The authors explore the effects of highlighting improvement in a population’s exercise habits on fitness-related purchase behavior. Whereas consumers generally conform to norms—increasing fitness intentions when the exercise norm is high (vs. low)—the authors find that this relationship reverses when the norm is also improving.

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Norms as Standards vs. Self-Descriptions:
How Dynamic Information Shifts Interpretation of Normative Messages

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ABSTRACT

Social norms are widely used to promote both personally and societally beneficial behaviors. Many normative messages seek to influence the audience by presenting static information—information about the frequency, incidence, or prevalence of some behavior or condition among members of a population. For example, a New York Times headline “America’s Diet: Too Sweet by the Spoonful” presents the norm for nutrition in static terms (Brody 2009). However, normative messages can also convey dynamic information—information about how the frequency, incidence, or prevalence of some behavior has been changing in a given population. For example, the headline, “Americans’ Eating Habits Take a Healthier Turn, Study Finds,” presents the norm for nutrition in dynamic terms (Beck and Schatz 2014). Although a substantial body of research has explored the mechanisms by which social norms influence behavior, this literature mainly focuses only on normative messages presenting static information (Goldstein et al., 2008; Schultz et al., 2007). The present research departs from prior work by investigating the effects of dynamic information in normative messages about exercise, a context of particular importance given a national surge in efforts to battle obesity and obesity-related illnesses.

The notion that people tend to align their behavior to social norms is well-documented in behavioral research (Bearden and Etzel 1982; Venkatesan 1966). These descriptive norms (i.e., what most people are doing) influence consumers by highlighting a potentially successful, or at least acceptable, course of action—“If everyone is doing it, it must be a sensible thing to do” (Cialdini et al. 1990, 1015). Moreover, adhering to norms often increases social approval (Fisher and Ackerman 1998; White and Simpson 2013). Thus, norms can serve as a standard to which people assimilate. However, this conclusion is predicated on research that largely examines normative messages presenting static information. What remains unknown is how people respond when normative messages also present dynamic information—specifically, information suggesting improvement.

Extant research has found that people have a general preference for improving trajectories over more stable ones (Hsee and Abelson 1991; Hsee, Abelson, and Salovey 1991; Kahneman and Tversky 1979). Furthermore, individuals tend to perceive improvement in themselves even where it has not occurred (Wilson and Ross 2001). Accordingly, we propose that when a normative message conveys improvement, the message will be aligned with people’s self-views, increasing the likelihood that they interpret the message as a self-description (vs. a standard). Thus, a low (vs. high) exercise norm will be self-threatening and increase consumers’ fitness intentions (Gao, Wheeler, and Shiv 2008; Taylor, Neter, and Wayment 1995). This constitutes a reversal of the effect of normative messages that only present static information.

Two experiments explore the proposed effects and examine the moderating role of implicit theories to shed light on the underlying process. Prior research on implicit theories has found that entity theorists tend to make trait attributions for their performance (Burnette 2010; Hong et al. 1999), and thus they should be most susceptible to the self-descriptive interpretation of norms fostered by dynamic information. Consistent with this, we demonstrate that the proposed reversal of effects is most pronounced for those who strongly endorse entity theories of fitness. In doing so, this research makes three contributions. First, the experiments reported here enrich the literature on social norms by providing an initial investigation of the influence of dynamic information in normative messages. Second, the preponderance of work on implicit theories and self-regulation suggests that incremental theories are more effective in promoting self-improving and self-beneficial behaviors (Burnette 2010; Burnette et al. 2013). In contrast, we demonstrate a situation in which entity theories can promote self-regulatory behavior. Lastly, this research makes a practical contribution to health marketing. Specifically, we shed light on when dynamic information in normative appeals will be effective in motivating healthy behavior and when it is likely to backfire.

