Clarifying the Contribution of Subjective Norm to Predicting Leisure-Time Exercise

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Objective: To clarify the contribution of subjective norm to exercise intention and behavior by considering the influence of descriptive as well as injunctive social norms related to family and friends. 

Methods: A sample of 530 college students completed a questionnaire that assessed descriptive and injunctive social norms related to family and to friends, perceived behavioral control, attitude, intention, and leisure-time exercise.

Results: Friend descriptive social norm was a significant predictor of both intention (p<.05) and leisure-time exercise (p<.001). Conclusion: Descriptive norms should be incorporated into tests of the theory of planned behavior in the exercise domain.

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Surveys conducted in the United States indicate that the majority of the population is essentially sedentary, reporting little or no exercise of even low to moderate intensity. This is important because significant physical and emotional benefits can be derived from exercise of moderate intensity and from short bouts of physical activity throughout the day. Although most people are aware that exercise is good for them, they often remain sedentary. Therefore, it is not surprising that several theoretical accounts of motivation have been employed to examine the determinants of physical activity. One of the main theoretical frameworks used to investigate motivation to exercise is the theory of planned behavior. In the present study, hypotheses were tested regarding the contribution of descriptive norms to leisure-time exercise within the context of the theory of planned behavior.

The Theory of Planned Behavior

The theory of planned behavior was designed to account for the antecedents of intent and behavioral choice when individuals perceive that they have only partial volitional control over their actions. Relative to other health behaviors such as taking vitamin supplements and avoiding caffeine, college students perceive that they have less control over exercising regularly. This theory posits that intent is a function of 3 determinants—attitude, subjective norm, and perceived behavioral control. These 3 determinants, in turn, are hypothesized to exert indirect effects on behavioral choice via intent. Intent is conceptualized as the most proximal determinant of behavioral choice. In addition, perceived behavioral control is hypothesized to exert a direct effect on behavioral choice.

Attitude refers to the extent to which an individual has a favorable or unfavorable evaluation of a specific course of
action. Subjective norm is a social factor referring to the perceived social pressure to perform or not to perform the behavior. Perceived behavioral control refers to the perceived ease or difficulty of carrying out a certain action, and it is assumed to reflect past experience as well as anticipated impediments and obstacles. Intentions are proposed to capture the extent to which an individual is motivated to engage in the behavior.

The theory of planned behavior makes 2 predictions regarding actions that individuals perceive as being only partially under their volitional control: (a) Attitude, subjective norm, and perceived behavioral control exert independent effects on intent; and (b) intent and perceived behavioral control exert independent effects on behavior.

Applications of the Theory of Planned Behavior to Exercise

Several narrative and quantitative reviews have examined the utility of theory of planned behavior in the exercise domain. In a meta-analysis, Hausenblas, Carron, and Mack reported that the mean correlations between attitude, perceived behavioral control, and subjective norm and intent were .52, .43, and .27, respectively. Note that, although subjective norm was significantly correlated with intent, the magnitude of the correlation between subjective norm and intent was considerably smaller than the magnitude of the correlations between attitude and intent and perceived behavioral control and intent. Hausenblas, Carron, and Mack found that the mean correlations between intent, attitude, perceived behavioral control, and subjective norm and exercise behavior were .47, .39, .45, and .09, respectively. Once again, the magnitude of the correlation between subjective norm and exercise behavior was much smaller than the magnitude of the correlations between exercise behavior and the other variables derived from the theory of planned behavior.

Godin and Kok examined regression coefficients that more directly test the predictions derived from the theory of planned behavior regarding exercise. They concluded that (a) attitude and perceived behavioral control were often significant predictors of intent; (b) subjective norm was less likely than attitude and perceived behavioral control to be a significant predictor of intent, and furthermore, when it was significant, the regression coefficient for subjective norm was smaller than the regression coefficients for attitude and perceived behavioral control; (c) intent was a strong predictor of exercise behavior; and (d) perceived behavioral control was a significant predictor of exercise behavior in about half of the studies. Thus, of the 5 predictions regarding intent and exercise behavior that can be derived from the theory of planned behavior, 3 have received strong empirical support (attitude as a predictor of intent, perceived behavioral control as a predictor of intent, and intent as a predictor of exercise behavior), one has received moderate empirical support (perceived behavioral control as a predictor of exercise behavior), and one has received weak empirical support (subjective norm as a predictor of intent).

