Differentiated Roles of Social Encouragement and Social Constraint on Physical Activity Behavior

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ABSTRACT

Background: *Social support is, in general, positively associated with exercise behavior. However, social influence may not always be helpful and may sometimes lead to obligation or a sense of intrusion rather than encouragement or assistance.* ***Purpose:*** *The objective was to determine relationships among different types of social influence (social encouragement and social constraint) and exercise motivation and exercise behavior.* ***Method:*** *Structural equation modeling was used to investigate relationships among exercise and social influence variables.* ***Results:*** *A model was found to fit the data well in which social encouragement had an indirect association with exercise behavior through motivational variables. Social constraint was associated with only one aspect of exercise motivation—"have to," or obligatory, commitment—and had no direct or indirect association with exercise behavior.* ***Conclusions:*** *These findings emphasize the importance of social influences that promote desirable behaviors in contrast to those that pose constraints on the failure to perform desirable behaviors.*

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INTRODUCTION

Social influence and support have been widely studied yet poorly understood in health psychology. One type of social influence, social support, has been associated with various physical and mental health outcomes. Social support has been related to both reduced all-cause mortality and reduced mortality due to specific diseases such as cancer and heart disease (1). Social support has also been associated with improved immune function, quicker recovery following surgery, and psychological adjustment in individuals with chronic disease (2,3). Furthermore, numerous studies have found social influence to be fundamental in the maintenance of various health behaviors, such as chronic disease self-management (4), smoking cessation (5), and weight loss (6).

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Social influence has also been studied as a means of explaining and predicting physical activity. In previous studies, two types of social influence have been assessed: general social influence and social influence specific to physical activity. In a study assessing the relationship between general social influence and physical activity behavior, the number of friends or family members and the frequency of social contact were positively associated with higher physical activity levels (7). Familial structure (i.e., being married and having children), however, was associated with lower levels of physical activity. Although this study showed a link between general social influence and physical activity behavior, it focused on the quantity of social networks and not on the quality or type of support.

Eyler and colleagues compared women with various levels of exercise-specific social support on multiple measures of physical activity behavior (8). These included leisure-time physical activity and total physical activity, which is a sum of leisure time, household activity, and occupational physical activity. When compared with women who reported no or low perceived support, individuals with medium or high perceived support were less likely to be sedentary and more likely to accumulate 150 min of leisure-time physical activity and 300 min of total physical activity per week. Social support, however, had no influence on regular exercise, defined as participating in leisure-time physical activity at least 5 days a week for 30 min a session. These researchers suggested that exercise-specific social support may provide the initial motivation to increase physical activity and may be more important for moderate activity than for regularly sustained physical activity.

Physical activity intervention studies have revealed inconsistent results on the relationship between social support and physical activity behavior. Baseline perceptions of both general and exercise-specific social support have been found to predict exercise behavior at 3 months into an exercise program (9,10). However, at 12 months into an exercise program, current exercise-specific social support predicted exercise behavior, whereas baseline levels of exercise-related social support and general social support did not (10). In an intervention study with older adults, neither baseline levels of exercise-specific social support from family, friends, and exercise classmates nor changes in exercise-related social support were related to exercise adherence at 7 and 12 months into the program (11).

A meta-analysis assessing the impact of social influence on exercise found social influence to be positively associated with exercise behavior, exercise intentions, and attitudes associated with the exercise experience (12). In addition, support from nonfamilial important others (e.g., physicians, work colleagues) was found to have a stronger influence on exercise behavior than support from family members. Although this meta-analysis provided evidence for a relationship between social influence, exercise motivation, and exercise behavior, it was unknown how all of these factors were linked and whether all types of social influence benefited exercise motivation and behavior. Regarding the former, Eyler and colleagues suggested that social support may be influencing motivational variables, which in turn may influence actual exercise behavior (8).

Taken together, these studies suggest a need for greater understanding of how social influence is related to health behavior change, particularly exercise behavior. Among many possibilities for pursuing such understanding of the effects of social influence, our study pursued two: (a) determining the motives that mediate the influence of social encouragement on exercise and (b) distinguishing between social encouragement and social constraint.

Regarding the distinction among types of social influence, it is now known that social influence is not always helpful and in some cases may result in negative consequences. For example, in studies assessing the relationship between social influence and coping, supportive behavior was associated with adaptive coping strategies, whereas criticism and contentious social interactions were associated with maladaptive coping strategies (13,14). In addition, marital satisfaction has been associated with positive affect, whereas marital tension has been associated with negative affect (13). Furthermore, high levels of family criticism and overinvolvement have been associated with relapses in depression and schizophrenia (15,16).

