

Descriptive normative beliefs and conservation behavior: The moderating roles of personal involvement and injunctive normative beliefs

SUSANNE GÖCKERITZ¹, P. WESLEY SCHULTZ^{2*}, TANIA RENDÓN², ROBERT B. CIALDINI³,
NOAH J. GOLDSTEIN⁴ AND VLADAS GRISKEVICIUS⁵

¹*Martin Luther University Halle-Wittenberg, Germany* ²*California State University, San Marcos, CA, USA*

³*Arizona State University, Arizona, USA,* ⁴*University of California, Los Angeles, USA,* ⁵*University of Minnesota, Minnesota, USA*

Abstract

There is ample evidence of the power of social influence on pro-environmental behaviors. Beliefs about the conservation behavior of others (descriptive normative beliefs) have a strong positive correlation with one's own conservation actions. However, this relationship has not been investigated much further in terms of possible moderators or involved mechanisms of information processing. The present study examines two potential moderators and draws links to underlying processing mechanisms. We hypothesized that personal involvement with conservation issues and beliefs about other's approval of conservation (injunctive normative beliefs) would moderate the relationship between descriptive normative beliefs and conservation behavior. The sample consisted of 1604 California residents that were recruited through random digit telephone dialing. Results showed that both injunctive normative beliefs and personal involvement moderated the relationship between descriptive normative beliefs and conservation behavior. High personal involvement weakened the relationship, whereas high injunctive normative beliefs strengthened it. We conclude from these findings that descriptive normative beliefs influence conservation behavior through a rather nonconscious, peripheral route of information processing, while personal involvement motivates a more elaborate, central route of information processing. Copyright # 2009 John Wiley & Sons, Ltd.

*Correspondence to: P. Wesley Schultz, Department of Psychology, California State University, San Marcos, CA 92078, USA. E-mail: wschultz@csusm.edu

This is the peer reviewed version of the following article: Göckeritz, S., Schultz, P. W., & Rendón, T., Cialdini, R. B., Goldstein, N., & Griskevicius, V. (2010). Descriptive normative beliefs and conservation behavior: The moderating role of personal involvement and injunctive normative beliefs. *European Journal of Social Psychology*, 40, 514-523. <http://dx.doi.org/10.1002/ejsp.643>., which has been published in final form at <http://dx.doi.org/10.1002/ejsp.643>. This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Self-Archiving.

“When people are free to do as they please, they usually imitate each other.” Eric Hoffer

Being social by nature, humans are highly susceptible to social influence. We regularly attend to the behavior of others around us, and we use them as a guide for our own actions. Indeed, modifying our behavior to match those around us has an adaptive element, and it can serve as a simple strategy to save cognitive resources. Over the years, a sizeable volume of social psychological research has documented the basic process of social influence and conformity (Cialdini & Trost, 1998; Schultz, Tabanico, & Rendón, 2008), and recent studies suggest that normative social influence can occur automatically, without the need for conscious elaboration (Nolan, Schultz, Cialdini, Griskevicius, & Goldstein, 2008; Pendry & Carrick, 2001). But is normative social influence really such a straightforward and unmoderated process? Does the power of our social environment always override our beliefs and values? Are we merely leaves in the wind, to be blown by the social maelstrom around us? In the current paper, we explore the relationship between descriptive normative beliefs and behavior, and demonstrate that the process of normative social influence is moderated by personal involvement in the behavioral domain and by injunctive normative beliefs.

SOCIAL NORMS

Social norms are the common and accepted behaviors for a specific situation. Our main interests as psychologists, however, are not norms *per se* but the normative beliefs that individuals hold. That is, norms reside in the head of the individual, and they can differ (often dramatically) in their degree of accuracy. In their Focus Theory of Normative Conduct, Cialdini, Reno, and Kallgren (1990) differentiate between two categories of normative beliefs. Descriptive normative beliefs, which refer to what an individual thinks others do in a particular situation, and injunctive normative beliefs, which describe what an individual thinks others approve or disapprove of. Put more simply, descriptive normative beliefs can be understood as norms of *is* and injunctive normative beliefs as norms of *ought*.

While our focus in this paper is on descriptive and injunctive normative beliefs, it is useful to position this work within the broader context of social influence. In a widely cited article, Deutsch and Gerard (1955) differentiated between informational and normative social influence. These concepts are based on different motivations for conforming to the behavior of others in a group. On the one hand, individuals conform to perceived social norms in an effort to be accepted by the group (normative social influence). And on the other hand, individuals can also use others as a guide in determining a correct course of action (informational social influence). So for example, a person might follow other passengers in an unfamiliar airport in order to find the baggage claim area (informational social influence). Alternatively, an individual might refrain from littering in the same airport for fear of social ridicule or disapproval. While injunctive normative beliefs follow quite closely the normative social influence described by Deutsch and Gerard, descriptive norms can be both normative and informational. In this paper, we view descriptive and injunctive social norms as variations of normative social influence. But while both of these normative processes are driven by a desire to be accepted by the group (or at least, not to be too deviant), they work through distinct processes.