SOCIAL NORMS AND STATIC INFORMATION: NORMS AS STANDARDS

Research from a variety of disciplines has demonstrated the influence of norms in numerous domains, including environmental consciousness (Goldstein, Cialdini, and Griskevicius 2008; Schultz et al., 2007; White and Simpson 2013), charitable giving (Croson, Handy, and Shang 2009; Croson and Shang 2008), volunteerism (Fisher and Ackerman 1998), and physical fitness (Christakis and Fowler 2007). Across these disparate contexts, considerable evidence suggests that individuals assimilate to salient social norms—i.e., what they believe most others are doing—for better or for worse. For example, Cialdini and colleagues (1990) found that when the norm for littering is low and salient, people reduce their littering; on the other hand, when the norm for littering is high and salient, people increase their tendency to litter. In later work, Schultz et al. (2007) demonstrated a similar effect in the context of household energy consumption. Specifically, households decreased their energy consumption when they received a message informing them that they used more electricity than the norm, and increased their consumption when they were informed the opposite. More related to the context of our study, medical research on the spread of obesity has invoked a similar norms-assimilation process to explain the spread of obesity throughout social networks (Christakis and Fowler 2007). Specifically, Christakis and Fowler suggested that close relationships with obese individuals color perceptions of fitness norms, ultimately increasing the likelihood of personal weight gain. Thus it appears that social norms are generally used as standards for behavior.

In most of the prior norms research, whether the focal norms are explicitly stated (e.g., Schultz et al. 2007; White and Simpson 2013) or merely implied (e.g., Cialdini et al. 1990; Reno, Cialdini, and Kallgren 1993), they primarily provide static information describing what others are doing presently. For example, in their research on how norms influence sustainable consumer behaviors, White and Simpson (2013) show some participants a normative message that reads, “Your neighbors are grasscycling.” This norm presents static information—at this cross-section of time, people in a relevant reference group are engaging in a particular behavior—that should motivate other members of the reference group to follow suit. However, a similar normative message could have read “Your neighbors are grasscycling more than before,” providing dynamic information about how sustainable behaviors have been changing.
Although it is clear that normative message conveying static information should promote behavioral assimilation, extant research is silent on what happens when these messages conveying dynamic information. Outwardly, both normative messages provide essentially the same information, as far as suggesting what other people are doing. However, for reasons delineated in the following section, we do not expect these two types of normative messages to influence consumers in the same manner.

SOCIAL NORMS AND DYNAMIC INFORMATION: NORMS AS SELF-DESCRIPTIONS

A long tradition of behavioral research has suggested that people are more sensitive to change than absolute states (Kahneman and Tversky 1979). Furthermore, research on satisfaction judgments has found that people generally prefer improvement to stability, deriving greater satisfaction from the same outcome when it has resulted from improvement than when it has not (Hsee and Abelson 1991; Hsee, Abelson, and Salovey 1991). Thus, it is likely that normative messages presenting dynamic information will have different effects from those presenting static information; however, the nature of this difference is not immediately clear.

Consistent with the general preference for improving trajectories, previous work on temporal comparisons has found that people tend to believe that they have been improving over time, and these perceptions are upheld whether or not there is any objective evidence (Wilson and Ross 2001). Across a variety of dimensions, Wilson and Ross found that people evaluated their current selves much more favorably than their past selves, and this held for students, parents, and university staff alike. Given this prediction for improvement, we propose that normative messages presenting dynamic information about improvement will be consistent with consumers’ self-views. Therefore, consumers will interpret these norms as self-descriptions rather than standards for behavior. When these self-descriptions are threatening (i.e., when the norm for exercise is improving but still low), this should motivate behaviors that bolster the threatened aspect of the self (Gao, Wheeler, and Shiv 2008; Taylor et al. 1995). Thus, norms communicating dynamic information about improvement can ultimately have the opposite effect from norms that only convey static information.