The failure of subjective norm to significantly predict intent in the exercise domain was replicated in 2 recent studies. Courneya, Plotnikoff, Hotz, and Birkett found that whereas social support was a significant predictor of both intent and exercise stage, subjective norm was not a significant predictor of either variable. They concluded that (p. 300) "if [these] findings are replicated the theory of planned behavior should consider replacing subjective norm with social support."

Before subjective norm is discarded from applications of the theory of planned behavior in the exercise domain, it is important to consider at least 2 explanations for the inability of subjective norm to predict intent. One possibility is that the relation between subjective norm and intent is moderated by other variables. This notion was tested by Chatzisarantis and Biddle, who examined the relation between subjective norm and intent separately for participants who were (a) ex-
The Godin Leisure-Time Exercise Questionnaire was included in the battery.

Intrinsically motivated to exercise and (b) intrinsically motivated to exercise. On the one hand, for the extrinsically-motivated-to-exercise group, intent to exercise increased as subjective norm increased, and on the other hand, for the intrinsically-motivated-to-exercise group, intent to exercise decreased as subjective norm increased.

A second possibility—and the one that is investigated in the present study—is that the relations between subjective norm and exercise intention and behavior vary with the type of subjective norm that is assessed. Researchers studying social norms have distinguished between injunctive and descriptive social norms. Injunctive social norms refer to what other people ought to do (i.e., they are prescriptive) whereas descriptive social norms refer to what other people actually do (i.e., they are behavioral). Reno, Cialdini, and Kallgren demonstrated that, on the one hand, injunctive social norms may be more useful for decreasing antisocial behavior and that, on the other hand, descriptive social norms may be more useful for increasing prosocial behavior. Although exercise is not a prosocial behavior, it is a positive behavior, and therefore, intent to exercise may be influenced more strongly by descriptive than injunctive social norms. Furthermore, given that individuals perceive that they have only partial volitional control over exercise, descriptive norms, which convey information about what other people are doing, may exert a greater influence on exercise behavior than injunctive norms.

In assessing subjective norm in the exercise domain, researchers typically have asked whether important others (a) think that one should exercise, (b) approve of one's exercising, (c) support one's exercising, and (d) pressure one to exercise. For example, Ajzen and Driver used the following 2 items to assess subjective norm: "Most people who are important to me approve/disapprove of my engaging in jogging," and "Most people who are important to me think I should engage in jogging." Thus, the measurement of subjective norm in the exercise domain has focused on injunctive, as opposed to descriptive, social norms.

Godin and Kok suggested that the contribution of subjective norm to predicting intent to exercise might be enhanced by incorporating the assessment of descriptive norms. In the present study, we assessed both injunctive and descriptive norms. These norms were assessed separately for friends and family members because research on physical activity suggests that it is important to take into account the source of social influence. We tested the following two hypotheses: (a) Descriptive norm scores would be significant, positive predictors of intent to exercise; and (b) descriptive norm scores would be significant, positive predictors of leisure-time exercise.

**METHOD**

**Sample**

A sample of college students was drawn for the present study from 2,276 students enrolled in sections of Introduction to Psychology at a large southwestern state university. During the second week of classes in the Fall 2000 semester, students enrolled in Introduction to Psychology were administered a battery of measures. Students completed this battery as a prelude to participating in studies that could be used to fulfill a course requirement. The Godin Leisure-Time Exercise Questionnaire was included in the battery.