The psychological research surrounding social norms (and especially normative beliefs) has focused on the influence that norms have on behavior. A large number of studies have shown a

strong correlation between descriptive normative beliefs and behavioral intentions, as well as actual behavior (e.g., Corral, Frías, Pérez, Orduño, & Espinoza, 2002; Dahlstrand & Biel, 1997; Garvill, 1999; Hornik, Cherian, Madansky, & Narayana, 1995). For instance, Staats, Wit, and Midden (1996) showed that the self-reported individual contributions to prevent global warming (e.g., by using public transportation instead of a car) were strongly correlated with normative beliefs about what other people did ($r = .77$). That is, believing that others frequently engaged in these environmental behaviors was positively associated with engaging in those behaviors oneself. Similar findings were also reported by Nolan et al. (2008), where descriptive normative beliefs were found to be one of the strongest predictors of an individual's decision to conserve energy in their home ($r = .45$). These findings are illustrative of a large body of research showing that normative beliefs are strongly predictive of both behavioral intentions and behavior.

In addition to the large volume of correlational findings, there are also a growing number of experimental studies (both basic and applied) that have effectively changed behavior by providing participants with normative information. Many of these studies come from applied domains, like health, safety, and environmental protection. For example, Neighbors, Lewis, and Larimer (2004) found that college students who reported binge drinking were also more likely to overestimate the amount of alcohol that their fellow students drank (i.e., the basic correlational finding described in the previous paragraph). This misperception in the descriptive normative belief of drinking behavior was addressed with a social norms intervention. Students identified as heavy drinkers were given actual normative information about the lower prevalence of alcohol consumption among students on their campus. This information was shown to change the normative beliefs of these students and also to reduce their self-reported alcohol consumption when measured 3 and 6 months after the intervention. Another example of a successful normative intervention aimed at increasing recycling behavior. Schultz (1999) used normative feedback to enhance the recycling behavior of his participants. Especially those participants with very low recycling rates at the beginning of the study recycled more after they had received information about the actual (higher) recycling behavior of other residents in their community. See also Agostinelli, Brown, and Miller (1995); Donaldson, Graham, and Hansen (1994); Donaldson, Graham, Piccinin, and Hansen (1995); Goldstein, Cialdini, and Griskevicius (2008); Perkins (2002, 2003); Perkins and Berkowitz (1986); and Schultz, Nolan, Cialdini, Goldstein, and Griskevicius (2007) for other experimental evidence.

THE NEED TO EXAMINE THE MECHANISMS OF NORMATIVE INFLUENCE

Despite the existing correlational and experimental research findings, a number of questions remain about the relationship between normative beliefs and behavior. Indeed, there are several studies that were not able to produce a change in behavior by providing descriptive normative information and several authors have been critical of the available data (Wechsler, Nelson, Lee, Seibring, Lewis, & Keeling, 2003). For instance, Clapp, Lange, Russel, Shillington, and Voas (2003) used a normative intervention to reduce alcohol consumption on a college campus. Their results showed that although descriptive normative beliefs about alcohol consumption were significantly changed through descriptive normative information, the drinking behavior was unaffected. For the self-reported behavior on alcohol consumption, there was no significant difference between students in the normative intervention group and students in the control group, indicating that there is a missing link

between descriptive normative beliefs and behavior. See also Eisenberg and Wechsler (2003).

In addition, the process of normative influence is still not well understood. Does it require conscious processing of information and elaboration, or do norms work their way to our behavior in a more subtle and nonconscious way? In describing the process of normative social influence, Cialdini (2005) put it this way: “People frequently ignore or severely underestimate the extent to which their actions in a situation are determined by the similar actions of others” (p. 158). Empirical support can be found in a study by Nolan et al. (2008), in which descriptive normative beliefs were shown to be the strongest predictor of energy conservation behavior, but were rated by the participants as the least important reason to conserve energy. Such results suggest that descriptive social norms might work outside an individual’s awareness, and as Nolan et al. (2008) showed, individuals often fail to recognize the strong social influence that became clear in the data analyses.

The purpose of the present paper is to elaborate on the relationship between descriptive normative beliefs and behavior, and to test the moderating role of personal involvement and injunctive normative beliefs.