Insofar as normative messages conveying improvement are interpreted as self-descriptions, the motivating effect of a low (vs. high) norm should be stronger among individuals who are more likely to be threatened by unfavorable self-descriptions. Implicit theories—whether one tends to view traits as more malleable (incremental theory) or fixed (entity theory)—have been shown to influence proneness to self-threat. Specifically, entity theorists are more likely to make trait attributions for performance and are primarily concerned with demonstrating their high level of positive attributes (Burnette 2010; Hong et al. 1999). Thus, they should be more threatened by a low norm that’s interpreted as a self-description. Accordingly, we posit that when the norm for exercise is low but improving, entity (vs. incremental) theorists will be more threatened by the low norm, which to them is an unflattering self-description. Thus, rather than conforming to the low norm, entity theorists will be more likely to pursue self-beneficial behaviors to counter the threat. Moreover, this effect should be attenuated for incremental theorists, who are less likely to be threatened by negative self-descriptions and consequently less motivated to take remedial action. Importantly, this prediction opposes one based on the notion that incremental theorists believe that they can improve their fitness and thus should be more motivated by the dynamic norm than entity theorists.

STUDY 1

The goal of study 1 was to test the prediction that consumers will assimilate to fitness norms conveying static information, but this effect will be reversed when then norm also presents dynamic information about improvement. Accordingly, we manipulate the level of the static information (i.e., high vs. low exercise norm) as well as the presence of dynamic information (i.e., exercise has been increasing or control).

Design and Procedure

116 participants from Amazon’s Mechanical Turk online panel completed this study for $0.40. Participants were randomly assigned to one of four conditions in a 2 (static information: low vs. high) x 2 (dynamic information: increasing vs. control) design. Under the guise of a survey on fitness, participants answered filler questions about their weight and exercise tendencies. While the system supposedly recorded their responses and prepared the next portion of the survey, participants were shown a normative fitness message in which the critical manipulations were embedded. In all conditions this fitness message specified that the average American adult exercises 2 hours a week. However, to manipulate whether this was perceived as a low or high amount of exercise (i.e., static information), we described 2 hours as “an unimpressive (impressive) 20 minutes every day.” Moreover, to manipulate dynamic information, the message in the increasing condition specified that Americans’ weekly exercise time had increased over the past 3 years. The control condition message did not mention any changes in weekly exercise.

The dependent measures were as follows: All participants rated their anxiety about their future health (concerned, worried, anxious, a = 97) on 1 (not at all) to 7 (very much) scales and their perceived need for improvement (“I need to take better care of my body,” “I need to improve my fitness,” “I need to devote more time to exercising,” a = .92) on a 1 to 7 Likert scale. Next, as part of a supposedly unrelated product evaluation task, participants viewed a series of advertisements for gym memberships. After viewing each ad, they rated their intentions of joining the gym (improbable-probable, impossible-possible, unlikely-likely, a = .96) on 7-point scales, as well as their willingness to pay for a gym membership in U.S. dollars. Finally, participants completed a manipulation check in which they rated how much exercise American adults get on a 1 (small amount) to 7 (large amount) scale and provided basic demographic information.

Results and Discussion

A 2 (static information) x 2 (dynamic information) ANOVA on the manipulation check revealed only a main effect of static information. As expected, those in the high exercise condition (M = 2.74) perceived American adults to exercise more than those in the low exercise condition (M = 1.83, F(1, 112) = 19.39, p < .001).

Moreover, a 2 x 2 ANOVA on anxiety about future health revealed the predicted interaction (F(1, 112) = 4.49, p < .05). Simple contrasts revealed that, in the control condition, those in the high (vs. low) exercise condition had directionally but not significantly higher anxiety (M = 4.41 vs. 3.74, F(1,112) = 1.90, p = .17). However, when the norm for exercise was improving, those in the high (vs. low) exercise condition had directionally but not significantly lower anxiety (M = 3.30 vs. 4.06, F(1,112) = 2.64, p = .11). Moreover, when the weekly exercise norm was high, anxiety was lower for those in the improving condition than the control condition (M = 3.30 vs. 4.41, F(1,112) = 5.35, p < .05).

For perceived need for improvement, a 2 x 2 ANOVA yielded a significant interaction (F(1,112) = 9.79, p < .01). In the control con-
dication, those in the high (vs. low) exercise condition reported a marginally higher need for improvement ($M = 6.08$ vs. $5.38$, $F(1,112) = 3.26$, $p < .10$); however, in the improvement condition, those in the high (vs. low) condition reported a lower need for improvement ($M = 4.77$ vs. $5.76$, $F(1,112) = 6.95$, $p = .01$). Again, when the norm was high, need for improvement was lower for those in the improving condition than the control condition ($M = 4.77$ vs. $6.08$, $F(1,112) = 11.48$, $p < .001$).