Starting at the fourth week of the semester, we recruited 530 students from sections of Introduction to Psychology to participate in a study of life goals and physical activity. Students participated in this study to earn credit hours that enabled them to fulfill a course requirement. Among the participants in our study, 68% were women. Seventy-two percent of the participants in the present study were white, non-Hispanic, 8% were Hispanic, 5% were Asian, 5% were African American, and the remaining 10% of the participants were of other ethnicities or were of mixed heritage. Forty-one percent of the participants in our study were younger than 18 years old, 38% were
18 years old, 13% were 19 years old, and the remaining 8% were 20 years old and older.

To ascertain whether our sample was biased with respect to exercise participation, we used the Godin leisure-time exercise scores (see below for a description of this index) derived from the battery that was administered to almost all students enrolled in Introduction to Psychology. The difference between the mean Godin leisure-time exercise scores of students who participated in our study (M=18.81) and those that did not (M=18.43) was not significant, t(2,074) = 0.74, p>.05.

Procedure
Students who agreed to participate were administered a survey that included measures of life goals, leisure-time exercise, and the variables derived from the theory of planned behavior.

Measures
The major variables in the theory of planned behavior—intent, attitude, perceived behavioral control, and subjective norm—were all measured on 7-point scales (anchor ratings were 0 and 6). With the exception of descriptive norm, these variables were measured using items adapted from Ajzen and Driver.6

Perceived behavioral control. Perceived behavioral control was measured with 2 items. Students were asked (a) whether they have the resources required to engage in exercise and (b) if it is easy for them to engage in exercise. The anchor points for the ratings were strongly disagree and strongly agree. The correlation between these items was .37, and internal consistency reliability for this scale, as estimated by coefficient alpha, was .53. Scale scores were formed by averaging the responses to the 2 items. Higher scores indicate greater perceived control over engaging in exercise.

Attitude. Ten adjective pairs were used to assess attitude. The 10 adjective pairs were harmful-beneficial, useless-useful, weak-strong, passive-active, foolish-wise, boring-interesting, unenjoyable-enjoyable, unpleasant-pleasant, bad-good, and undesirable-desirable. Different anchor points were used for each item. For example, for the harmful-beneficial item, the anchor points were very harmful and very beneficial. The internal consistency reliability for this scale, as estimated by coefficient alpha, was .88.

Scale scores were formed by averaging the responses to the 10 items. Higher scores indicate a more favorable attitude toward exercise.

Injunctive norms related to family members and friends. To assess injunctive norms, students were asked (a) whether their family members feel that they ought to engage in exercise at least 3 times a week and (b) whether their friends feel that they ought to engage in exercise at least 3 times a week. The anchor points for the ratings were strongly disagree and strongly agree. Higher scores indicate students' perceptions that family members and friends feel that they should exercise at least three times a week.

Descriptive norms related to family members and friends. The authors developed a measure of descriptive norm for the present study. Students were asked (a) whether most of their family members engage in exercise at least 3 times a week and (b) whether most of their friends engage in exercise at least 3 times a week. The anchor points for the ratings were strongly disagree and strongly agree. Higher scores indicate that students perceive that family members and friends exercise at least 3 times a week.

Intent. To assess intent, students responded to 2 items: (a) "I plan to engage in exercise during the next 6 months" and (b) "I will try to engage in exercise during the next 6 months." The anchor points for the first item were not at all and frequently and the anchor points for the second item were not at all and very much. A 6-month time frame was employed because it has been used in previous applications of the theory of planned behavior and the stage-of-change model to the exercise domain.6,22 The correlation between these items was .77, and internal consistency reliability for this scale, as estimated by coefficient alpha, was .87. Scale scores were formed by averaging the responses to the 2 items. Higher scores indicate that students intend to
Predicting Leisure-time Exercise

