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The Roles of Want to Commitment and Have to Commitment in Explaining Physical Activity Behavior

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Background: Several theories and models have been proposed to explain decisions in changing and adopting behavior but few address the intricacies of behavioral maintenance. The current study assesses the utility of the Investment Model, which identifies satisfaction, investments, and involvement alternatives as predictors of commitment and continued behavior, in predicting physical activity behavior. ***Methods:*** Participants (N = 267) completed questionnaires about physical activity and commitment. Structural equation modeling assessed relationships among 2 types of exercise commitment (*want to* or enthusiastic commitment, *have to* or obligatory commitment), 3 commitment determinants (satisfaction, investments, and alternatives), and physical activity (minutes of physical activity, stage of behavior change). ***Results:*** Want to commitment, but not have to commitment, was related to stage of exercise behavior change and time spent in physical activity. Satisfaction and investments were positively related to want to commitment; whereas, satisfaction, investments, and alternatives were positively related to have to commitment. The model explained 68% and 23% of the variance in time spent in physical activity and stage of behavior change, respectively. ***Conclusions:*** This study provides support for the application of the Investment Model to physical activity and suggests that want to commitment may be important for explaining and predicting sustained physical activity behavior.

Keywords: behavior change, adoption, maintenance, Investment Model, Sport Commitment Model

Regular physical activity is associated with lower mortality rates and the prevention and treatment of conditions such as coronary heart disease, hypertension, diabetes, obesity, osteoarthritis, osteoporosis, and depression.[1–4] Despite these benefits, approximately 49% of United States adults are sufficiently active, 24% are insufficiently active, and 14% are completely inactive.[5] In their review of exercise adherence research, Buckman and Dishman report that about half of individuals who start an exercise program return to a sedentary lifestyle.[6] Unfortunately, these numbers have not changed over the last 20 years.[6]

These statistics highlight a need to better understand factors associated with the adoption and *maintenance* of regular physical activity. Several health behavior models and theories have been proposed to explain decisions involved in changing or adopting health behavior. For example, the Theory of Planned Behavior posits that personal *attitudes* about the behavior, *subjective norms* (beliefs about how others perceive the behavior), and *perceived behavioral control* (beliefs about the extent to which a person has control over the behavior) influence an individual's intention to perform the behavior, and that this *behavioral intention* is the most important determinant of behavior.[7] Social Cognitive Theory posits that *self-efficacy* (confidence in one's ability to perform the specific behavior), *outcome expectations* (beliefs about anticipated outcomes of the behavior), *observational learning* (eg, learning through peer modeling), and *incentive motivation* (rewards and punishments for behavior) affect the likelihood that an individual will perform a target behavior.[8]

In addition to these theories, the Transtheoretical Model (TTM) posits that behavior change occurs through a series of stages: *precontemplation* (no intention of changing behavior in the next 6 months), *contemplation* (intention to take action in the next 6 months), *preparation* (intention to take action and having taken steps in that direction), *action* (in the process of making specific, overt behavior change), and *maintenance* (having changed behavior for at least 6 months). The TTM emphasizes 10 processes of change (eg, seeking information related to behavior change, enlisting social support, using stimulus control techniques), which are matched to these stages. The TTM also recognizes the roles of *decisional balance* (weighing pros and cons of changing behavior) and *self-efficacy* (confidence in one's ability to engage in or continue behavioral change in specific high-risk situations) on behavior.[9]

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Although these and other health behavior models and theories have been found to predict short-term behavior or the adoption of behavior, most fail to address the intricacy of behavioral maintenance.[10] For example, the Theory of Planned Behavior and Social Cognitive Theory assume that the same factors involved in initiating a behavior also influence continuation of that behavior. Even in stage-based models such as TTM the distinction between action and maintenance depends primarily on the time period for which the behavior was adopted.[10] Rothman points out that decisions involved in maintaining a behavior may differ from those involved in initiating a behavior and thus there is a need for more research on models of behavioral maintenance. Furthermore, Rothman identifies 2 key factors that may be important to behavioral maintenance: decisions about behavioral alternatives and satisfaction.[10]

The Investment Model, which identifies these factors as fundamental constructs influencing continued behavior, may be a model that could be used to further our understanding of behavioral maintenance. This model has been studied extensively and used to explain commitment and continued involvement in a variety of areas including relationships, jobs, and sports.[11,12] According to this model, satisfaction in a relationship or activity is influenced by rewards, costs, and an individual's expected outcomes from that relationship or activity. This satisfaction, in conjunction with investments and perceived alternatives, determines an individual's commitment.