In the area of physical activity promotion, few studies have assessed whether social influence may be counterproductive or result in negative consequences. A majority of studies focused on the benefits of positive social support or social encouragement, whereas few assessed the impact of social constraint, defined as "social expectations or norms that create feelings of obligation to remain in an activity" (17), on physical activity behavior. Although a friend, expert, or significant other may be viewed as being supportive, the support provided may cause the receiver to feel obliged to behave in a certain manner. Thus, social influence may lead to obligation or a sense of intrusion rather than encouragement or assistance. This interaction may cause an individual to exercise out of concerns about how others will evaluate him or her if no exercise is completed, rather than because the individual desires to exercise. Duncan and colleagues expressed a similar viewpoint in their report that high levels of guidance or authoritative support may be related to decreased participation in an exercise program (18).

To better understand how social influence is related to physical activity behavior, this study examined the relationships among social influence, exercise motivation, and exercise behavior. Two types of social influence—social encouragement and social constraint—were examined to determine if they were differentially related to exercise motivation and exercise behavior. Exercise motivation and exercise behavior were operationalized by several measures. Motivational variables included "want to" (enthusiastic) commitment, "have to" (obligatory) commitment, and enjoyment/satisfaction. Exercise behavior was measured as the total volume of exercise completed in the previous week, stage of behavior change, and investment in exercise. When comparing the influence of social support and social encouragement on exercise motivation, we expected social encouragement to be related more closely to want to commitment and social constraint to be related more closely to have to commitment. In addition, we expected social encouragement and want to commitment to be stronger predictors of the three measures of exercise behavior than social constraint and have to commitment.

METHOD

Participants

Participants were recruited in person from university classes (50.0%), campus organizations (21.3%), health clubs (21.7%), and a running club (7.0%). These recruitment sources were chosen to ensure inclusion of individuals with varying levels of physical activity behavior. In sum, 267 participants enlisted in this study. Of these participants, 14 failed to complete all items on the questionnaire and therefore were disqualified from analyses, and another 6 were removed because they were extreme multivariate outliers. In addition, only 3 individuals were found to be in the precontemplation stage for exercise, so rather than combine this stage with the contemplation stage, these individuals were omitted from analyses. As such, 244 participants supplied data that were used in analyses.

Participants ranged in age from 18 to 79 years ($M = 26.80$, $SD = 13.67$), and 64% were female. The ethnic/racial makeup of the sample was 72.8% White, 16.5% African American, 4.1% Hispanic, 3.3% Asian American, 0.8% Native American, and 2.5% other.

Participants tended to be active and had a mean exercise volume of 50.08 kcal/kg/week ($SD = 44.50$) and a median exercise volume of 46.00 kcal/kg/week. Over half ($n = 127$, 52.0%) were categorized as being in the maintenance stage of exercise behavior change. Others were classified as being in contemplation ($n = 26$, 10.7%), preparation ($n = 56$, 23.0%), or action ($n = 35$, 14.3%) stages.

Procedures

All procedures were approved by the Institutional Review Board for Human Subjects at the University of North Carolina at Greensboro. Participants were informed of their confidentiality and the voluntary nature of the study. Participants received a basic demographic questionnaire along with questionnaires about physical activity behavior and attitudes toward exercise. The questionnaires took approximately 15 to 25 min to complete. Participants returned questionnaires to the investigator upon completion.

Measures

Social influence. Subscales from the Exercise Commitment Scale (ECS) (19) were used to assess social encouragement and social constraint. Participants responded to questions using a 10-point scale ranging from 1 (*not at all true for me*) to 10 (*completely true for me*). Social encouragement was measured using the Social Support subscale of the ECS. Although this subscale was labeled *Social Support*, the three items on this subscale ("People important to me support my exercising"; "People important to me encourage me to exercise"; "People important to me think that it is ok that I exercise") appeared to measure one aspect of social support: social encouragement. As such, the term *social encouragement* is used when describing this measure.

The Social Constraint subscale assessed how others would evaluate the exerciser if he or she did not exercise. This subscale included four items: "People will be disappointed in me if I quit exercising"; "I have to keep exercising to please others"; "People will think I am a quitter if I stop exercising"; and "I feel pressure from other people to exercise." In this study, these subscales demonstrated satisfactory levels of internal consistency with alpha levels for subscales as follows: Social Encouragement (.78) and Social Constraint (.83).