<table>
<thead>
<tr>
<th>TABLE 1</th>
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<tbody>
<tr>
<td>Descriptive Statistics and Correlations among the Study Variables (N=530)</td>
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</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<tbody>
<tr>
<td>Leisure-Time Exercise (1)</td>
<td>.31***</td>
<td>.37***</td>
<td>.28***</td>
<td>.04</td>
<td>.10*</td>
<td>.17***</td>
<td>.33***</td>
<td></td>
</tr>
<tr>
<td>Intention (2)</td>
<td>.50***</td>
<td>.52***</td>
<td>.12**</td>
<td>.13**</td>
<td>.15**</td>
<td>.28**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Behavioral Control (3)</td>
<td>.53***</td>
<td>.09</td>
<td>.07</td>
<td>.23***</td>
<td>.37***</td>
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<td>Attitude (4)</td>
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<td>.20***</td>
<td>.17***</td>
<td>.25***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Injunctive Norm (5)</td>
<td>.68***</td>
<td>.31***</td>
<td>.20***</td>
<td></td>
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<tr>
<td>Friend Injunctive Norm (6)</td>
<td>.18***</td>
<td>.36***</td>
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<td></td>
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<tr>
<td>Family Descriptive Norm (7)</td>
<td>.32***</td>
<td></td>
<td></td>
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<tr>
<td>Friend Descriptive Norm (8)</td>
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<td></td>
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</tbody>
</table>

M: 19.76 5.38 4.72 4.90 3.22 2.86 3.00 3.45
SD: 9.19 1.01 1.11 0.78 1.97 1.97 1.88 1.69

Note. *p<.05; **p<.01; ***p<.001

exercise

Leisure-Time exercise. The Godin Leisure-Time Exercise Questionnaire was used to assess leisure-time exercise. The instructions for the questionnaire were as follows: "Considering a typical 7-day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time?" Participants answered this question with respect to (a) strenuous exercise, (b) moderate exercise, and (c) light exercise. The description that accompanied strenuous exercise was "heart beats rapidly (ie, running, jogging, hockey, football, soccer, squash, basketball, x-country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)." The description that accompanied moderate exercise was "not exhausting (ie, fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)." The description that accompanied light exercise was "mininal effort (ie, yoga, archery, fishing from river bend, bowling, horseshoes, golf, snow-mobiling, easy walking)."

Participants indicated their weekly frequencies on a 9-point scale ranging from 0 (never) to 8 (8 times or more a week). The questions were scored by multiplying the weekly frequencies by the corresponding MET (Measurement in Exercise Testing) value of 9 for strenuous exercise, of 5 for moderate exercise, and of 3 for light exercise. These 3 scores were averaged to obtain a total leisure-time exercise score. Because the anchor point at the high end of the weekly frequency scale was "8 or more times a week," we slightly underestimated the central tendency and variability in the distribution of total leisure-time exercise scores. Higher scores indicate that during a typical week students engaged in exercise more frequently and/or in more strenuous types of exercise.

A summary of test-retest reliability and validity studies indicates that the Godin Leisure-Time Exercise Questionnaire has adequate psychometric properties for a brief measure of exercise. Participants in the present study completed the Godin Leisure-Time Exercise Questionnaire on 2 occasions--as part of the battery administered during the second week of the semester and as part of the survey that we administered 2 to 6 weeks later. The test-retest correlation was .60, indicating that there is moderate stability over several weeks in self-reports of physical activity as assessed by the Godin Leisure-Time Exercise Questionnaire. All subsequent analyses involved scores from the second administration of the Godin Leisure-Time Exercise Questionnaire.