Consistently, a $2 \times 2$ ANOVA on gym membership intentions revealed a significant interaction ($F(1,112) = 8.61$, $p < .01$), such that in the control condition intentions were directionally (but not significantly) higher when weekly exercise was high (vs. low) ($M = 3.81$ vs. $3.23$, $F(1,112) = 1.45$, NS); however, the opposite occurred in the improvement condition ($M = 2.35$ vs. $3.72$, $F(1,112) = 8.87$, $p < .01$). When the weekly exercise norm was high, intentions were lower for those in the improving condition than the control condition ($M = 2.35$ vs. $3.81$, $F(1,112) = 9.50$, $p < .01$). Lastly, a $2 \times 2$ ANOVA on willingness-to-pay (WTP) for a gym membership revealed the predicted interaction ($F(1,112) = 5.91$, $p < .05$). In the control condition, those in the high (vs. low) exercise condition reported a marginally higher WTP ($M = 25.56$ vs. $18.12$, $F(1,112) = 3.04$, $p < .10$); however, in the improvement condition, this was reversed ($M = 14.04$ vs. $21.00$, $F(1,112) = 2.86$, $p < .10$). Moreover, when the weekly exercise norm was high, intentions were lower for those in the improving condition than the control condition ($M = 14.04$ vs. $25.56$, $F(1,112) = 7.40$, $p < .01$).

Study 1 provided initial evidence that individuals interpret norms as standards when they present static information, but as self-descriptions when they present dynamic information. Whereas consumers generally were more interested in fitness (as evidenced by self-reported need for improvement, intentions to join a gym, and willingness to pay for a gym membership) when the norm for weekly exercise time was higher, this relationship reversed when the norm was also improving. Furthermore, it appears that when the norm was higher, informing people that it had been improving had a licensing effect on their fitness intentions. Importantly, the fact that anxiety was higher in the control condition than the improvement condition for those who saw the high exercise norm suggest that the effects on WTP are not due to any self-efficacy concerns. Conceivably, consumers might disengage from fitness goals if they believe that they are too far behind others to ever catch up. However, given that those in the high exercise/improving condition actually had the lowest level of anxiety, it is unlikely that threatened self-efficacy can account for our effects. In study 2, we seek stronger evidence of the proposed process by examining the moderating role of implicit theories. Specifically, we expect the interactions obtained in study 1 to arise for those who endorse entity theories of fitness, but not for those who endorse incremental theories of fitness.

STUDY 2

Design and Procedure

101 participants from Amazon’s Mechanical Turk online panel completed this study for $0.40. Study 2 followed the same basic procedures from study 1 with the following changes: First, to shorten the procedure, we omitted the anxiety and need for improvement measures. Second, participants viewed both gym advertisements and advertisements about fitness-related mobile apps and reported their willingness to pay. Third, after completing the product evaluations we included a measure of implicit theories of fitness (Burnette 2010) to test the underlying process. Specifically, we predicted that the interaction obtained in study 1 would hold for entity theorists, but not incremental theorists. Finally, we also included measures of their general interest in mobile applications and general interest in fitness centers to use as covariates.

Results and Discussion

A $2$ (static information) x $2$ (dynamic information) ANOVA on the manipulation check revealed only a main effect of static information. As expected, those in the high exercise condition ($M = 2.98$) perceived American adults to exercise more than those in the low exercise condition ($M = 2.02$, $F(1,112) = 14.88$, $p < .001$).