INJUNCTIVE NORMATIVE BELIEFS AS A MODERATOR

In an effort to shed more light on the mechanisms of normative beliefs, recent studies have begun to explore moderators of the relationship between descriptive norms and behavior. For example, Rimal and Real (2005) offered a theoretical framework including several variables that are hypothesized to moderate the relationship between descriptive norms and behavior. Their arguments suggest that outcome expectations (that can also be described as perceived benefits of the behavior), group identity, and injunctive norms can regulate the influence of descriptive norms on behavior. More specifically, the relationship of descriptive norms and behavior should be stronger if outcome expectations and group identification are high, and injunctive norms indicate approval of others for the behavior in question. The moderating role of group identity has empirically been supported in prior studies showing a stronger relationship between descriptive norms and behavior for those participants with a high identification with their reference group (Rimal & Real, 2005; see also Hogg, 2003; Jetten & Spears, 1997; McAuliffe, Jetten, Hornsey, & Hogg, 2003; Terry & Hogg, 1996; van Knippenberg, 2000).

Related to this line of research, a study of college students’ drinking behavior found that injunctive norms of friends moderated the relationship between perceived prevalence of friends’ drinking (i.e., descriptive normative beliefs) and personal alcohol consumption (Lee, Geisner, Lewis, Neighbors, & Larimer, 2007). For students who had stronger social motives for drinking and who perceived their friends as approving of heavy drinking, the relationship between descriptive norms and alcohol consumption was stronger. These results provide support for the notion that the influence of descriptive normative beliefs on a specific behavior can be strengthened if there are also injunctive normative beliefs indicating that this behavior is approved and seen favorably by others. In other words, a behavior is more likely to occur if it is believed to be commonly done by others, *and also* believed to be approved by others. Cialdini, Demaine, Sagarin, Barrett, Rhoads, and Winter (2006) refer to this as an “aligned” norm effect, though there is little data directly testing the moderating role of injunctive norms.

PERSONAL INVOLVEMENT AS A MODERATOR

A second potential moderator is personal involvement. The concept of personal involvement has been used in several research traditions, and with various definitions and measurement approaches. In the current study, we drew on the theoretical work relating to attitudes and attitude strength. From this perspective, “individuals ... [are] personally involved with an issue, event, object, or person to the extent that they care about that entity and perceive it as important” (Thomsen, Borgida, & Lavine, 1995, p. 191). Attitudes themselves can be personally involving, which has several important consequences (Johnson & Eagly, 1989). First of all, personally involving attitudes show higher resistance and are therefore harder to change and more stable over time. Furthermore, attitudes with high personal involvement increase a person’s motivation to process persuasive messages. This finding is consistent with the elaboration likelihood model by Petty and Cacioppo (1986), which differentiates between two paths of information processing. A person can either elaborately pay attention to the argument strength of a message or rather superficially decide to like or dislike a message for less sophisticated reasons. In other words, processing can occur on a *central* or a *peripheral route*. Attitude change can be successful for either of these ways although it has been shown that using the central route can result in a more stable and persistent change of attitudes (Cialdini, Petty, & Cacioppo, 1981). Personal involvement has been studied as a factor that influences which route of information processing is taken. A person that is highly involved in a certain issue is also more likely to process information through a central route (Johnson & Eagly, 1989). Personal involvement thereby motivates more elaborate information processing of arguments. In support of this idea, Petty, Cacioppo, and Schumann (1983) were able to show that peripheral cues of information processing in an advertisement did not have an impact on attitudes for participants with high product involvement as opposed to participants with low product involvement.

OVERVIEW

Based on these empirical and theoretical considerations, we hypothesized that injunctive normative beliefs and personal involvement would moderate the relationship between descriptive normative beliefs and behavior. More specifically, in reference to the research on aligned norms we expected that this relationship would be stronger for individuals who perceive others as approving of conservation behavior (i.e., high injunctive normative beliefs). Furthermore, building on the theoretical framework on attitude strength we reasoned that individuals with high personal involvement in energy conservation issues would process information on those issues more elaborately than individuals with low personal involvement. As indicated above, there is empirical support for the assumption that social influence can work nonconsciously and without much elaboration, which leads us to hypothesize that the relationship between descriptive normative beliefs and behavior would be weaker for individuals with high personal involvement due to their higher willingness to process and elaborate on the information.

Our study reports secondary analyses of data from a telephone survey of California residents. Descriptive normative beliefs were measured, along with self-reported efforts to conserve energy,

injunctive normative beliefs, and personal involvement in energy conservation issues. Additional analyses of this dataset, examining the bivariate relationship between several reported “reasons for conservation” (including normative beliefs), are reported by Nolan et al. (2008). In the current analyses, our interest was in the moderating roles of personal involvement and injunctive normative beliefs.