The current study seeks to better understand aspects of the Investment Model as they relate to exercise commitment and maintenance of physical activity. The Investment Model provides a unique contribution to our understanding of exercise behavior in that instead of simply recognizing behavioral and cognitive processes involved with performing physical activity, this model takes into account the value one places on alternative and competing activities as well as one's satisfaction with physical activity.

The Sport Commitment Model is an expansion of the Investment Model that has been used to explain commitment to organized sports.[13,14] According to this model, increases in sport enjoyment, personal investments, social constraints, social support, and involvement opportunities are proposed to increase sport commitment; whereas, increases in involvement alternatives decrease sport commitment. Thus, this model contains the central components of the Investment Model but replaces the satisfaction construct with an enjoyment construct. The Sport Commitment model has received partial support. Enjoyment, investments, social constraints, and involvement opportunities have been found to predict sport commitment.[14–16]

The Sport Commitment Model has also been applied to exercise.[17] Two modifications were made in this process. First, satisfaction, a construct in the Investment Model, replaced enjoyment as a predictor of commitment. Second, commitment was viewed as being a multidimensional rather than unidimensional construct with 2 dimensions: *want to* commitment and *have to* commitment.[18] Want to commitment is enthusiastic, volitional, and influenced by satisfaction. In contrast, have to commitment is reluctant and obligatory commitment influenced by irretrievable investments, social pressures, and lack of alternatives. This multidimensional view of commitment is appealing because it recognizes that individuals may engage in exercise because they are enthusiastic about being active and/or because they feel compelled to be active due to factors such as health risks or social pressure.

In a sample of university students and staff (ages 18 to 69), Wilson and colleagues assessed whether these 6 commitment determinants predicted want to and have to commitment as well as whether these 2 types of commitment predict exercise behavior. Participants completed the Exercise Commitment Scale, a measure of exercise commitment, and a self-report measure of exercise behavior during a typical 7-day period. Confirmatory factor analysis was used to assess the multidimensional factor structure of the Exercise Commitment Scale. Due to difficulties with the factor structure of the involvement opportunities construct, this construct was not used in subsequent analyses. Structural equation modeling indicated that the model explained 12% of the variance in exercise behavior. However, only want to commitment was a significant predictor of exercise. In addition, the commitment determinants accounted for 51% of the variance in want to commitment and 31% of the variance in have to commitment. Satisfaction and personal investments were positively related to both want to and have to commitment, whereas involvement alternatives and social constraints were positively related to only have to commitment. Thus, all of the Investment Model constructs were significant predictors of commitment; however, involvement alternatives was positively rather than negatively related to have to commitment. With the exception of social constraints, the additional constructs added in the Sport Commitment Model were not independent predictors of commitment.

The current study seeks to confirm and extend research on the application of the Investment Model to exercise by assessing relationships among 2 types of exercise commitment (want to and have to commitment), the 3 commitment determinants (satisfaction, investments, and alternatives), and exercise behavior. This study assesses whether the Investment Model predicts time spent in leisure-time physical activity over a 7-day period as well as stage of exercise behavior change.

Method

All procedures were approved by the University of North Carolina at Greensboro Institutional Review Board of Human Subjects. Participants were informed of the confidential and voluntary nature of the study before their participation.

Participants

A total of 267 participants took part in this study. To obtain individuals with a variety of exercise experience, participants were recruited from university classes, campus organizations, private health clubs, and a community running club.

Procedures

Participants completed a basic demographic questionnaire to assess information such as age, gender, race, and education, as well as questionnaires about physical activity behavior and attitudes toward exercise. The questionnaires took approximately 15 to 25 minutes to complete. Participants returned questionnaires to the investigator upon completion.

Measures

Stages of Exercise Behavior Change (SEBC). The SEBC assessed current stage of exercise behavior.[19] From responses to 5 true or false items, individuals are categorized into one of 5 stages: precontemplation (do not exercise and do not intend to start exercising), contemplation (do not exercise but intend to start exercising), preparation (exercise some but not regularly), action (exercise regularly but for less than 6 months) or maintenance (exercise regularly for 6 months or longer). For this measure, regular exercise is defined as exercising 3 or more times a week for 20 minutes or longer. The SEBC has a kappa index of reliability of .78 over a 2-week period.[19]

Exercise Commitment Scale (ECS). The 32-item ECS assessed want to commitment (3 items; eg, "I am determined to keep exercising"), have to commitment (3 items; eg, "I feel obligated to continue exercising"), personal investments (3 items; eg, "I have invested a lot of time into exercising"), satisfaction (3 items; eg, "I find exercise to be very rewarding"), and involvement alternatives (3 items; eg, "Compared to exercise there are things I could do which would be more enjoyable").[17] Participants respond to each item using a 10-point scale (1 = not at all true for me; 10 = completely true for me). The factor structure of the ECS has been previously tested using confirmatory factor analysis.[17] Only items reported to load properly on latent factors in this previous study were used in the current analyses.