Exercise motivation. Three measures of exercise motivation were used in this study: Want to Commitment, Have to Commitment, and Enjoyment/satisfaction. Two dimensions of commitment—want to (enthusiastic) commitment and have to (reluctant or obligatory) commitment—were measured by subscales of the ECS in the same manner mentioned previously. Enjoyment/satisfaction was measured by a combination of items forming the Satisfaction subscale of the ECS (i.e., "I find exercise to be very rewarding") and items adapted from the enjoyment construct of the Sport Commitment Model (20). The added items included "I enjoy exercising," "I am happy when exercising," "I have fun exercising," and "I like exercising." These subscales demonstrated satisfactory levels of internal consistency with alpha levels as follows: Want to Commitment (.96), Have to Commitment (.85), and Enjoyment/satisfaction (.91).

Exercise behavior. Three measures were used to capture different dimensions of exercise behavior: Stages of Exercise Behavior Change (SEBC) (21), Physical Activity Recall (22), and the Investments subscale of the ECS. Current stage of exercise behavior change was measured using the SEBC. The SEBC asked participants to respond *true* or *false* to a series of five items. From these responses, individuals were categorized into one of the following five stages. The precontemplation stage included participants who did not exercise and did not intend to start exercising. The contemplation stage included participants who did not exercise but intended to start exercising in the next 6 months. The preparation stage included participants who exercised some but not regularly (*regular exercise* was defined as exercising three or more times a week for 20 min or longer). The action stage included participants who exercised regularly but had done so for less than 6 months. The maintenance stage included participants who exercised regularly and had done so for at least 6 months. The SEBC has been found to have a kappa index of reliability of .78 over a 2-week period (21).

Total exercise was measured using the Physical Activity Recall (22). Although this questionnaire was originally developed in an interview format, it has also been used in a self-administered written format with the hard and very hard activity constructs combined to represent vigorous activity (23). In our study, participants were provided with a list of several moderate and vigorous physical activities. Participants indicated the number of hours they engaged in each activity during the previous 7 days. Participants also had the option to add activities that were not on the list. Occupational and household activities were ignored, and only hours of planned, structured leisure activity were used for calculations of total exercise. The number of hours of activity in each intensity category (moderate or vigorous) was multiplied by the metabolic equivalent value for that category, and then the two categories were summed to provide a value of total exercise in kilocalories per kilogram.

The amount of time, energy, effort, and money put into exercise was measured using the Investments subscale of the ECS. This subscale consisted of four items, such as "I have invested a lot of time into exercising" and "I have invested a lot of energy into exercising." The Investments subscale showed a satisfactory level of internal consistency ($\alpha = .92$).

Statistical Analyses

Correlation analyses were conducted to determine the relationships among social encouragement, social constraint, enjoyment/satisfaction, want to commitment, have to commitment, total exercise, investments, and stage of exercise behavior change. Two-tailed tests with an alpha level set at .05 were used for all analyses.

Structural equation modeling was employed to examine the relations among social influence, exercise motivation, and exercise behavior. Models were estimated using EQS, version 5.7b (Multivariate Software Inc., Encino, CA). Comparative fit index (CFI) and standardized root mean square residual (SRMR) were employed as the primary criteria of model fit. Cutoff values of CFI > .95 and SRMR < .08 were interpreted to indicate good model fit (24). In addition, chi-square and degrees of freedom for the models are reported, with the ratio of chi-square to degrees of freedom employed as a secondary criterion of model fit.

RESULTS

Relationships Between Variables

The overall mean and standard deviations for the subscales of the questionnaires are presented in Table 1, and correlations between variables are presented in Table 2. A square root transformation was used to normalize the total exercise multiples of the resting metabolic rate variable. Social encouragement was significantly correlated with each of the six measures of exercise motivation and exercise behavior, whereas social constraint was weakly associated with only one measure of exercise motivation (have to commitment) and one measure of exercise behavior (investments). Variables associated with exercise motivation (enjoyment/satisfaction, want to commitment, and have to commit-

TABLE 1
Means and Standard Deviations of Subscales Measuring Social Encouragement, Social Constraint, Enjoyment/Satisfaction, Have to Commitment, Want to Commitment, Investments, and Total Exercise

Subscale	*Range*	*M*	*SD*	*Kurtosis*	*Skewness*
Social Encouragement (3 items)	1.00–0.00	7.79	2.09	0.64	–1.05
Social Constraint (4 items)	1.00–10.00	2.91	1.94	1.43	1.30
Enjoyment/Satisfaction (7 items)	1.00–10.00	7.78	2.33	0.58	–1.18
Want to Commitment (6 items)	1.00–10.00	7.28	2.73	–0.60	–0.80
Have to Commitment (3 items)	1.00–10.00	6.64	2.67	–0.66	–0.55
Investments (4 items)	1.00–10.00	6.11	2.88	–1.07	–0.45
Total exercise (METS)	0.00–222.00	50.08	44.50	1.60	1.33

Note. METS = metabolic equivalents.

