Behavioral Regulation and Dispositional Flow in Exercise among American College Students relative to Stages of Change and Gender

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Abstract. Objective: The purpose of this study was to examine behavioral regulations and dispositional flow in exercise among university students in terms of gender and stage of change. **Participants:** Data were collected from American college students ($n = 257$; $M_{age} = 23.02 \pm 4.05$) in Spring 2013. **Methods:** Behavioral regulations and dispositional flow in exercise were assessed, along with stage of change. **Results:** Exercisers in the maintenance stage of change displayed significantly more self-determined motivation to exercise and a greater tendency to experience flow than those in preparation and action stages. Significant correlations were observed among behavioral regulations and flow state. Nonsignificant differences were observed for gender on behavioral regulations and dispositional flow in exercise. **Conclusions:** The results suggest that promotion of self-determined motivation and dispositional flow in exercisers may improve the quality of their experiences, as well as to foster their exercise behavior.

Keywords: Exercise motivation, dispositional flow, self-determination theory, college students

Engagement in exercise is widely known to have physical and psychological health benefits, yet the majority of people still remain largely inactive.[1] Young adults have not been an exception in exhibiting this undesirable pattern of physical activity.[2] Studies on US college students' physical activity have typically revealed levels below those required to produce health and fitness benefits.[3,4] Understanding the motivational and emotional factors that influence participation in physical activity in this population can be beneficial for health promotion efforts.[5]

Exercise-related behavioral regulations influence the regular physical activity behaviors of individuals.[6] A conceptual framework frequently used in this area is self-determination theory (SDT).[7] SDT is comprised of several subtheories including cognitive evaluation theory, organismic integration theory, causality orientations theory, goal content theory, and basic needs theory. Organismic integration theory has been widely used in studies of exercise and physical activity because of the multidimensional conceptualization of motivation and because it explains how autonomy supportive environments can facilitate autonomous engagement in an activity through the process of internalization and integration of behavioral enactments into one's sense of self.[8]. Six types of motivational regulations (i.e., intrinsic, integrated, identified, introjected, external, amotivation) varying in degree of self-determination underlying the behavioral engagement are characterized in the theory. *Amotivated* exercisers lack all intention to exercise or exercise without intent (i.e., they may "go through the motions") while individuals who are intrinsically motivated to exercise freely engage in physical activity for enjoyment and satisfaction. Extrinsic motivational regulations span the continuum between amotivation and intrinsic motivation. These include external, introjected, identified and integrated regulations. Exercisers who engage a physical activity

for external rewards or to avoid punishment are *externally regulated*. *Introjected regulation* underlies behavior for those feeling compelled to take in physical activity to avoid aversive feeling states (e.g., guilt over skipping a workout) or to experience ego-affirming states (e.g., pride in fitness). The behavior of exercisers who participate in activity for benefits of exercise, and assign personal importance to engagement of regular physical activity, is said to be governed by *identified regulations*. Finally, *integrated regulations* relate to engaging in the activity because it is integrated with the individual's sense of self, goals and values. *Intrinsic, integrated and identified regulations* are considered to be more self-determined, while *introjected and external regulation* are considered non-self-determined forms of motivation.[9]

Overall, self-determined motivation has been consistently associated with exercise adoption and maintenance;[10] whereas external regulation and amotivation have consistently been found to be unrelated to, or negatively associated with exercise adoption and maintenance.[11] The association between introjected regulation and exercise has been found to be equivocal; with both positive and inverse relationships being reported across different studies.[12,13]

In his theory of flow (FT), Csikszentmihalyi[14] suggests that behavior is performed and maintained because there are clear goals, feedback on performance is easily self-assessed, and one's skill level is sufficient to meet the challenge of the physical activity. It may be easy to experience flow in exercise setting, because it usually includes a balance between challenge and competence, clear goals, and immediate feedback on performance. FT has been used to explain individuals' pleasurable engagement in sports and leisure activities. Flow is an experiential state that causes individuals to engage in the activities as an end in itself rather than for some contingency external to the activity.[10] Researchers have shown that individuals are more likely to experience flow in engagements that are autonomously undertaken than in

engagements that are less self-determined in nature.[15,16] It seems apparent, therefore, that more self-determined involvement in exercise resulting in flow may be an important factor in exercise adherence.