Physical Activity Recall Questionnaire (PAR). The 7-day PAR assessed minutes of physical activity in the previous week. Although this questionnaire was originally developed in an interview format,[20] it has also been used in a self-administered written format.[21] The PAR is a valid and reliable instrument.[22] Participants are provided with a list of activities and indicate the number of hours they spent in the activity over the previous 7-days. Since the ECS assessed commitment to *exercise*, only items assessing minutes of leisure time activity, which is more reflective of exercise, were used and items assessing lifestyle activity such as housecleaning, yard work, and physical labor were not used. This method was used to improve the congruency between the behavior being assessed and the type of commitment being assessed.

Statistical Analyses

Confirmatory factor analysis was first used to verify the multidimensional factor structure of the Investment Model constructs measured in the Exercise Commitment Scale. Separate analyses were conducted for subscales representing commitment types (want to commitment and have to commitment) and subscales representing commitment determinants (satisfaction, investments, and alternatives). Structural equation modeling then assessed relationships among commitment types, commitment determinants, time spent in physical activity over the previous 7 days, and stage of exercise behavior change. Models were estimated using EQS, version 6.1 (Multivariate Software Inc., Encino, CA). Comparative fit index (CFI), root mean square of approximation (RMSEA), and standardized root mean square residual (SRMR) were employed as the primary criteria of model fit. Cutoff values of CFI > .95, SRMR < .08, and RMSEA < .06 were interpreted to indicate good model fit.[23] 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. Finally, to determine whether there were mean differences in commitment and commitment determinants among individuals in different stages of change, a Multivariate Analysis of Variance (MANOVA) was conducted with commitment types (want to commitment and have to commitment) and commitment determinants (satisfaction, investments, and alternatives) entered as dependent variables and stage of exercise behavior change entered as a between-subjects variable.

Results

Participant Characteristics

Participants ranged in age from 18 to 79 years (mean = 26.34 years, SD = 13.31; 81.3% ≥ 30 years, 9.7% 31 to 50 years, 9% > 50 years). Sixty-three percent were female. The ethnic makeup of the sample was 72.3% Caucasian, 15.0% African American, 4.1% Hispanic, 3.4% Asian American, 1.1% Native American, and 3.7% of another race or ethnicity. Overall, participants tended to be fairly active, reporting an average of 264.24 minutes (SD = 300.73) of moderate physical activity a week and an average of 367.08 minutes (SD = 484.51) of vigorous physical activity a week. Based on their responses to the SEBC, participants were classified into one of 5 stages: precontemplation (n = 3, 1.1%), contemplation (n = 27, 10.1%), preparation (n = 57, 21.3%), action (n = 38, 14.2%), and maintenance (n = 140, 52.4%). When participants were asked how long they have been exercising

regularly, distribution by time was as follows: not at all (n = 71, 26.6%), less than 6 months (n = 52, 19.5%), 7 to 12 months (n = 27, 10.1%), 12 to 24 months (n = 19, 7.1%), 24 to 26 months (n = 14, 5.2%), and more than 36 months (n = 80, 30.0%). Of the participants who reported exercising regularly for more than 36 months, total years of exercise ranged from 4 years to 26 years (mean = 10.45 years). Due to the small number of participants in the precontemplation stage (n = 3), these participants were excluded from subsequent analyses.

Confirmatory Factor Analysis

Confirmatory factor analysis was used to verify the measurement model of the want to commitment, have to commitment, satisfaction, investments, and involvement alternatives Exercise Commitment Scale subscales. The first analysis, assessing commitment types, specified a model with latent variables for want to commitment and have to commitment. The second analysis, assessing commitment determinants, specified a 3-factor model with latent variables for satisfaction, investments, and alternatives. In both analyses, the measurement models contained no double-loading indicators, all measurement error was presumed to be uncorrelated, and all latent variables were allowed to correlate with one another. The alternatives latent variable contained 4 indicators. All other latent variables contained 3 indicators. For each latent variable, 1 indicator was constrained to 1.

