.61, SD_2 = .38 \)), compared with lower similarity (\( M_1 = 1.43, SD_1 = .34; t = 2.2, p < .05 \)). When descriptive norms

---

**Figure 2.** Effects of descriptive norms and perceived benefits on behavioral intentions.

**Figure 3.** Effects of descriptive norms and perceived similarity on self-efficacy.
were high, lower similarity resulted in significantly stronger self-efficacy ($M_3 = 1.68, SD_3 = .36$), compared with higher similarity ($M_4 = 1.47, SD_4 = .35$; $t = 2.7, p < .01$). When similarity was low, higher descriptive norms resulted in significantly stronger self-efficacy, compared with lower descriptive norms ($t = 3.1, p < .01$), but lower and higher descriptive norms were not differentially related to self-efficacy when similarity was high ($t = 1.7, p > .05$).

Thus the data were not consistent with our hypotheses for behavioral intentions, but were consistent with our predictions for self-efficacy.

**Discussion**

Prior research from the theory of normative social behavior (Rimal & Real, 2003, 2005) found that the influence of descriptive norms on behaviors is better understood by incorporating the moderating role of various cognitive mechanisms. These findings have come from correlational data, however, and the implied causal relationship has yet to be tested. The primary objective of this study was to address a number of shortcomings in the norms literature and to examine whether, by manipulating descriptive norms and two cognitive mechanisms, we would find results consistent with previous research (Rimal & Real, 2003). Results reported in this article indicate that the moderating role of the two cognitive mechanisms needs to be specified more precisely. We found that perceived benefits moderate the relationship between descriptive norm and behavioral intention (but not self-efficacy), whereas similarity moderates the relationship between descriptive norm and self-efficacy (but not behavioral intention).

**Effects on Behavioral Intention**

The different ways in which the two cognitive mechanisms exerted their influence needs further elaboration. Not surprisingly, when participants believed that there were many benefits to practicing yoga, the descriptive norm was related positively to behavioral intention. That is, the combination of the belief that many others were engaging in a behavior and that benefits associated with the behavior were high resulted in participants expressing a strong desire to engage in the behavior themselves. This finding likely relates to participants’ desires not to deprive themselves of important benefits that they believed many others were deriving from the behavior. Research indicates that the threat of a potential loss of opportunity looms large in people’s minds. Others have shown (Kahneman, Knetsch, & Thaler, 1991; Kahneman, Slovic, & Tversky, 1982), for example, that the threat of losing something is a greater motivator of action than the potential for gaining something of equal value. That is, individuals take risks in order to avoid missing out on something they perceive others value. It is possible that, when both descriptive norms and perceived benefits were substantial, individuals’ behavioral intentions were strong because of their desires to avail themselves of potential benefits that, apparently, many others were deriving from the behavior.

When individuals perceived that engaging in the behavior conferred few benefits, descriptive norms did not differentially impact behavioral intention. It thus appears that, in the absence of significant benefits associated with a behavior, information about whether most or few others are engaging in the behavior does not influence individuals’ intentions to engage in the behavior themselves. It is likely that when individuals encounter information that requires a change in their current behavior,
they first will perform mental calculations about the benefits and costs of change, as is suggested by subjective utility theory (Sutton, 1982). Because change inevitably is associated with costs (e.g., enhanced effort), few motivations exist to change if there are few benefits to be derived. Under these conditions, it appears that information about the widespread prevalence of the behavior is not sufficient to motivate change. In other words, descriptive norms, by themselves, do not deliver sufficient incentives for change when perceived benefits of the change are low.

We found that perceived benefits were positively associated with behavioral intention when descriptive norms were high, but not when descriptive norms were low. Thus, when individuals believe that few others are engaging in a behavior, whether the behavior confers many or few benefits seems not to matter in deciding whether to engage in the behavior. Perhaps information about the low prevalence of the behavior is used to infer that benefits associated with the behavior must be low; otherwise, surely many others would have engaged in the behavior. When prevalence and benefits are both high, however, there likely exists a tremendous amount of pressure to engage in the behavior—not only is the behavior beneficial, but many others are deriving benefits from it. When many others are engaging in a behavior that, apparently, is associated with few benefits, there likely exists pressure not to engage in the behavior. It is likely that, under these circumstances, individuals interpret others’ behaviors negatively—as if the others are not aware of the futility of their actions.