In understanding motivational and flow related determinants of exercise behavior, it is important to note that the process of initiation and eventual adherence to exercise have been conceptualized as being multi-dimensional and dynamic in nature.[17] That is, it is assumed that individuals move through a series of stages of change in their adoption of exercise behaviors in moving from living a sedentary lifestyle to regularly maintaining a physically active lifestyle.[18] Dishman[19] highlighted the utility and potential contributions of stage conceptualizations of exercise behaviors, and several researchers[20,21] have identified the transtheoretical model (TTM) as a particularly useful stage conceptualization on that account. More self-determined regulation of exercise behavior (e.g., identified regulation) has been associated with exercise in higher TTM stages[22,23] but few studies have examined both motivational regulation and dispositional flow in different stages of exercise behavior change.[15,16]

Gender differences were also examined in this research because female students tend to engage in lower levels of physical activity than male students.[24] Men's and women's exercise have typically been described as resulting from similar behavioral regulation patterns[25,26] although puzzling differences have occasionally been reported. For example, when compared with men, women have been variously reported to exercise for more controlled reasons[10] or, alternatively, more autonomously regulated reasons.[27] With regard to dispositional flow, gender differences in exercise settings have not been previously examined, and only considered to a limited degree in sport settings where women scored lower than men in one study[28] while no meaningful differences were reported in another.[29] Rising rates of unhealthy behavior and declining fitness levels have increased interest in

understanding motivations that underly these trends. Accordingly, examination of behavioral regulations and dispositional flow across stages of change in exercise behavior is important for improving understanding for health programming.

Knowledge is also advanced by this study because the flow experience in exercise has not yet to be well-studied in exercise psychology. Therefore, the aim of the present study was to examine differences in dispositional flow and exercise regulations varying in self-determination with regard to stage of change for exercise and gender in college students. Based on the theoretical propositions of SDT[10,11], FT[15], TTM[22], and extant research, we hypothesised that: (1) self-determined exercise motivation (i.e. intrinsic and identified regulation) would be higher in later stages of change; (2) external and introjected regulation and in particular amotivation would be higher in earlier stages of change; (3) dispositional flow would be higher in later stages of change; (4) high intrinsic and identified regulation would be positively associated with dispositional flow; (5) low external and introjected regulation and amotivation would be negatively associated with dispositional flow; and finally, (6) male students would report higher intrinsic and identified regulation and tendency to experience flow than female students.

METHODS

Population and Sampling

Data were collected from 251 college students (104 males, 147 females) from a large university in the Southeastern United States. These volunteer exercisers were aged between 19-35 years ($n_{male=}104$; $M_{age}=23.57\pm4.18$ and $n_{female}= 147$; $M_{age}=22.76\pm3.96$) and 67.7% (170) self-identified as being white. These exercisers reported engaging in a wide variety of physical activities with 16 activity types being identified by more than a single respondent. The three most commonly reported included running (n = 76), weight-lifting (*n* = 66), cardiovascular exercise (*n* = 77). The participants reported exercising more than 2 times

weekly in exercise sessions generally ranging from 46 to 90 minutes. Students completed the questionnaires with regard to their involvement in their chosen exercise activities of their choice.

Instrument

Behavioral Regulations in Exercise. The Behavioral Regulations in Exercise Questionnaire-2 (BREQ-2)[30] is a 19-item instrument containing five subscales measuring varying degrees of self-determination in exercise regulations (i.e., external, introjected, identified, intrinsic regulations, amotivation).[31] Following the statement "Why do you exercise?", participants are asked to respond to each item on a 5-point scale anchored by 0 *not at all true for me* and 4 *very true for me*. Data obtained with the BREQ-2 from exercise partipants in various settings and age groups in previous investigations have been found to valid and reliable.[23,31]

Dispositional Flow in Exercise Scale. Dispositional Flow *in Exercise* Scale **(**DFS-2)[32] is comprised of 36 items and is used for assessing individual's tendency to experience flow in sport and exercise. In this investigation, participants were asked to think about how often they typically experience the characteristic described in each item during their exercise workouts and to respond on a 5-point Likert scale ranging from 1 *Never,* to 5 *Always*. There are nine subscales including challenge-skill balance, merging of action and awareness, clear goals, unambiguous feedback, total concentration, sense of control, loss of self-consciousness, transformation of time and autotelic experience. The total of all item responses represents the global score for flow disposition with higher scores indicating a greater tendency to experience flow during exercise workouts. Confirmatory factor analyses of data obtained with the DFS-2 has demonstrated acceptable fit (i.e., NNFI > .90, CFI > .94, RMSEA < .05) for the global factor model of dispositional flow based on nine first-order factors.[32]

Stages of Change in Exercise. Scores obtained with the Physical Activity Stages of Change Questionnaire **(**PASCQ)[33] have demonstrated validity for categorizing individuals' on their level of readiness to participate in physical activity. It requires participants to answer four questions on their physical activity participation with either a "yes" or a "no." Those responses were used in a scoring algorithm to classify participants into one of five different stages (pre-contemplation, contemplation, preparation, action, and maintenance). Individuals classified as being in the precontemplation stage were inactive without any intention to become active in the subsequent 6 months. Individuals categorized as being in the contemplation stage were inactive but had an intention to start exercising within the upcoming 6 months. Individuals classified as being in the preparation stage exercised occasionally but not regularly while individuals in the action stage had been exercising regularly albeit for less than 6 months. Individuals classified in the maintenance stage had been exercising regularly for 6 months or longer.