Each analysis used listwise deletion. For the commitment types' analysis, 2 participants had missing data and 2 participants were excluded because they were multivariate outliers. This left 258 participants for analysis. For commitment determinants, 6 participants were excluded for missing data and 2 were excluded because they were multivariate outliers. This left 254 participants for analysis. There were no univariate concerns with the data. In both analyses, multivariate statistics indicated that the data differentiated substantially from normality (Mardia's estimate = 14.38 and 18.66 for commitment types and commitment determinants, respectively). Therefore, maximum likelihood estimation procedures with robust statistics were used. In the text which follows, asterisks are used to signify robust statistics.

The sample variance-covariance matrix was analyzed. Goodness of fit was evaluated using the Satorra-Bentler scaled chi-square, comparative fit index, and root mean square error of approximation. Overall, the models for both commitment types (CFI* = 0.991; RMSEA* = 0.080, SRMR = 0.031) and commitment determinants (CFI* = 0.987; RMSEA* = 0.058; SRMR = 0.034) fit the data well. In addition, the ratios of the Satorra-Bentler scale chi-square to degrees of freedom for both commitment types, χ^2 (8, N = 258) = 21.20, $P < .01$, and commitment determinants, χ^2 (32, N = 254) = 65.38, $P < .01$, were slightly above the conventional measure of 2:1 suggesting moderate fit.

Unstandardized and completely standardized parameter estimates from this solution are presented in Figures 1 and 2. All freely estimated unstandardized parameters were statistically significant. Factor loading estimates revealed that the indicators were strongly related to their respective latent factors (R^2s = 0.42 to 0.97 for commitment types; R^2s = 0.56 to. 0.96 for commitment determinants).

These results verify that the Exercise Commitment Scale subscales are reliable indicators of the constructs of want to commitment, have to commitment, satisfaction, investments, and alternatives. In the analysis for commitment determinants, estimates from the 2-factor solution indicated a high relationship between want to and have to commitment ($r = .85$). A 1-factor model was also evaluated but fit criteria indicated that this model was not as good a fit as the 2-factor model (CFI* = 0.940; RMSEA* = 0.198, SRMR = 0.077, Satorra-Bentler χ^2 (9, N = 258) = 99.96, $P < .001$).

Structural Equation Modeling

Table 1 displays relationships among commitment types, commitment determinants, minutes of physical activity, and stage of behavior change. Because minutes of total leisure time physical activity was skewed (mean = 641.95, Median = 480.00, skewness = 1.98, SE of skewness = 0.15), a square root transformation was used for this variable. All variables were significantly related. Structural equation modeling was used to assess the utility of the Investment Model for predicting minutes of physical activity and stage of exercise behavior change. As shown in Figure 3, items for the Exercise Commitment Scale subscales were loaded onto a latent factor for that subscale with no cross-loadings. Latent factors for the 3 commitment determinants (satisfaction, investments, and alternatives) were allowed to correlate. Satisfaction, investments, and alternatives were modeled as causes of each type of commitment. In turn, each type of commitment was modeled as a cause for stage of behavior change and for the square root transformed minutes of leisure-time physical activity. Eleven cases were excluded (10 containing missing data; 1 multivariate outlier) leaving 251 cases for analysis.

The Mardia's estimate (22.73) indicated that data differed substantially from normality. Consequently, robust statistics were evaluated to determine model fit. The primary indicators for model fit, indicated that the resulting model fit the data well (*CFI = 0.975; *RMSEA = 0.059; SRMR = 0.043). In addition, the Satorra-Bentler Scaled χ^2 (124, N = 251) = 232.71, $P < .001$, was slightly below the conventional measure of 2:1.

Results indicated that want to commitment was positively related to minutes of leisure time physical activity and stage of exercise behavior change; whereas, have to commitment was not related to these variables. Commitment explained 23% of the variance in minutes of physical activity and 68% of the variance in stage of exercise behavior change. Satisfaction, investments, and alternatives predicted have to commitment; whereas, satisfaction and investments predicted want to commitment.