To test the predicted three-way interaction on product evaluations, we regressed WTP for the fitness apps on a static information dummy variable (0 = low, 1 = high), dynamic information dummy variable (0 = control, 1 = improvement), standardized implicit theory, the interactions of these three variables, and general interest in mobile apps. This regression revealed main effects of general interest in mobile apps, ($b = .59$, $t = 5.35$, $p < .001$) and static information ($b = 1.77$, $t = 3.21$, $p < .01$); significant two-way interactions between static information and dynamic information ($b = -2.35$, $t = -2.99$, $p < .01$) and dynamic information and implicit theory ($b = -1.93$, $t = -2.29$, $p < .05$); and the hypothesized three-way static x dynamic x implicit theory interaction ($b = 1.93$, $t = 2.05$, $p < .05$). To explore the three-way interaction, we examined the two-way static x dynamic interactions at one standard deviation above and below the mean of implicit theory (with lower scores corresponding to stronger entity theories). As predicted, the two-way interaction was significant at one standard deviation below the mean ($b = -4.37$, $t = 3.35$, $p < .01$), but not at one standard deviation above the mean of implicit theories ($b = .46$, $t = 4.05$, NS). Furthermore, at -1 SD (i.e., entity theorists), the slope of static information was significant and positive for those in the control condition ($b = 1.92$, $t = 2.60$, $p < .05$), and significant and negative for those in the increasing condition ($b = -2.45$, $t = -2.28$, $p < .05$). At +1 SD, the slopes of static information were positive, and only reached significance for those in the control condition (control: $b = 1.63$, $t = 2.11$, $p < .05$; increasing: $b = 1.17$, $t = 1.31$, NS).

The same regression analyses were conducted on WTP for a gym membership, and they revealed a marginally significant three-way interaction ($b = 16.25$, $t = 1.77$, $p < .10$). Again, the static x dynamic interaction was significant at -1 SD of implicit theories ($b = -32.00$, $t = -2.60$, $p < .05$), but not at +1 SD ($b = -0.02$, $t = 0.08$, NS). Furthermore, at -1 SD (i.e., entity theorists), the slope of static information was significant and positive for those in the control condition ($b = 14.92$, $t = 2.14$, $p < .05$), and marginally significant and negative for those in the increasing condition ($b = 17.07$, $t = 1.68$, $p < .10$). At +1 SD, the slopes of static information were positive, but not significant (control: $b = 11.75$, $t = 1.62$, NS; increasing: $b = 11.72$, $t = 1.40$, NS).

In line with our hypothesis, implicit theories moderated the interactive effect of static and dynamic information on fitness-related behavioral intentions. Whereas the static x dynamic interaction obtained in study 1 persisted for entity theorists, who are more prone to interpreting feedback through a self-descriptive lens, this interaction was attenuated for incremental theorists.

GENERAL DISCUSSION

Across two experiments, we explore the effects of dynamic information about improvement on consumers’ response to normative messages. Whereas consumers generally conformed to normative fitness messages conveying static information, the opposite occurred when these messages also included dynamic information about improvement. Furthermore, evidence suggests that this effect was...
driven by differences in the interpretation of social norms presenting static versus dynamic information. While norms presenting only static information were generally interpreted as a standard, norms presenting dynamic information about improvement were interpreted as self-descriptions. Accordingly, in the absence of dynamic information, individuals were more interested in fitness-related products and services when the weekly exercise norm was framed as high (vs. low). However, when the weekly exercise norm was also improving, individuals were less interested in fitness-related products and services when the weekly exercise norm was framed as high (vs. low). Providing evidence of the underlying process, in study 2, we found that this interactive effect arose for individuals who strongly endorsed entity theories of fitness—i.e., those individuals who were more likely to be threatened by an unfavorable self-description—but did not arise for those who endorsed incremental theories of fitness.

In demonstrating these effects, we contribute to the literature on social norms by providing an initial investigation of the influence of normative messages that provide dynamic information. Despite the commonness of such messages, to the best of our knowledge, no research has investigated how their influence on behavior differs from that of more static normative messages. Here, we demonstrated that dynamic information can actually reverse the typical effects of social norms. Additionally, we contribute to research on implicit theories and self-regulatory behaviors. Previous research has suggested that entity theories tend to undermine effective self-regulation (Burnette et al. 2013; Job, Dweck, and Walton 2010; Mukhopadhyay and Johar 2005). However, our results demonstrate a situation in which entity theories will actually lead to the most adaptive responses. Indeed, in study 2, entity theorists were the only ones motivated by improving fitness norms.