Procedure

The first author recruited the participants involved in exercise by visiting the university fitness center and through the College of Education Subject Pool. Specifically, potential participants were to login to the online Subject Pool System, and sign up for the study. Students who participated online received course credit for their participation. To be eligible for the study, participants had to be active (that is to say in preparation, action or maintenance stages of exercise involvement). Note that by active we mean exercising regularly. Prior to the study, approval to conduct research with human participants was obtained from the university's Institutional Review Board. All participants provided signed an informed consent before taking part in the study.

Data Analysis

Data were analyzed using both descriptive and inferential procedures including

Multivariate analysis of variance (MANOVA), Independent samples t-tests and Pearson Product Moment Correlations. Box's M tests and Levene's tests were used to check that the assumptions of equality of variances and covariances of the dependent variables had been met. MANOVA follow-up tests, where appropriate, were conducted using ANOVA and Tukey's post hoc tests. The descriptive approach involved frequencies and percentages. Statistical significance was accepted at the $p < .05$ level of probability for all analyses. The effect sizes were estimated with partial eta square and Cohen's *d* values.[35]

RESULTS

Means and standard deviation of exercise motivation and dispositional flow in exercisers by stage of exercise behaviour change are shown in Table 1. Frequency analysis showed that 14 participants were at the preparation stage of exercise behavior change, 38 were at the action stage and 199 at the maintenance stage. The internal consistency coefficient for BREQ-2 subscales for this sample ranged between 0.48 and 0.83 (Table 1). The amotivation ($\alpha = .48$) and identified regulation ($\alpha = .66$) subscales exhibited relatively low reliability value although the identified regulation alpha is arguably tolerable for exploratory research.[34] Further examination of the data revealed low variability in item responses for the amotivation subscale (i.e., most participants reported "0" or "1" on the four amotivation items as is evident in the very low subscale total sample mean and standard deviation, $M = 4.62 \pm 1.32$). Alpha values are attenuated when variation in response is low and a low alpha in those instances is not inherently indicative of an internal consistency problem.[36] Furthermore, Cronbach's alpha coefficients for DFS-2 subscales for this sample ranged between .76 and .89 (Table 1).

----------INSERT TABLE 1 ABOUT HERE----------

A significant multivariate effect for stage of change in exercise was observed in a

MANOVA with BREQ-2 subscales as the dependent variables, Wilk's $\lambda = 0.80$, $F_{(10, 488)} = 5.69$, $p < 0.001$, $\eta_p^2 = 0.104$). As detailed in Table 1, follow up univariate analyses of variance indicated significant stage of change effects with moderate to large η_p^2 effect sizes[35] (i.e., 0.064 to 0.164) on all variables except external regulation ($\eta_p^2 = 0.012$) where a small nonsignificant effect size was observed. Tukey's post hoc tests indicated that participants in the preparation stage reported lower *intrinsic, identified* and *introjected regulation* scores than participants in the action and maintenance stages. Participants in the preparation stage reported higher *amotivation* scores than those in the action and maintenance stages. These findings provided support for the first hypothesis and partial support for the second hypothesis.

A significant multivariate effect for stage of change in exercise was also observed in a MANOVA with the DFS-2 subscales as the dependent variables, Wilk's $\lambda = 0.86$, $F_{(18, 480)} = 2.17$, $p < 0.05$, $\eta_p^2 = 0.075$. Also as detailed in Table 1, follow up univariate analyses of variance revealed significant omnibus effects with small to medium effect sizes[35] for three of the subscales including *clear goals* ($\eta_p^2 = 0.030$), *total concentration on the task at hand* ($\eta_p^2 = 0.043$), and *autotelic experience* ($\eta_p^2 = 0.080$). Trivial-to-small nonsignificant stage of change effect sizes[35] (i.e., $\eta_p^2 < 0.02$ as reported in Table 1) were observed relative to all other DFS-2 subscales. Tukey's post hoc tests indicated that participants in the preparation stage reported lower *clear goals* scores than participants in the maintenance stage. Participants in the preparation stage reported lower *total concentration on the task at hand* scores than those in the maintenance stage. And also participants in the preparation stage reported lower *autotelic experience* scores than those in the action and maintenance stage. These findings partially supported for the third hypothesis.