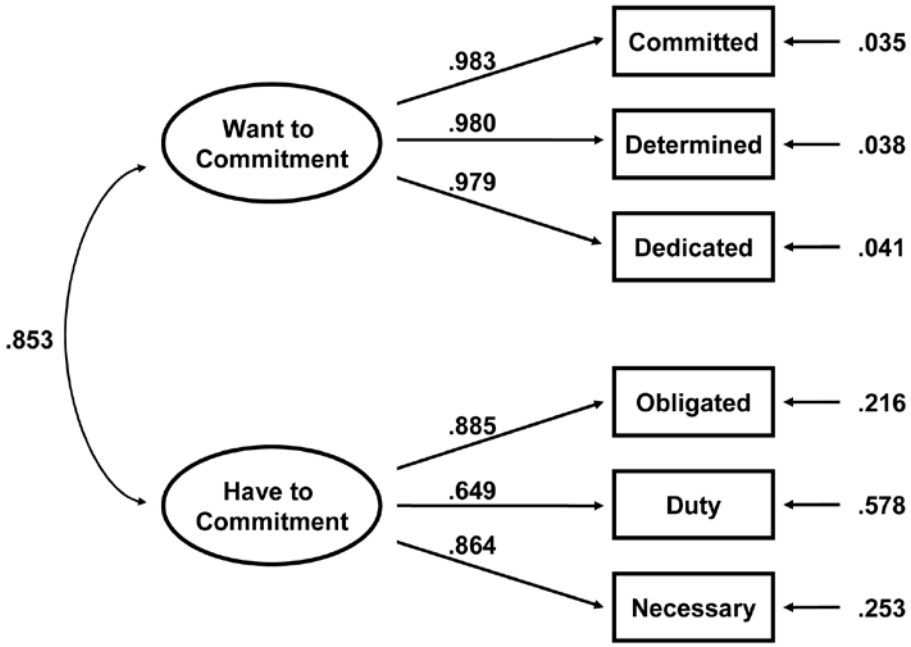

Figure 1 — Confirmatory factor analysis of commitment types. All paths are significant at $P < .05$. * indicates robust statistics. CFI* = 0.991; RMSEA* = 0.080, SRMR = 0.031.

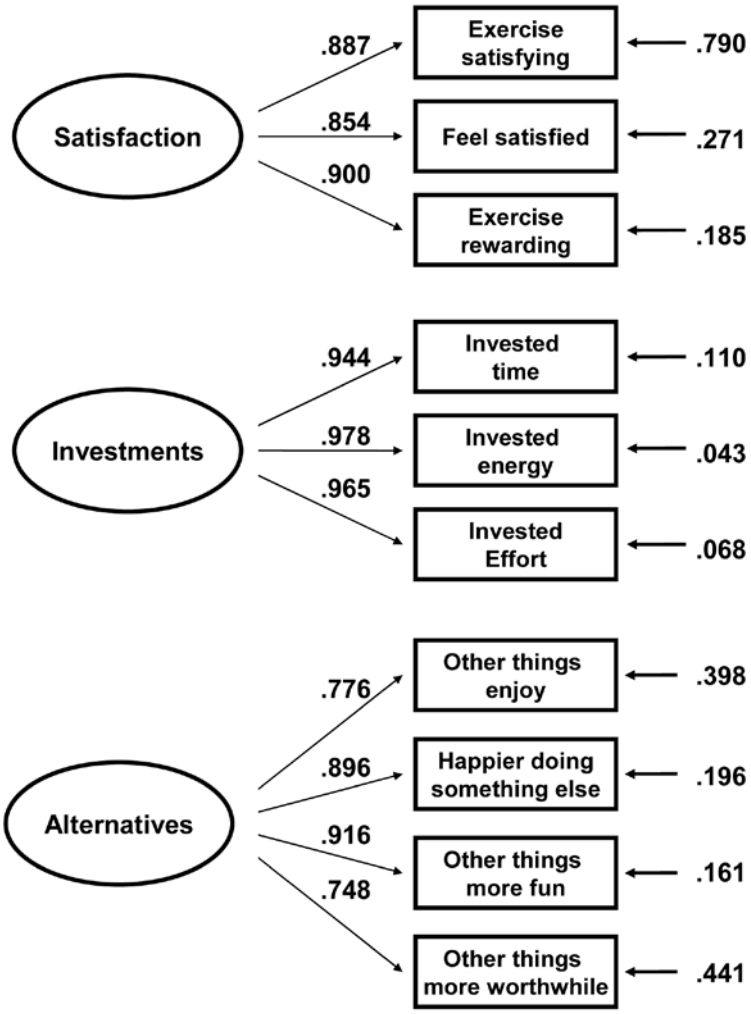

Figure 2 — Confirmatory factor analysis of commitment determinants. All paths are significant at $P < .05$. * indicates robust statistics. CFI* = 0.987; RMSEA* = 0.058, SRMR = 0.034.