METHOD

Participants

Participants were recruited in California using random digit dialing through Computer Assisted Telephone Interviewing (CATI) software. The total sample consisted of 1604 California Residents, 678 males and 926 females. The average age of the participants was 47.02 (SD 15.61, range 18–92). The majority of the participants identified themselves as white (58%), the rest of the sample identified themselves as Hispanic (27%), Black African American (6%), Asian American or Pacific Islander (6%), Native American (2%) and other (3%). Most of the interviews were conducted in English (88%), the rest in Spanish (12%). Participants were also asked a range of other demographic characteristics such as income and level of education. The majority of the participants reported either having some college education (30%) or being a college graduate (25%). Income varied among our participants, but the modal response indicated a yearly income of “\$50 000 to under \$75 000” (18%).

Materials

Descriptive normative beliefs were measured similar to Nolan et al. (2008): How often do you think your neighbors try to conserve energy? How often do you think residents of your city try to conserve energy? How often do you think California residents try to conserve energy? How often do you think your friends try to conserve energy? This last item (normative beliefs about friends) was added for the current analyses in an effort to improve the operationalization of descriptive normative beliefs. Responses were measured on a four-point scale, from 1 (never) to 4 (almost always). The four items were averaged to create scale scores; Cronbach’s α for the four belief items was .82 ($M = 2.64$; $SD = .67$).

Personal involvement was measured using a four-item scale: How often do you think about energy conservation? How big of an issue is energy conservation in your life? How much do you care about energy conservation? How knowledgeable are you about energy conservation? Responses were measured on a four-point scale, from 1 (not at all) to 4 (extremely). Cronbach’s α for the four items was .78 ($M = 2.79$; $SD = .62$). These items were also averaged to create scale scores.

Self-reported conservation behavior was measured on a four-point scale using one item: How often do you try to conserve energy? Responses to this item ranged from 1 (never) to 4 (always).

Lastly, injunctive normative beliefs were measured using the following three questions: How much do you think your neighbors approve of people who try to conserve energy? How much do you think residents of your city approve of people who try to conserve energy? How much do you think California residents approve of people who try to conserve energy? Participants rated these questions on a scale from 1 (not at all) to 4 (extremely). Cronbach’s α for these three items was .80 ($M = 2.68$, $SD = .68$).

Procedure

The data was obtained over a 2-year-period. Data were stratified by region of the state (Northern, Bay Area, Central, Los Angeles, Southern). Interviews were conducted in collaboration with the Social and Behavioral Research Institute at California State University San Marcos. Each interview took approximately 13 minutes to complete. The response rate was 40% (see Council of American Survey Research Organizations, 1982, for a description of this measure).

RESULTS

The data set was analyzed in order to examine the moderated relationship between descriptive normative beliefs and behavior. We reasoned that descriptive normative beliefs would be more strongly related to behavior for individuals who were *less* personally involved in conservation issues. That is, descriptive normative beliefs affect behavior through peripheral processes, and if people think about or otherwise elaborate on the reasons for energy conservation, the relationship between descriptive normative beliefs and behavior will weaken. Furthermore, high injunctive normative beliefs should strengthen the relationship between descriptive normative beliefs and behavior, magnifying the impact of descriptive normative beliefs on behavior.

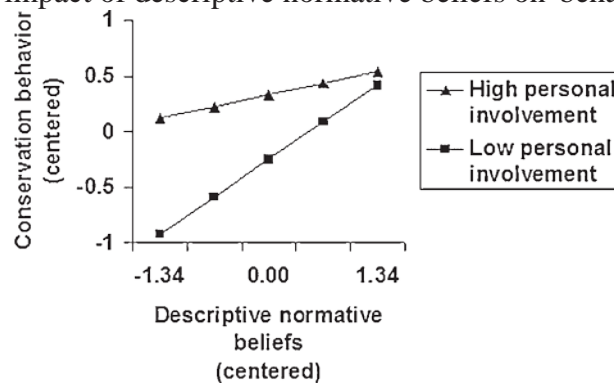


Figure 1. Simple slopes graph for the moderating role of personal involvement in the relationship between descriptive normative beliefs and conservation behavior

Using Pearson's correlation coefficient, we found a significant relationship between descriptive normative beliefs and conservation behavior ($r = .37, p < .01$). An even stronger correlation was found for the personal involvement scale and conservation behavior ($r = .46, p < .01$). Descriptive normative beliefs were also significantly correlated with injunctive normative beliefs ($r = .45, p < .01$).