RESULTS

Preliminary Analysis
Prior to testing our hypotheses we ex-
TABLE 2
Summary of Hierarchical Regression Analysis Predicting Intent Scores (N=530)

<table>
<thead>
<tr>
<th>Step/Predictor</th>
<th>$R^2_{change}$</th>
<th>$F_{change}$</th>
<th>df</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Perceived Behavioral Control</td>
<td>.25</td>
<td>180.00***</td>
<td>1,528</td>
<td>.29***</td>
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<tr>
<td>2. Attitude</td>
<td>.09</td>
<td>70.90***</td>
<td>1,527</td>
<td>.34***</td>
</tr>
<tr>
<td>3. Family Injunctive Norm</td>
<td>.00</td>
<td>0.71</td>
<td>1,526</td>
<td>.02</td>
</tr>
<tr>
<td>4. Friend Injunctive Norm</td>
<td>.00</td>
<td>0.59</td>
<td>1,525</td>
<td>-.00</td>
</tr>
<tr>
<td>5. Family Descriptive Norm</td>
<td>.00</td>
<td>0.05</td>
<td>1,524</td>
<td>-.01</td>
</tr>
<tr>
<td>6. Friend Descriptive Norm</td>
<td>.01</td>
<td>4.65*</td>
<td>1,523</td>
<td>.09*</td>
</tr>
</tbody>
</table>

Note. $\beta$s are standardized partial regression coefficients with all predictors in the model.
*p<.05; ***p<.001

amined the descriptive statistics and correlations among the variables. As can be seen in Table 1, in general, respondents reported relatively strong intent, attitude and perceived behavioral control and moderate social norms. The strongest correlates of intent were attitude (r=.52) and perceived behavioral control (r=.50). Among the subjective norm variables, friend descriptive norm exhibited the largest association with intent (r=.28). Perceived behavioral control was the strongest correlate of leisure-time exercise (r=.37), followed by friend descriptive norm (r=.33), and intent (r=.31). The correlations among perceived behavioral control, attitude, and the subjective norm variables ranged from .07 (perceived behavioral control with friend injunctive norm) to .68 (family injunctive norm with friend injunctive norm).

### Predicting Intent

The 2 hypotheses were tested with hierarchical multiple regression. In both analyses, we entered one variable at each step in the model. In predicting intent, the variables were entered in the following order: perceived behavioral control, attitude, family injunctive norm, friend injunctive norm, family descriptive norm, and friend descriptive norm. The results are summarized in Table 2.

Consistent with the theory of planned behavior, both intent and perceived behavioral control were significant predictors at the time that they were entered and with all variables in the model. Although family descriptive norm was a significant predictor when it was entered into the model (p<.05), it was not significant (p>.18) after friend descriptive norm was included in the model. With all variables in the model, among the subjective norm variables, only friend descriptive norm significantly (p<.001) predicted leisure-time exercise. Friend descriptive
TABLE 3
Summary of Hierarchical Regression Analysis Predicting Leisure-time Exercise (N=530)

<table>
<thead>
<tr>
<th>Step/Predictor</th>
<th>R²_change</th>
<th>F_change</th>
<th>df</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Intention</td>
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<td>57.17***</td>
<td>1,528</td>
<td>.12*</td>
</tr>
<tr>
<td>2. Perceived Behavioral Control</td>
<td>.06</td>
<td>38.14***</td>
<td>1,527</td>
<td>.20**</td>
</tr>
<tr>
<td>3. Attitude</td>
<td>.00</td>
<td>2.04</td>
<td>1,526</td>
<td>.07</td>
</tr>
<tr>
<td>4. Family Injunctive Norm</td>
<td>.00</td>
<td>0.05</td>
<td>1,525</td>
<td>-.08</td>
</tr>
<tr>
<td>5. Friend Injunctive Norm</td>
<td>.00</td>
<td>3.52</td>
<td>1,524</td>
<td>.03</td>
</tr>
<tr>
<td>6. Family Descriptive Norm</td>
<td>.01</td>
<td>5.61*</td>
<td>1,523</td>
<td>.06</td>
</tr>
<tr>
<td>7. Friend Descriptive Norm</td>
<td>.03</td>
<td>16.56***</td>
<td>1,522</td>
<td>.19***</td>
</tr>
</tbody>
</table>