Table 1 Correlations Between Commitment Types and Commitment Determinants of the Investment Model Along With Means and Standard Deviations

Subscale	Mean	SD	1	2	3	4	5	6	7
1. Want to commitment	7.57	2.78	—						
2. Have to commitment	6.67	2.66	.755**	—					
3. Satisfaction	7.86	2.39	.741**	.644**	—				
4. Personal investments	6.80	3.08	.839**	.710**	.679**	—			
5. Involvement alternatives	5.61	2.35	–.502**	–.346**	–.507**	–.477**	—		
6. Square root of minutes of physical activity	22.53	11.61	.457**	.363**	.384**	.522**	–.244**	—	
7. Stage of behavior change	4.11	1.08	.813**	.639**	.606**	.782**	–.487**	.505**	—

** = $P < 01$.

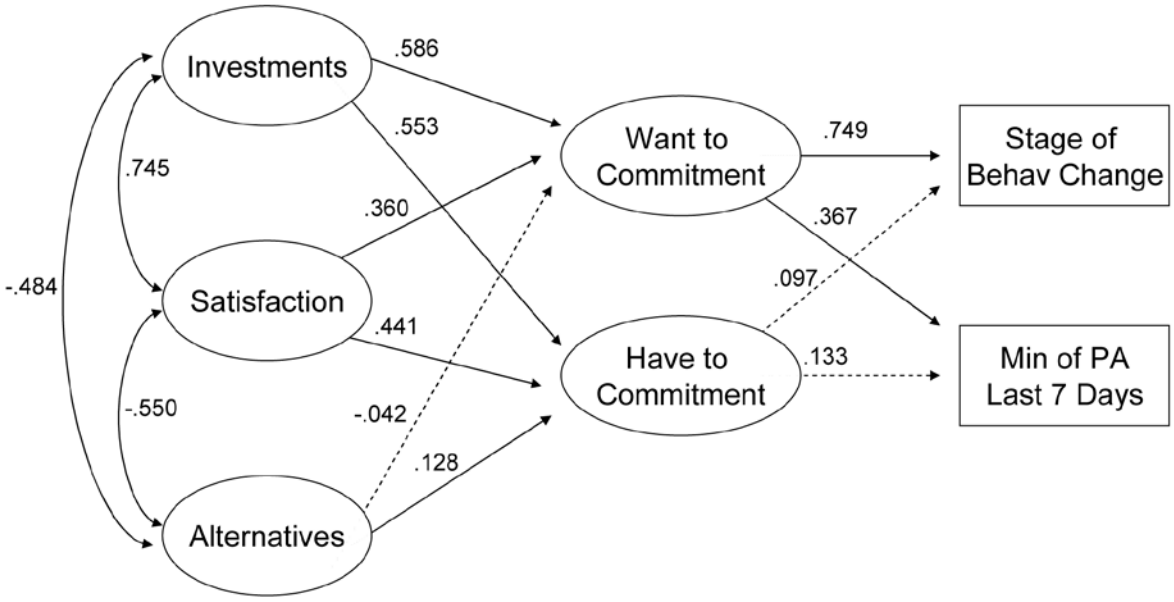

Figure 3 — Structural equation modeling showing relationships among commitment determinants, commitment types, and physical activity. Pathway coefficients represent standardized estimates using maximum likelihood estimation procedures. Solid lines indicate paths are significant at $P < .05$. Dashed lines indicate paths are not significant. Error terms not shown. * indicates robust statistics. CFI* = 0.975; RMSEA* = 0.059, SRMR = 0.043.

Together these commitment determinants explained 82% of the variance in want to commitment and 74% of the variance in have to commitment.

In addition to this analysis, 2 additional analyses were conducted to further test the appropriateness of this model. To take into account any significant over reporting of physical activity, the first analysis excluded participants who reported more than 20 hours of physical activity. The model continued to fit the data well [*CFI = 0.980; *RMSEA = 0.055; SRMR = 0.046; Satorra-Bentler Scaled χ^2 (124, N = 215) = 204.48, $P < .001$]. In this model, the magnitude of the path from alternatives to have to commitment decreased and became nonsignificant (standardized path coefficient = .107). All other paths significant in the model using all participants were significant in this model and the magnitudes of standardized path coefficients were similar across models. To take into account the skewed age distribution, a separate analysis excluded individuals who were older than 30. Once again the model fit the data well [*CFI = 0.978; *RMSEA = 0.059; SRMR = 0.041; Satorra-Bentler Scaled χ^2 (124, N = 201) = 211.22, $P < .001$]. The significance and magnitude of standardized path coefficients in this model were similar to the model using all participants.