To test the moderating role of personal involvement, we followed the analytic procedure outlined by Aiken and West (1991) involving a multiplicative interaction term, and a simple slopes analysis. All analyses were performed on centered data to avoid possible problems with multicollinearity. The

results from our first moderated regression showed that both descriptive normative beliefs ($b = .33$) and involvement ($b = .48$) were uniquely predictive of conservation behavior ($p < .01$). However, these effects were qualified by a significant multiplicative effect ($b = -.28$; $p < .001$; $R = .54$; $F(3, 1473) = 204.79$; $p < .001$; constant = .04). Using simple slopes analyses, we found that the relationship between descriptive normative beliefs and behavior was strongest for respondents who were *low* in involvement (defined as $-.62$, one standard deviation below the mean; $\hat{Y}_{low} = 0.50X - .25$). The relationship between descriptive normative beliefs and conservation behavior was substantially smaller, but still positive, for high involvement (defined as $.62$, one standard deviation above the mean; $\hat{Y}_{high} = 0.16X + .33$). While there was an overall positive relationship between descriptive normative beliefs and behavior, the relationship was considerably stronger for participants low in personal involvement (see Figure 1).

The same analytic approach was used to test our second hypothesis about the moderating role of injunctive normative beliefs (i.e., believing that others approve of conservation behavior). The results of our second moderated regression analysis revealed that descriptive normative beliefs were again predictive of conservation behavior ($b = .43$, $p < .01$). Injunctive normative beliefs showed a positive relationship with conservation behavior ($b = .14$, $p < .01$). A significant multiplicative effect revealed the moderation of injunctive normative beliefs ($b = .12$, $p < .001$, $R = .39$, $F(3, 1446) = 85.32$, $p < .001$; constant = $-.002$). The use of simple slopes analyses showed that the relationship between descriptive normative beliefs and behavior was strongest for individuals with *high* injunctive normative beliefs (defined as $+.68$, one standard deviation above the mean; $\hat{Y}_{high} = 0.53X - .05$). For individuals with low injunctive normative beliefs, the relationship was still positive but weaker (defined as $-.68$, one standard deviation below the mean; $\hat{Y}_{low} = 0.36X + .05$). These results indicate an overall positive relationship between descriptive normative beliefs and behavior as well, but show that this relationship is stronger for individuals with higher injunctive normative beliefs (see Figure 2).

Finally, we conducted an analysis in which injunctive norms were used to predict efforts to conserve energy, and we tested the moderating role of personal involvement. This was done in order to extend our theoretical model. Unlike descriptive normative beliefs, we hypothesized that greater elaboration resulting from personal involvement would strengthen the relationship between injunctive normative beliefs and behavior (see Cialdini, 2003, Figure 2, for a model showing different influence pathways for descriptive and injunctive norms). However, the results from our statistical analyses showed that the injunctive normative belief x personal involvement multiplicative term was not statistically significant, though the pattern of results was in the expected direction.

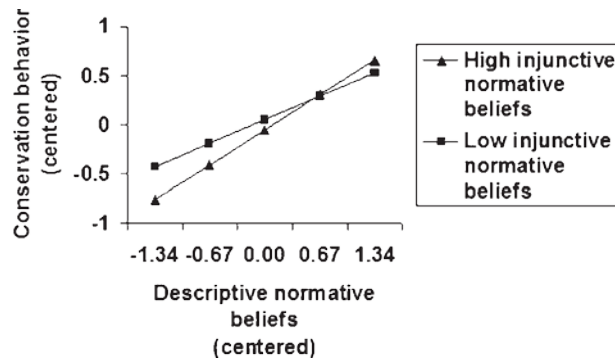


Figure 2. Simple slopes graph for the moderating role of injunctive normative beliefs in the relationship between descriptive normative beliefs and conservation behavior

DISCUSSION

Our analyses revealed several interesting findings. As a starting point, we were able to replicate the well-established finding of a positive correlation between descriptive normative beliefs and behavior. This result indicates that efforts to conserve energy are significantly related to one's belief about how often others conserve energy. Additionally, we found a significant correlation between personal involvement and conservation behavior which shows that conservation efforts increase with personal involvement in conservation issues. This finding supports previous studies, which have already shown that high personal involvement increases the likelihood of attitude-congruent behavior (e.g., Krosnick, 1988; Sherif, Kelly, Rodgers, Sarup, & Tittler, 1973).

In addition to the meaningful bivariate relationships, we also found evidence for several moderated effects. First, the relationship between descriptive normative beliefs and conservation behavior was moderated by personal involvement. As shown in Figure 1, for individuals low in involvement, descriptive normative beliefs were a stronger predictor of behavior. But for individuals who were high in involvement, the relationship between descriptive normative beliefs and behavior was substantially smaller (though still positive). We interpret this effect in line with the elaboration likelihood model (Petty & Cacioppo, 1986). In accord with this notion, we propose that descriptive normative beliefs can influence behavior without conscious processing, and the impact of descriptive normative beliefs on behavior should be weaker if conscious processing is involved. In other words, we conclude from these findings that descriptive normative beliefs work on a peripheral route of information processing, and the effect is weakened when factors like personal involvement motivate central route processing.