These results are based on an experiment in which perceived benefits were manipulated successfully—those in the high-benefit condition, relative to those in the low-benefit condition, believed that practicing yoga provided more benefits. We suspect that this manipulation was successful because few participants had extensive prior knowledge about the benefits of yoga, and when the researchers told them about the benefits, they were likely to believe it. The generalizability of this finding is likely limited because the perceived benefits surrounding many of the behaviors that health campaigns seek to change (e.g., alcohol consumption, smoking) are already deeply engrained, and changing these perceptions is difficult. It should be noted, however, that if the perceived benefits are already deeply engrained, health campaigns can still take advantage of these results by segmenting the audience according to their perceptions about the benefits. At a minimum, the findings presented here suggest that individuals’ perceptions about the benefits associated with a behavior determine what they will do with information about the prevalence of the behavior. Hence, different messages could be tailored to different people, according to the perceived benefits they attribute to or expect to derive from the behavior.

It is also noted that participants’ perceived similarity with referent others did not moderate the influence of descriptive norms on behavioral intention. Decisions to engage in or refrain from a behavior were not contingent upon how widespread the behavior was or who was engaging in the behavior. The combination of these two variables, however, was important in imparting information about one’s efficacy, a topic we turn to next.

**Effects on Self-Efficacy**

These data revealed that, when practitioners of yoga were cast as dissimilar others, prevalence of the behavior was positively related to participants’ self-efficacy to engage in the behavior themselves. When practitioners of yoga were cast as similar
others, however, prevalence of the behavior did not differentially impact self-efficacy. Further, when prevalence of the behavior was low, similarity was positively related to self-efficacy, but when prevalence was high, similarity was negatively associated with self-efficacy. We interpret this finding in the context of our operationalization of similarity: In this study, other students were perceived as similar, whereas pregnant women were perceived as dissimilar. This raises a question about the dimension on which participants evaluated their similarity relative to other students and pregnant women. We suspect that pregnant women were perceived to be dissimilar because they were thought to be physically less able than the average student to engage in a strenuous activity like yoga. Hence, when participants were told that lots of pregnant women were engaging in the activity, they likely concluded that, if so many less physically able individuals could do the behavior, then they themselves could, too. Conversely, when lots of other students were engaging in the behavior, the activity likely appeared less spectacular.

It also is interesting to note that descriptive norms were significantly associated with self-efficacy only when similarity was low, not when it was high. This indicates that cues about the popularity of a behavior are not, in and of themselves, sufficient to increase individuals' self-efficacy. Rather, persons use both popularity and similarity cues in assessing their own abilities. The explanations we have provided here are, of course, speculative, but they do raise important research questions for further exploration. At a minimum, they point to the need to be sensitive about the particular dimension along which receivers of health information are likely to evaluate their similarity relative to actors they observe.

The Use of Descriptive Norms in Health Promotion

In terms of its potential application to norms-based health interventions, perhaps the most noteworthy finding of this study is our failure to detect any descriptive norm main effect. Neither behavioral intention nor self-efficacy was directly influenced by participants’ perceptions about the prevalence of the behavior. This finding, if generalizable to other behaviors, suggests that interventions that seek to change behaviors by only restructuring individuals’ perceptions about the prevalence of the behavior—without concomitantly considering the role of other moderating factors—are unlikely to be successful. Yet, numerous interventions are currently underway on U.S. campuses (Berkowitz, 2005; Perkins et al., 1999) that are based on the logic that students’ alcohol consumption can be reduced if their exaggerated misperceptions are corrected. As we noted earlier, there is no theoretical reason to believe that individuals’ behaviors are guided solely by what others do. To subscribe to this belief is to neglect the vast literature on human learning and behavior change, including findings from social cognitive theory (Bandura, 1977, 1986) or the theory of reasoned action (Ajzen & Fishbein, 1980) that posit that humans make decisions based on their self-efficacy and outcome expectations, among other things.