Note. βs are standardized partial regression coefficients with all predictors in the model.
*p<.05; **p<.01

norm accounted for 3% of the variance in leisure-time exercise scores, above and beyond the other 6 predictor variables. With all variables in the model, the strongest predictors of leisure-time exercise, in descending order, were perceived behavioral control (β=.20), friend descriptive norm (β=.19), and intent (β=.12). Thus, leisure-time exercise scores increased as perceived behavioral control, friend descriptive norm, and intent increased. Once again, paralleling previous studies, family and friend injunctive norms were not significant predictors of leisure-time exercise. In concert, the 7 variables accounted for 20% of the variation in leisure-time exercise scores, F(7,522) = 18.84, p<.001.

Table 1 depicts the variables that had significant (p<.05) effects on intent and on leisure-time exercise. Attitude, perceived behavioral control, and friend descriptive norm exhibited significant effects on intent. Perceived behavioral control, friend descriptive norm, and intent, in turn, exerted significant direct effects on leisure-time exercise.

Comparison of the Indirect and Direct Effects of Friend Descriptive Norm
Given that friend descriptive norm was a significant predictor of intent and given that intent and friend descriptive norm were both significant predictors of leisure-time exercise, we computed the indirect effect for friend descriptive norm. This was done by multiplying the beta for the path from friend descriptive norm to intent (.09) by the beta for the path from intent to leisure-time exercise (.12). Thus, the indirect effect for friend descriptive norm equaled .01. From Figure 1 and Table 3, it can be seen that the direct effect for friend descriptive norm was .19. By adding the indirect and direct effects for friend descriptive norm, we obtained its total effect of .20 (.01 + .19). Thus, 95% of the total effect of friend descriptive norm was direct ([.19/.20] x 100), and only 5% was indirect ([.01/.20] x 100).

DISCUSSION
The impetus for the present study was the consistent finding that subjective norm does not significantly predict intent in the exercise domain. Extrapolating from this finding, Courneya, Plotnikoff, Hotz, and Birkett recommended that social support replace subjective norm in research using the theory of planned behavior to study the dynamics of intent and exercise behavior. Godin and Kok suggested that behavioral or descriptive norms may be more important than prescriptive or injunctive norms in the exercise domain. The aim of the present study was to clarify the contribution of subjective norm to predicting exercise intention and behavior by considering the influence of descriptive as well as injunctive social norms related to family and friends.

In support of our first prediction, friend descriptive norm was found to be a significant, positive predictor of intent scores. It should be noted that, with the other 5
predictors in the model, the net $R^2$ associated with friend descriptive norm was only .01. Furthermore, with all variables in the model, the beta weight for friend descriptive norm ($\beta=.09$) clearly was much smaller than the beta weights for attitude ($\beta=.34$) and perceived behavioral control ($\beta=.29$). Thus, friend descriptive norm exerted a comparatively small effect on intent. Martocchio and Harrison\textsuperscript{24} contend that intention represents the motivational conduit through which attitude, perceived behavioral control, and subjective norm converge to influence engaging in a particular course of action. The findings of the present study suggest that friend descriptive norm does not have much of an influence on motivation to engage in exercise. Given this finding, how does friend descriptive norm exert a substantial impact on the dynamics of exercise? To address this question, we discuss our findings with respect to our second hypothesis.

In support of our second prediction, friend descriptive norm was a significant, positive predictor of leisure-time exercise. It should be noted that, with the other 6 predictors in the model, the net $R^2$ associated with friend descriptive norm was .03. More impressively, with all of the predictors in the model, the beta weight for friend descriptive norm ($\beta=.19$) was larger than the beta weight for intent ($\beta=.12$) and was comparable to the beta weight for perceived behavioral control ($\beta=.20$). Thus, friend descriptive norm exerted a moderate effect on leisure-time exercise. Whereas the magnitude of the indirect effect of friend descriptive norm was only .01, its direct effect was .19.