Beyond these theoretical contributions, our research has practical implications for the use of normative messages. Although broadcasting a population’s improvement may seem like a favorable thing to do, it can ultimately have negative consequences. Rather than motivating individuals to improve, such messages can ultimately license message recipients to disengage from the positive behaviors, to the extent that they interpret the message as self-descriptive. However, such messages can have the desired positive effects if they also highlight some shortcoming that threatens the recipient. Indeed, prior research has demonstrated how favorable self-relevant information can increase the adaptive responses to negative feedback (Sherman and Cohen 2006; Trope and Neter 1994). Thus, marketers and the media alike should exercise caution in communicating normative messages about improvement, as this might not always be as innocuous as it seems.

Although this research elucidates the process by which dynamic information about improvement alters the interpretation of normative messages, we do not explore the effects of information about decline. Based on our theorizing, these messages should not be interpreted as self-descriptions, given that people do not tend to see themselves as getting worse (Wilson and Ross 2001). Therefore, rather than reversing the effects of static information in normative messages, unfavorable dynamic information might ultimately mirror the effects of static information. We plan to explore this possibility in future research.

REFERENCES


<table>
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<tr>
<th>Study</th>
<th>Summary of Empirical Results</th>
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| Study 1 | 2 (static information) x 2 (dynamic information) interaction on need for improvement ($F(1, 112) = 9.79, p < .01$).  
**Simple Contrasts:**  
Control condition, low (vs. high) norm: ($M = 5.38$ vs. 6.08, $F(1,112) = 3.26, p < .10$);  
Improvement condition, low (vs. high) norm: ($M = 5.76$ vs. 4.77, $F(1,112) = 6.95, p < .01$).  
2-way interaction on gym membership intentions ($F(1, 112) = 8.61, p < .01$).  
**Simple Contrasts:**  
Control condition, low (vs. high) norm: ($M = 3.23$ vs. 3.81, $F(1,112) = 1.45, NS$)  
Improvement condition, low (vs. high) norm: ($M = 3.72$ vs. 2.35, $F(1,112) = 8.87, p < .01$).  
2-way interaction on gym membership WTP ($F(1,112) = 5.91, p < .05$).  
**Simple Contrasts:**  
Control condition, low (vs. high) norm: ($M = 18.12$ vs. 25.56, $F(1,112) = 3.04, p < .10$)  
Improvement condition, low (vs. high) norm: ($M = 21.00$ vs. 14.04, $F(1,112) = 2.86, p < .10$). |
| Study 2 | Static x Dynamic x Implicit Theory interaction on fitness app WTP ($b = 1.93, t = 2.05, p < .05$).  
**Simple Interactions and Simple-Simple Effects:**  
At mean -1 SD (entity theorists):  
2-way interaction ($b = -4.37, t = -3.35, p < .01$); slope of static information in control condition ($b = -1.92, t = 2.60, p < .05$); Slope of static information in improving condition ($b = -2.45, t = -2.28, p < .05$)  
At mean +1 SD (incremental theorists):  
2-way interaction ($b = -0.46, t = -.40, NS$)  
3-way interaction on gym membership WTP ($b = 16.25, t = 1.77, p < .10$).  
**Simple Interactions and Simple-Simple Effects:**  
At mean -1 SD (entity theorists):  
2-way interaction ($b = -32.00, t = -2.60, p < .05$); slope of static information in control condition ($b = 14.92, t = 2.14, p < .05$); Slope of static information in improving condition ($b = -17.07, t = -1.68, p < .10$)  
At mean +1 SD (incremental theorists):  
2-way interaction ($b = -0.02, t = -.002, NS$) |
Figure 1: Fitness App WTP (Study 2)

![Graph showing willingness to pay for fitness app across different levels of exercise time and entity conditions.]

**Honor Code Statement**

The authors declare that the presenting author does not plan to present in more than one other special session or competitive paper submission, the submission has not been sent into multiple tracks, the submission has not been presented previously at ACR, and the submission has not been published in any journal.