----------INSERT TABLE 2 ABOUT HERE----------

Pearson correlations between each of the BREQ and DFS-2 subscales and findings are

presented in Table 2. The significant correlation coefficients between the behavioral regulations and dispositional flow subscales variables ranged from small (r = .12) to large (r = .66) in absolute magnitude.[35] Intrinsic regulation was significantly and positively associated with all subscales of dispositional flow. Identified regulation was significantly and positively associated with all DFS-2 subscales except for loss of self-consciousness to which it was unrelated. Contrary to our hypotheses, introjected regulation had significant, albeit modest, positive relationships with clear goals, unambiguous feedback, autotelic experience. Significant but weak negative associations were observed between external regulation and dispositional flow subscales (i.e., clear goals, unambiguous feedback, sense of control, loss of self-consciousness, autotelic experience). A similar pattern of negative associations was observed between amotivation and challenge-skill balance, clear goals and autotelic experience (Table 2). These findings supported the fourth hypothesis and partially supported the fifth hypothesis.

----------INSERT TABLE 3 ABOUT HERE----------

Small Cohen's *d* effect sizes[36] and nonsignificant independent samples t-test results were observed in gender comparisons of all BREQ-2 and DFS-2 subscales (see Table 3). These findings did not provide support for the sixth hypothesis (all $p > .05$).

COMMENT

The purpose of the present study was to examine the exercise behavioral regulations and dispositional flow among college students with regard to stage of change in exercise and gender. Another aim of the investigation was to investigate relationships among behavioral regulations and dispositional flow in exercise. Self-determined motivation and the dispositional flow dimensions of clear goals, total concentration and autotelic experience were observed to be higher in later stages of change of exercise in this study. We also

observed dispositional flow variables to be significantly and positively associated with self-determined motivation. Finally, nonsignificant differences were found in the behavioral regulations and dispositional flow of college students with respect to gender.

More specifically, we found that exercisers in the action and maintenance stages reported more self-determined motivation (intrinsic, identified regulation) and introjected regulation than those in the preparation stage. These findings are partially consistent with our original hypothesis and with the SDT contention that free choice behaviors can be predicted by more autonomous motives. The results of the present study are in line with those reported by previous research.[34,37] It is interesting that introjected regulation was also observed to be higher in action and maintenance stages. The higher mean introjected regulation scores observed in these more advanced stages of behavior change was unexpected on a theoretical basis because introjected regulation is a controlling type of motivation that is often associated with incompatible psychological behavior.[10] Nonetheless, a number of studies have previously reported introjected regulation to be associated with more frequent exercise participation.[6,31]

In the context of the present study, the positive association between introjected regulation and exercise behavior may be explained by the internalization processes postulated in organismic integration theory. Specifically, introjected regulation involves the internalization of external controls, which are then applied through self-imposed pressures with the intent of avoid guilt or to sustain self-esteem.[31] Accordingly, controlled motivation can be internalized and converted into autonomous motivation, if supportive conditions are in place.[13] The participants may experience changes in beliefs or evaluations towards an attitude object, or they may be influenced by the social outcomes of adopting a change in behavior.

External regulation and amotivation levels were found to be lower for participants in the exercise maintenance stage, compared to the other stages. External regulation generally

decreases across stages, being higher in the preparation stages than in the maintenance stage,[28,38,39] although no stages of change differences in external regulation have been observed in some studies.[23] Lower levels of amotivation were also expected in later stages of behaviour change because a systematic review of literature revealed no evidence of a positive association between motivation and exercise behavior[10], and because individuals in the earlier stages of exercise behavioural change tend to focus on the negative aspects of exercising and fail to recognize the benefits.[40] It is unsurprising, therefore, that the active exercisers taking part in this investigation reported very low levels of amotivation relative to exercise. Overall, the results of this study largely supported our hypotheses, which postulated that compared with controlling and amotivated regulations, autonomous motivation would be higher in more advanced exercise stages of change. Moreover, these results are mostly in line with both the tenets of SDT and its subtheory of organismic integration theory, as well as with extant empirical findings in this area.[26,41]

With regard to dispositional flow, participants in the preparation stage of change reported scores that were lower on subscales relating to clear goals, total concentration on the task and autotelic experience than participants in the maintenance stage. There has been little research to examine patterns of change in the forms of optimal experiencial states occurring in exercise behavior but our findings are consistent with what was observed in previous reports. Ersoz[42] reported higher scores in most subscales of DFS-2 in the action and maintenance stages than in the preparation stage while Mannell, Kaczynski and Aronson[43] found that adolescents participating more frequently in physically active leisure were more likely to experience flow in their physical activity engagement than youth who were less physically active.