Our results also showed that injunctive normative beliefs moderated the relationship between descriptive normative beliefs and behavior, but in a different way. Our analyses revealed that high injunctive normative beliefs can strengthen the impact of descriptive normative beliefs on behavior. The highest behavior rates were shown for high descriptive *and* high injunctive norms. Believing that other people engage in a highly approved behavior therefore increases the likelihood of engaging in that behavior. These findings are consistent with prior research on aligning normative information which has shown that combined normative messages which include both descriptive and injunctive normative information have a higher impact on behavior than messages only including one of these norms (Cialdini et al., 2006; Schultz, Khazian, & Zaleski, 2008).

Interestingly, descriptive and injunctive normative beliefs were only modestly correlated ($r = .45$). So while beliefs about the prevalence and approval of a behavior covary, there is a considerable degree of slippage. That is, there are instances where individuals think that other people approve of conservation, but yet also believe that other people do not do it. Or conversely, believe that others engage in conservation actions but yet do not approve of it. On the surface, such misaligned normative beliefs might seem uncommon, but in fact, we suggest that such instances are quite commonplace. For example, an individual might believe that others engage in a behavior out of fear of negative consequences, and not necessarily because they “approve” of it. Such inconsistencies are reminiscent of the cognitive dissonance literature, where individuals can hold dissonant beliefs about themselves (e.g., I approve of conserving energy, but I do not engage in conservation behaviors). However, unlike a dissonance paradigm, our results suggest that inconsistency in normative beliefs reduces the pressure to conform. It is when the descriptive (others do it) and injunctive (others approve of doing it) norms are aligned that norms are particularly influential. While there has been prior research on the impact of misaligned normative messages (Cialdini et al., 2006; Goldstein & Cialdini, 2007), there are few studies that have examined the impact of misaligned normative beliefs. This latter issue seems a fruitful area for future research.

Throughout this paper, we have worked from a social influence framework. That is, normative beliefs influence behavior. This effect can be moderated by various processes—like personal involvement or aligning the descriptive and injunctive norms—but the effect is theoretically causal. Yet our data can also be viewed from a social dilemmas framework (e.g., Dawes, McTavish, & Shaklee, 1977; DeVries & Wilke, 1992). One consistent finding in the dilemmas paradigm is that individuals are less likely to cooperate and act in ways that benefit the group (typically requiring self sacrifice) in the absence of evidence that others in the group are also cooperating. From this perspective, normative information serves to reduce social uncertainty, and thereby foster more cooperative behaviors (e.g., Biel & Gärling, 1995).

While norms can clearly play a role in social dilemmas, we do not view our data as consistent with this interpretation. First, we have argued that individuals are generally motivated to conform to the norm. From a social dilemma perspective, norms moderate a person’s willingness to engage in behaviors that benefit the collective, but the norms *per se* do not necessarily motivate these actions directly. In essence, the dilemmas perspective suggests that norms can prevent an action, but not necessarily motivate it. That is, descriptive normative beliefs serve as an important moderator between a desire to act in ways that benefit the collective, and specific actions. Yet prior studies (Cialdini et al., 1990; Nolan et al., 2008; Schultz, Khazian, et al., 2008) have shown that normative information can exert a direct impact on behavior, even among individuals who are not otherwise motivated to act.

A second problem with interpreting our findings (and normative social influence more broadly) from a social dilemmas framework pertains to the behavioral domain. The data reported in this paper are part of a larger body of research examining the direct influence of norms on behavior. From a social dilemmas perspective, norms serve as a barrier to collective action. But the norms research has examined many behaviors that do not lend themselves to a social dilemmas analysis (e.g., alcohol consumption, using sunscreen to prevent skin cancer, wearing seat belts, safe sex, and many others). For these behaviors, it is unclear that pursuing one’s self interest is at odds with collective interests. Yet even in these domains we see evidence of normative influence. Combined, we see solid evidence for norms as a fundamental behavioral motivation, and evidence that is consistent with the Focus Theory of Normative Conduct (Cialdini et al., 1990). Clearly normative

beliefs can play a role in reducing social uncertainty and addressing social dilemmas, but we do not interpret the current findings along these lines.

Despite the theoretically meaningful findings, we should note some limitations of our data. First of all, our behavioral measure for energy conservation consisted of a single item that assessed the personal effort to conserve (“How often do you try to conserve energy?”). Future studies with multi-item scales for actual behavior could give more insight into the effects of descriptive normative beliefs on behavior. Furthermore, there was no existing measure to be found for personal involvement in conservation issues and therefore we created our own scale. Although the items showed good internal reliability (Cronbach’s α .78) the scale is new and not yet validated against other measures. Further studies are needed to test the validity of this scale.