TABLE 2
Correlations of Variables in the Model

Variable	*SE*	*SC*	*E/S*	*Want To*	*Have To*	*SEBC*	*Invest*	*Exercise*
Social encouragement	—							
Social constraint	.35**	—						
Enjoyment/satisfaction	.46**	.08	—					
Want to commitment	.45**	.12	.80**	—				
Have to commitment	.38**	.23**	.65**	.77**	—			
SEBC	.36**	.07	.64**	.83**	.64**	—		
Investments	.41**	.13*	.71**	.85**	.70**	.76**	—	
Total exercise	.21**	.03	.45**	.54**	.42**	.54**	.58**	—

Note. SE = social encouragement; SC = social constraint; E/S = enjoyment/satisfaction; Want To = want to commitment; Have To = have to commitment; Invest = investments; Exercise = total exercise; SEBC = Stages of Exercise Behavior Change.
*$p < .05$. **$p < .01$.

ment) were highly intercorrelated with investments and stage of exercise behavior change and moderately correlated with total exercise.

Structural Equation Modeling

Structural equation modeling was employed to analyze the relationships of social influence with motivational variables and reports of exercise behavior. As shown in Figure 1, exercise motivation was modeled as a latent variable, with want to commitment, have to commitment, and enjoyment/satisfaction as indicators of latent exercise motivation. This latent variable was modeled as a cause of each of the three measures of exercise behavior: stage of exercise behavior change, total exercise, and investments. Social encouragement was modeled as a cause of

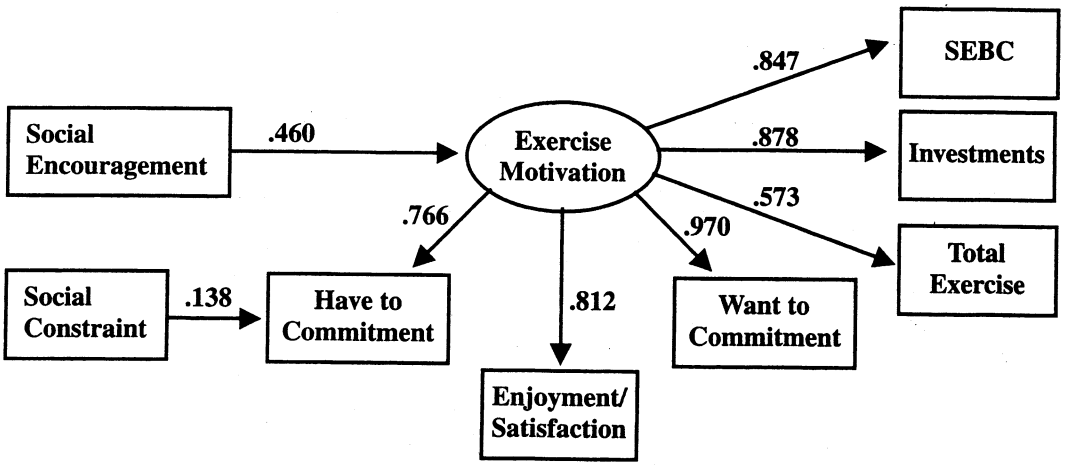

FIGURE 1 Structural model of relationships among social influence, exercise motivation, and exercise behavior. All loadings are significant standardized path coefficients. Error terms not shown.

latent exercise motivation. Social constraint was modeled as a cause of have to commitment.

The primary indicators for model fit—CFI and SRMR—indicate that the resulting model fit the data well: CFI = 0.984, which is greater than the cutoff value of .95, and SRMR = 0.033, which is less than the cutoff value of .08. In addition, the $\chi^2(17, N = 150) = 39.222$, $p = .004$, indicates a ratio of chi-square to degrees of freedom slightly over the conventional measure of 2:1, suggesting moderate fit. All paths shown in Figure 1 were significant.

Subsequent analyses were conducted to determine whether the relationships among social influence, exercise motivation, and exercise behavior were similar for individuals in different stages of adoption of exercise. The sample was split into two groups: individuals in the maintenance stage of exercise behavior change and individuals in premaintenance stages (action, preparation, and contemplation). This distinction was chosen because individuals who have achieved sustained behavior change may be different in important ways from those who have not and because this distinction permitted comparison between groups of similar size. A multigroup structural equation modeling analysis was then conducted to compare the relations among social influence, exercise motivation, and exercise behavior between those in the maintenance stage and those in the premaintenance stage of exercise behavior change. The model that was tested within each group was identical to the model previously presented, except that stage of behavior change was omitted.