Want to Commitment, Have to Commitment, and Commitment Determinants Across the Stages of Change

A MANOVA was conducted to determine whether there were significant differences between individuals in different stages of change for commitment types and commitment determinants. The Wilks's lambda multivariate test of overall differences among stages of exercise behavior change was statistically significant, $\Lambda = .27$, $F(15, 682) = 27.96$, $P < .01$, $\eta^2 = .42$. Univariate between-subjects tests indicated that stage of exercise behavior change was related to want to commitment, $F(3, 251) = 176.71$, $P < .01$, $\eta^2 = .68$; have to commitment, $F(3, 251) = 59.99$, $P < .01$, $\eta^2 = .42$; satisfaction, $F(3, 251) = 56.33$, $P < .01$; personal investments, $F(3, 251) = 139.13$, $P < .01$, $\eta^2 = .62$; and involvement alternatives, $F(3, 251) = 26.40$, $P < .01$, $\eta^2 = .24$.

Bonferroni tests for post hoc comparisons indicated a trend for higher want to commitment, have to commitment, satisfaction, and investments across stages from contemplation to maintenance while the opposite trend was found for involvement alternatives (see Table 2). Significant differences were found between all stages for want to commitment and investments. For have to commitment and satisfaction, significant differences were found between all stages except action and maintenance. For alternatives, significant differences were found between all stages except contemplation and preparation and preparation and action.

Discussion

This study confirms and extends research on the application of the Investment Model to exercise. Want to commitment was positively related to time spent in physical activity over the previous week and stage of exercise behavior change. This finding suggests that want to commitment may be an important factor in explaining and predicting physical activity behavior and physical activity maintenance. In addition, that commitment relates to time spent in physical activity over the previous week as well as sustained behavior change adds to previous literature indicating that commitment and commitment language are related to continued involvement in treatment, behavior change, relationships, and jobs.[11,12,24]

The differentiated roles of want to, or enthusiastic, commitment and have to, or obligatory, commitment on physical activity behavior support the view that commitment may be a multidimensional construct. That only want to commitment is related to time spent in physical activity and stage of exercise behavior change corroborates results from a previous study indicating that want to commitment, but not have to commitment relates to volume of exercise,[17] as well as results from a study indicating that gymnasts with high levels of *attracted* commitment (similar to want to commitment) are more likely to continue their involvement in gymnastics 1 year later than those who endorse high levels of *entrapped* commitment (comparable to have to commitment).[25] Furthermore, these results support previous findings of studies assessing aspects of Social Determination Theory

Table 2 Means and Standard Deviations of Commitment Types and Commitment Determinants for Each Stage of Exercise Behavior Change

		C	P	A	M	*F*	Tukey's post hoc test (*P* < .05)
Want to commitment	Mean	2.85	5.15	8.25	9.30	176.71**	C < P, C < A, C < M
	SD	1.79	2.16	1.73	1.19	(3, 251)	P < A, P < M, A < M
Have to commitment	Mean	3.17	4.82	7.22	7.96	59.99**	C < P, C < A, C < M
	SD	1.95	2.26	2.25	1.92	(3, 251)	P < A, P < M
Personal investments	Mean	1.98	3.72	6.55	7.89	139.13**	C < P, C < A, C < M
	SD	1.17	2.26	2.19	1.66	(3, 251)	P < A, P < M, A < M
Satisfaction	Mean	4.22	6.74	8.40	8.91	56.33**	C < P, C < A, C < M
	SD	2.58	2.27	2.06	1.39	(3, 251)	P < A, P < M
Involvement alternatives	Mean	7.89	6.71	5.89	4.63	113.34**	C < A, C < M, A > M
	SD	1.46	2.42	2.23	1.61	(3, 251)	

** = $P < .01$.

Abbreviations: C, Contemplation; P, Preparation; A, Action; and M, Maintenance.

which found autonomous motivation (ie, motivation that is intrinsic or volitional) to be more influential to long-term behavior than controlled motivation (ie, motivation driven by external factors such as reward and punishment and characterized by pressure to feel, think, or behave in a certain way).[26,27] Taken together, the findings from this study and previous studies support Deci and Ryan's suggestion that the type and quality of motivation to perform a behavior may be influential to sustained behavior.[26]