This study also illustrates the need to be specific about the outcomes that health promotion campaigns seek to attain through their efforts. We found that the predictors of self-efficacy and behavioral intentions were not the same. Even though self-efficacy has been found to be a strong predictor of behavior change (Bandura, 1977, 1986, 1989), it appears that the determinants of each of these outcomes, especially when they are evaluated according to normative influences, are different. We also conclude that, consistent with social cognitive theory (Bandura, 1977, 1986),
similarity cues were more important in determining self-efficacy than they were in determining behavioral intention. Bandura (1977) notes that one of the sources of people's efficacy beliefs is vicarious learning and that vicarious learning is facilitated when role models possess characteristics similar to the audience's. Our findings seem to suggest that dissimilarity also can promote efficacy enhancement, particularly if the behavior is perceived to be enacted by many others.

Health promotion efforts usually conceptualize similarity according to readily apparent characteristics of the actors, including their physical appearance, gender, age, and so on. Persuasion researchers often discuss similarity cues in terms of attitudinal similarity (e.g., Byrne, 1971; Newcomb, 1953). In our study, we provided no such cues about the actors, who were described only as either students or pregnant women. Participants in our study were free to conjure up their own criteria to judge whether the actors were similar or dissimilar to themselves. Although our manipulation checks did reveal that those in the high- (relative to the low-) similarity condition perceived the actors as being more similar to themselves, we do not know what frame of reference was used by participants to make this judgment. Based on our findings, we suspect that pregnant women were perceived to be dissimilar in terms of their physical abilities—that participants believed pregnant women were less able than themselves to perform yoga. If this is accurate, it appears that self-efficacy of the target audience may be enhanced by depicting the behaviors of many others who are perceived, by the target audience, to be less able than themselves. Understanding participants' point of reference for similarity cues should be an important consideration of future research and practice in this domain.

Findings from this study pertain to a behavior that, we suspect, participants did not have much prior knowledge about. Yoga was deliberately chosen because we believed that there was a lot of ambiguity surrounding its practice, and we know that normative influences are more powerful in the presence of ambiguity (Cialdini, 1993). It remains to be seen whether our findings also generalize to behaviors characterized by familiarity or those in which participants have extensive prior experience. Furthermore, it is likely that there are other behavioral attributes that also vary in terms of their susceptibility to normative influences. The study of normative influences can be enriched if we first conceptualize behaviors in terms of their constituent attributes (Lapinski & Rimal, 2005). Participants in this study, for example, were not prior practitioners of yoga, and the effects we were able to attain were small—our behavioral intention measure was positively skewed, indicating that few participants expressed strong intentions to take up the practice. Hence, prior familiarity with the behavior seems to have been an important variable in this study. Future studies on normative influences could vary prior behavior or prior behavioral familiarity to determine whether it predicts susceptibility to normative influences.

A primary limitation of this study pertains to the inability to ascertain the credibility of the descriptive norms manipulation. Although manipulation checks revealed that those in the high (or low) descriptive norms condition stated that the practice of yoga was on the rise (or decline), it is not possible to tell whether participants were responding to the manipulation itself or whether they truly believed the stated prevalence of the behavior. Given the widely reported findings that show that individuals' assessment of the prevalence of behaviors in their social midst are often inaccurate (see, for example, Suls & Green, 2003), it is suspected that outcomes reported in this study would be minimally affected by the credibility of the prevalence manipulation. This is, nevertheless, worthy of future research.
Finally, we note that, although the larger norms literature differentiates descriptive from injunctive norms (e.g., Cialdini et al., 1990), extant norms-based campaigns do not. For example, many antialcohol campaigns are based on restructuring descriptive norms, whereas antismoking campaigns are based on injunctive norms, usually operationalized as peer pressure or peer influence (Alexander, Piazza, Mekos, & Valente, 1999; Andrews, Tildesley, Hops, & Li, 2002; Sorensen, Emmons, Stoddard, Linnan, & Avrunin, 2002). It is thus not surprising that findings from these two domains are mixed—peer influence, for example, has been found to be a determinant of smoking, but not of alcohol consumption (Kropp, Lavack, & Holden, 1999). Based on these findings, we caution against reaching the theoretically uninteresting conclusion that smoking and alcohol are different behaviors. Rather, we urge those creating norms-based interventions to (a) differentiate descriptive and injunctive norms and (b) articulate the attributes that govern these two behaviors in order to make them more or less susceptible to one or both types of norms. This article is meant to be a step in that direction.

References