Results indicate that the path from social encouragement to latent exercise motivation and the loading of enjoyment/satisfaction on latent exercise motivation differed across groups. The path coefficient from social encouragement to exercise motivation was significantly greater for individuals in the premaintenance stage than for individuals in the maintenance stage (0.530 and 0.217, respectively; $p < .001$). The loading of enjoyment/satisfaction on latent exercise motivation was also significantly greater for individuals in the premaintenance stages than for those in the maintenance stage (0.824 and 0.565, respectively; $p < .035$). These results indicate that social encouragement and enjoyment/satisfaction may be more important in the exercise motivation of individuals in the premaintenance stages of behavior change.

DISCUSSION

The study presented here revealed important information on the relationships among social influence, exercise motivation, and exercise behavior. Although previous studies have identified correlations between social influence and exercise behavior and between social influence and exercise motivation, this study tested a model linking all three (social influence, exercise motivation, and exercise behavior). This study also evaluated the different roles of social encouragement and social constraint on exercise behavior. The model that was presented fit the data well. Social encouragement was indirectly associated with three measures of exercise behavior, and this relationship was mediated by exercise motivation. In contrast, a measure of social constraint was associated with only have to commitment and was not associated, either directly or indirectly, with exercise behavior.

For an understanding of the implications of these findings, it is helpful to review the nature of the two social influence variables discussed here: social encouragement and social constraint. The Social Encouragement measure assessed perceptions of encouragement from significant others to exercise and included items such as "People important to me support my exercising" and "People important to me encourage me to exercise." In contrast, the Social Constraint measure assessed social expectations that make people feel obliged to exercise and included items such as "I feel pressure from other people to exercise" and "People will be disappointed in me if I quit exercising." The difference between these two variables can be viewed in terms of positive and negative social reinforcement (25). Social encouragement can be perceived as a form of positive reinforcement: As an individual first starts to consider exercise and then begins exercise, the individual receives a desired outcome—encouragement. On the contrary, social constraint can be viewed as a form of negative reinforcement: An individual exercises to avoid negative outcomes, such as others being "disappointed in me if I quit exercising."

Consistent with our predictions, this study found social encouragement or positive reinforcement to have direct influence on exercise motivation, which influences exercise behavior. Social constraint or negative reinforcement was found to influence only have to commitment. As they reflect Skinner's advocacy of positive reinforcement in behavior change over 50 years ago (25), these findings highlight the importance of focusing on promoting exercise through encouragement as opposed to negative personal or social consequences of failure to exercise. Similarly, a number of social psychology models of motivation are consistent with the observation that constraint does not lead to enduring motivation or task engagement. For example, reactance theory would predict that those who feel constrained to engage in a task would find the task less attractive than would those encouraged by positive incentives (26).

Our study has several limitations. The convenience sample was recruited from several groups suspected of having different levels of physical activity (e.g., running clubs and campus organizations). In addition, participants recruited from different sources tended to differ in age, level of physical activity, and gender. For example, participants from the running club tended to be active older men, whereas participants from university organizations tended to be younger women. Because of the demographic differences among groups and the fact that groups were not equally represented, no analyses were conducted to determine whether the model held up in each subgroup. Thus, the findings here may be confounded with other differences among the recruitment sources. Nevertheless, the convenience sample yielded by recruitment from these several groups did represent a range of exercise patterns, permitting test of factors associated with those patterns. Furthermore, the measure of social encouragement that was used evaluated only perceived general support and not type of support or support provider.

This study's findings were consistent with trends emphasizing positive approaches to health promotion as opposed to approaches emphasizing fear or constraint. In the Transtheoretical Model, Prochaska and colleagues (27,28) emphasized the importance of matching health interventions to an individual's stage of readiness for change. This model indicates that when encouraging movement toward "action" or toward engaging in a new behavior, emphasis should be placed on the pros of pursuing the behavior rather than on the negative consequences of failing to pursue it. This strategy has been shown to be effective in promoting long-term physical activity (29). In a similar manner, our study suggests that making people feel compelled to exercise and emphasizing the cons of not engaging in exercise may be ineffective in changing behavior. Finally, the distinction between Social Encouragement and Constraint runs parallel to that between Nondirective Support (cooperative, accepting feelings and choices) and Directive Support (taking control of tasks, prescribing "correct" feelings and choices) and findings that Nondirective Support is associated with disease management and quality of life (30).

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