Thus, the effect of descriptive friend norm in the present study was mostly direct. Gollwitzer\textsuperscript{50} has suggested that whereas intentions capture the decisional or motivational component of action, they do not tap the implemental component of action. In other words, during the motivational phase, an individual decides to perform a behavior, whereas during the volitional phase, an individual makes specific plans to ensure that the decision is acted upon. The findings of the present study suggest that friend descriptive norm exerted most of its effect on the volitional, as opposed to motivational, component of engaging in leisure-time exercise. As described below, having friends who exercise may increase an individual's engagement in exercise because they (a) provide companionship during exercise, (b) support exercise behavior, and (c) exert social control over engaging in exercise.\textsuperscript{20}

Interestingly, the effect of descriptive norm was observed for friends but not for family members. One possibility is that this effect is due to the nature of our sample. A developmental task in late
Companionship refers to pleasurable social interaction with others.

adolescence is to achieve autonomy from parents. Thus, in late adolescence, the social influence of peers may exceed the social influence of parents in the domain of exercise. Moreover, for undergraduates who have moved away from home, the social influence of family members on exercise behavior may be attenuated by the lack of proximity.

Several other findings in the present study are consistent with previous research. More specifically, attitude and perceived behavioral control were significant predictors of intent, subjective norm as assessed by injunctive social norms did not predict intent, and intent and perceived behavioral control were significant predictors of leisure-time exercise. We were thus able to explain 35% of the variation in intent and 20% of the variation in leisure-time exercise.

In the present study, friend descriptive norm was assessed by asking respondents to agree or disagree with the statement that most of their friends engage in exercise at least 3 times a week. An important direction for future research, beyond replicating the findings of the present study, would be to identify the mechanism(s) by which friend descriptive norm influences leisure-time exercise by college students. Rook and Ituarte point out that many friendships involve control, companionship, and support. Chatzisarantis and Biddle maintain that social norms tap into the controlling dimension of personal relationships. Social control refers to direct attempts by others to influence an individual. Friends who exercise may exert more social control over participation in exercise than friends who do not exercise. Thus, the effect of friend descriptive norm on leisure-time exercise may be mediated by social control.

Companionship refers to pleasurable social interaction with others. Individuals who have friends who exercise have the opportunity to engage in leisure-time exercise with them. According to this notion, individuals who exercise with friends, relative to those who do not, experience greater enjoyment from their leisure-time exercise and thus are willing to exercise more frequently. Thus, the effect of friend descriptive norm on leisure-time exercise may be mediated by companionship.

Social support refers to the comfort, assistance, and information one receives through formal and informal contacts with others. Researchers have also begun to explore how social negativity (eg, criticism) can affect leisure-time exercise. Chogahara showed that both social support and social negativity influenced the physical activity of older adults. Possibly, as compared with individuals who do not have friends who exercise, individuals with friends who exercise receive more social support and less social negativity regarding engaging in exercise. Thus, social support and social negativity may mediate the effect of friend descriptive norm on leisure-time exercise. By examining the relations among descriptive norms, social control, social support, companionship, intent, and behavior, we can expand the theory of planned behavior as applied to the exercise domain and increase our understanding of the dynamics of participation in exercise.

The present study had several limitations. First, our measures of friend and family injunctive and descriptive norms consisted of single items. By developing multiple-item instruments, scale reliability and other psychometric properties can be assessed, and the data can be analyzed using structural equation modeling. Second, our findings are limited by the correlational and cross-sectional nature of our analyses. Third, our findings are based upon a sample from one university and thus may not generalize to other colleges and universities and to nonstudent populations.

In summary, the present study suggests that it is premature to eschew using subjective norm in research applying the theory of planned behavior to the exercise domain. Instead of replacing subjective norm with social support, we advocate examining the relations among descriptive norms, social control, companionship, social negativity, social support, and leisure-time exercise in the context of the theory of planned behavior.
Furthering our understanding of how social influences impact leisure-time exercise will provide important information for the design of exercise interventions derived from the theory of planned behavior.

REFERENCES