For future studies, the focus should shift towards actual behavioral measures when examining the impact of descriptive normative beliefs on behavior. Additionally, the moderated effects we found should be taken into consideration for energy conservation campaigns. High descriptive norms could be an even more effective tool in stimulating conservation behavior if they are combined with high injunctive norms and target a population with low personal involvement in conservation issues. An exploration of other possible moderators could be useful in further determining the role of central and peripheral processing in the mechanisms of social influence.

ACKNOWLEDGEMENTS

Funding for this study was provided by a grant from the Hewlett Foundation (2001-7396). Our appreciation goes to Kimberly Brown, Allen Risley, and Lori Large from the Social and Behavioral Research Institute, and Azar Khazian for their help.

REFERENCES

- Agostinelli, G., Brown, J., & Miller, W. (1995). Effects of normative feedback on consumption among heavy drinking college students. *Journal of Drug Education, 25*, 31–40.
- Aiken, L., & West, S. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Biel, A., & Gärling, T. (1995). The role of uncertainty in resource dilemmas. *Journal of Environmental Psychology, 15*, 221–233.
- Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science, 12*, 105–109.
- Cialdini, R. B. (2005). Basic social influence is underestimated. *Psychological Inquiry, 16*, 158–161.
- Cialdini, R. B., Demaine, L., Sagarin, B. J., Barrett, D. W., Rhoads, K. L., & Winter, P. L. (2006). Managing social norms for persuasive impact. *Social Influence, 1*, 3–15.
- Cialdini, R. B., Petty, R. E., & Cacioppo, J. T. (1981). Attitude and attitude change. *Annual Review of Psychology, 32*, 357–404.
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology, 58*, 1015–1026.
- Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed., Vol. 2, pp. 151–192). Boston: McGraw-Hill.
- Clapp, J. D., Lange, J. E., Russel, C., Shillington, A., & Voas, R. B. (2003). A failed norms social marketing campaign. *Journal of Studies on Alcohol, 64*, 409–414.
- Corral, V., Frías, M., Pérez, F., Orduño, V. Y., & Espinoza, N. (2002). Residential water consumption, motivation for conserving water, and the continuing tragedy of the commons. *Environmental Management, 30*, 527–535.
- Council of American Survey Research Organizations. (1982). On the definition of response rates: A social report of the CASRO task force on completion rates. Available online at: <http://www.casro.org/resprate.cfm>.
- Dahlstrand, U., & Biel, A. (1997). Pro-environmental habits: Propensity levels in behavioral change. *Journal of Applied Social Psychology, 27*, 588–601.
- Dawes, R. M., McTavish, J., & Shaklee, H. (1977). Behavior, communication, and assumptions about other people's behavior in a commons dilemma situation. *Journal of Personality and Social Psychology, 35*, 1–11.
- Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *Journal of Abnormal and Social Psychology, 51*, 629–636.
- DeVries, S., & Wilke, H. A. M. (1992). Constrained egoism and resource management under uncertainty. In W. Liebrand, D. Messick, & H. Wilke (Eds.), *Social dilemmas: Theoretical issues and research findings* (pp. 81–99). Oxford: Pergamon.
- Donaldson, S. I., Graham, J. W., & Hansen, W. B. (1994). Testing the generalizability of intervening mechanism theories: Understanding the effects of adolescent drug use prevention interventions. *Journal of Behavioral Medicine, 17*, 195–216.
- Donaldson, S. I., Graham, J. W., Piccinin, A. M., & Hansen, W. B. (1995). Resistance-skills training and the onset of alcohol use: Evidence for beneficial and potentially harmful effects in public