The magnitude of the relationship between want to commitment and minutes of leisure activity (.367) was smaller than the magnitude of the relationship between want to commitment and stage of exercise behavior change (.749). The modest relationship between want to commitment and minutes of leisure time physical activity may be explained by the fact that commitment assesses the likelihood of continuing to exercise without any mention of time spent in exercise. Two individuals may be equally committed to exercising; however, one may be committed to walking for 20 minutes a week whereas the other may be committed to walking 200 minutes a week. Thus, commitment may be related to performing physical activity behavior repeatedly, but factors other than commitment may influence the frequency and duration of sessions, which in turn influence the total time spent in physical activity.

In addition to assessing relationships among commitment and physical activity behavior, this study also investigated whether satisfaction, investments, and alternatives predicted commitment as proposed in the Investment Model. Satisfaction and investments were significantly related to want to commitment; whereas, satisfaction, investments, and alternatives were significantly related to have to commitment. These commitment determinants explained 82% of the variance in want to commitment and 74% of the variance in have to commitment. One difference was noted between the findings of this study and the relationships proposed in the Investment Model: involvement alternatives was positively rather than negatively related to have to commitment.

These relationships between commitment determinants and commitment types found in this study are similar to findings in previous studies. Wilson et al[17] found satisfaction and investments to be positively related to want to commitment and satisfaction, investments, and alternatives to be positively related to have to commitment. The relationships between want to commitment, have to commitment, and commitment determinants also corroborate previous studies of relationship and job commitment, which found higher satisfaction, higher investments, and lower alternatives to be associated with commitment.[12,28] Additionally, these findings support Johnson's assumptions that have to commitment is influenced by irretrievable investments and Rothman's suggestion that satisfaction and decisions about behavioral alternatives are important factors which influence whether an individual decides to continue to exercise.[10,18]

Turning to types of commitment, want to commitment and have to commitment are suggested to be orthogonal constructs. In the current study, less than 30% of participants reported greater scores of have to commitment than want to commitment and even in these individuals the discrepancy was small. This finding may be attributed to the fact that this study contained a relatively healthy, active population. Future studies should investigate populations expected to have greater variance in levels of want to and have to commitment to determine whether these 2 types of commitment interact or have different effects on exercise behavior. For example, it may be that have to commitment only predicts long-term exercise behavior when there are also high levels of want to commitment. Populations that could be studied who may feel more obliged to exercise include overweight or obese individuals, type II patients with diabetes, cardiac rehabilitation patients, or compulsive exercisers.

In addition to predicting behavior, the distinction between want to commitment and have to commitment may be useful in improving our understanding of the mechanisms by which interventions influence behavior. For example, motivational interviewing has been found to be an effective method to assist individuals in changing behavior who may be resistant to change or ambivalent to change.[29] Future studies could determine whether motivational interviewing results in changes in want to and/or have to commitment as well as commitment determinants such as satisfaction, investments, and alternatives. In addition, studies could examine whether individuals with certain commitment profiles (ie, high have to commitment and low want to commitment) respond better to this type of intervention than traditional interventions.

The current study has limitations that should be addressed in future studies. First, this study consisted of a convenience sample of individuals expected to have different degrees of exercise participation. As a whole, participants in this study were fairly active and may have had higher levels of exercise commitment than the general population. Second, the study assessed self-reported physical activity. Future studies should consider using accelerometers, pedometers, or daily logs rather than a recall method to provide a more accurate measurement of physical activity. Third, the time frame assessed was the previous week. Because commitment is associated with behavior that persists over time, future studies should assess physical activity for a time period longer than a week. Fourth, the study used a cross-sectional design making the direction of causality difficult to establish. Longitudinal studies are needed to further investigate whether baseline commitment scores predict continued exercise participation, whether changes in commitment determinants can predict changes in commitment,

and whether want to and have to commitment act as a mediator between commitment determinants and physical activity.

In conclusion, findings from the current study indicate that want to commitment is related to time spent in leisure time physical activity and stage of behavior change; whereas, have to commitment has no relationship with these variables. In addition, satisfaction and investments are positively related to want to commitment; whereas, satisfaction, investments, and alternatives are positively related to have to commitment. These results highlight the potential utility of Investment Model in predicting the adoption and maintenance of physical activity behavior.

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