- schools and in private Catholic schools. *Health Psychology*, *14*, 291–300.
- Eisenberg, M. F., & Wechsler, H. (2003). Social influences on substance-use behaviors of gay, lesbian, and bisexual college students: Findings from a national study. *Social Science & Medicine*, *57*, 1913–1923.
- Garvill, J. (1999). Choice of transportation mode: Factors influencing driver's willingness to reduce personal car use and support car regulations. In M. Foddy, M. Smithson, S. Schneider, & M. Hogg (Eds.), *Resolving social dilemmas: Dynamic, structural, and intergroup aspects* (pp. 253–262). Philadelphia: Psychology Press.
- Goldstein, N., & Cialdini, R. (2007). Using social norms as a lever of social influence. In A. Pratkanis (Ed.), *The science of social influence: Advances and future progress* (pp. 167–191). New York: Psychology Press.
- Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. *Journal of Consumer Research*, *35*, 472–482.
- Hogg, M. A. (2003). Social identity. In M. R. Leary, & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 462–479). New York: The Guilford Press.
- Hornik, J., Cherian, J., Madansky, M., & Narayana, C. (1995). Determinants of recycling behavior: A synthesis of research results. *Journal of Socio-Economics*, *24*, 105–127.
- Jetten, J., & Spears, R. (1997). Strength of identification and intergroup differentiation: The influence of group norms. *European Journal of Social Psychology*, *27*, 603–609.
- Johnson, B. T., & Eagly, A. H. (1989). Effects of involvement on persuasion: A meta-analysis. *Psychological Bulletin*, *106*, 290–314.
- Krosnick, J. A. (1988). The role of attitude importance in social evaluation: A study of policy preferences, presidential candidate evaluations, and voting behavior. *Journal of Personality and Social Psychology*, *55*, 196–210.
- Lee, C. M., Geisner, I. M., Lewis, M. A., Neighbors, C., & Larimer, M. E. (2007). Social motives and the interaction between descriptive and injunctive norms in college student drinking. *Journal of Studies on Alcohol and Drugs*, *68*, 714–721.
- McAuliffe, B. J., Jetten, J., Hornsey, M. J., & Hogg, M. A. (2003). Individualist and collectivist norms: When it's ok to go your own way. *European Journal of Social Psychology*, *33*, 57–70.
- Neighbors, C., Lewis, M. A., & Larimer, M. E. (2004). Targeting misperceptions of descriptive drinking norms: Efficacy of a computer-delivered personalized normative feedback intervention. *Journal of Consulting and Clinical Psychology*, *72*, 434–447.
- Nolan, J., Schultz, P. W., Cialdini, R. B., Griskevicius, V., & Goldstein, N. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin*, *34*, 913–923.
- Pendry, L., & Carrick, R. (2001). Doing what the mob do: Priming effects on conformity. *European Journal of Social Psychology*, *31*, 83–92.
- Perkins, H. W. (2002). Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies on Alcohol*, *14*, 164–172.
- Perkins, H. W. (2003). The emergence and evolution of the social norms approach to substance abuse prevention. In H. W. Perkins (Ed.), *The social norms approach to preventing school and college age substance abuse: A handbook for educators, counselors, and clinicians* (pp. 3–18). San Francisco, CA: Jossey-Bass.

- Perkins, H. W., & Berkowitz, A. D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions, 21*, 961–976.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 123–205). Orlando, FL: Academic.
- Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research, 10*, 135–146.
- Rimal, R. N., & Real, K. (2005). How behaviors are influenced by perceived norms: A test of the theory of normative social behavior. *Communication Research, 32*, 389–414.
- Schultz, P. W. (1999). Changing behavior with normative feedback interventions: A field experiment on curbside recycling. *Basic and Applied Social Psychology, 21*, 25–36.
- Schultz, P. W., Khazian, A. M., & Zaleski, A. C. (2008). Using normative social influence to promote conservation among hotel guests. *Social Influence, 3*, 4–23.
- Schultz, P. W., Nolan, J., Cialdini, R., Goldstein, N., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science, 18*, 429–434.
- Schultz, P. W., Tabanico, J., & Rendón, T. (2008). Normative beliefs as agents of influence: Basic processes and real-world applications. In R. Prislin, & W. Crano (Eds.), *Attitudes and persuasion*. New York: Psychology Press.
- Sherif, C. W., Kelly, M., Rodgers, L., Sarup, G., & Tittler, B. I. (1973). Personal involvement, social judgment, and action. *Journal of Personality and Social Psychology, 27*, 311–328.
- Staats, H. J., Wit, A. P., & Midden, C. Y. H. (1996). Communicating the greenhouse effect to the public: Evaluation of a mass media campaign from a social dilemma perspective. *Journal of Environmental Management, 45*, 189–203.
- Terry, D. J., & Hogg, M. A. (1996). Group norms and the attitude-behavior relationship: A role for group identification. *Personality and Social Psychology Bulletin, 22*, 776–793.
- Thomsen, C. J., Borgida, E., & Lavine, H. (1995). The causes and consequences of personal involvement. In R. E. Petty, & J. A. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 191–214). Mahwah, NJ: Erlbaum.
- van Knippenberg, D. (2000). Group norms, prototypicality, and persuasion. In D. Terry (Ed.), *Attitudes, behavior and social context: The role of norms and group membership* (pp. 157–170). Mahwah, NJ: Erlbaum.
- Wechsler, H., Nelson, T. F., Lee, J. E., Seibring, M., Lewis, C., & Keeling, R. P. (2003). Perception and reality: A national evaluation of social norms marketing interventions to reduce college students' heavy alcohol use. *Journal of Studies on Alcohol, 64*, 484–494.