The other purpose of this study was to examine relationships between behavioral regulations and dispositional flow in exercise. Dispositional flow may relate to individuals'

behavioral regulations from the framework of SDT. We found that dispositional flow was related significantly and positively with intrinsic, identified and introjected regulations and related negatively with external regulation and amotivation. These results suggest that self-determined motivated exercisers may experience more positive states and enjoy their exercise sessions to a greater degree.

Studies of physical activity behavior have revealed that intrinsic motivation is positively associated with flow.[7,18] Jackson[17] claimed that flow could lead to high enjoyment in physical activity. Deci and Ryan[7] also suggested that when people are highly interested in what they are doing, flow is likely to occur more often. Jackson and Roberts[44], as well as, Kowal and Fortier[16] have presented evidence indicating that intrinsic motivation and self-determined behavior are positively associated with the experience of flow. The flow dimension of autotelic experience, defined as an intrinsically rewarding experience, showed the strongest relationship with intrinsic motivation to experience stimulation.[45] In present study, there was a strong positive relationship between intrinsic regulation and autotelic experience. Jackson and Csikszentmihalyi[46] found that autotelic experience is the flow dimension most closely aligned to intrinsic motivation. Similarly, some sport studies have indicated that self-determined motivation has a positive relationship with the disposition to experience flow.[16,28]

On the other hand, studies have tended to be consistent in showing negative associations between external behavioral regulations and flow[42,47] although Mannell, Zuzanek, and Larson[43] have reported that the highest experience of flow in leisure activities in their studies occurred among extrinsically motivated individuals freely chosing to participate. As observed in our study, Stavrou[47] and Kowal and Fortier[16] found amotivation to be negatively related with flow experience. Stavrou[47] even claimed that amotivated states prevent or disturb flow. Martin and Cutler[48], however, did not observe any significant correlations on this account.

Studies in the area suggest that there are differences in the exercise motives reported by

women and men. Some researchers reported that females were motivated to exercise with autonomous regulations and males were more externally regulated and amotivated.[38,41] Mullan and Markland[26] observed women to have lower levels of self-determined motivation than males in exercise settings. Daley and Duda[49] also found that males had lower amotivation and higher identified and intrinsic regulations than females in physical activity engagement.

In this investigation, exercisers appeared to have similar dispositions to experience flow regardless of gender. Previous studies examining differences in dispositional flow of exercisers with respect to gender are limited. Ersoz[42] has conducted one of the few studies of dispositional flow with regard to gender in young exercisers. On average, she observed higher scores for males than females on the subscales relating to challenge-skill balance, action-awareness merging, clear goals, unambiguous feedback, total concentration on the task at hand, sense of control, autotelic experience. Most other researchers have investigated dispositional flow among athletes relative to their sport involvements.[28,50] Murcia et al.[28] suggested that men had higher scores in dispositional flow than women. No significant gender differences were found in dispositional flow, which supported previous research findings.[50,51] It appears that male and female athletes experience flow in sports in similar ways.

Limitations

The study was limited to university students who took part in preparation, action or maintenance stages of exercise involvement. This study was also limited in that it used only quantitative methods to examine reasons for participating in exercise. Quantitative methods of data collection are limited by the inability to obtain additional information from further inquiry with participants for clarification.[51] Although stages of change have been used as a behavioral measure of exercise participation in many previous studies, it has the same

limitations as other self-report measures. Another limitation can be found in the unequal sample size distribution across the stages of change which may have implications for the generalizability of study findings. Moreover, the results are limited by the absence of BREQ-2 measurement of integrated regulation which means that motivational regulation relative to personal values and identity-relevant commitments of the exercisers participating in this study were not assessed. It would be interesting to examine the relationship between different psychological characteristics of exercisers (exercise motivation and dispositional flow) and exercise behavior using more objective measures of the latter.

Conclusion

In conclusion, the findings have demonstrated that college students are more self-determined in the regulation of their exercise behavior in the latter stages of change. We also found that introjected regulation was positively related to adaptive behavioral outcomes. Conversely, students extrinsically motivated to exercise, or who have a higher degree in amotivation, were in the early stages of change. Additionally, individuals adhering to a regular exercise program have higher scores in clear goals, total concentration on the task at hand, and autotelic experience dimensions of dispositional flow. However, as expected, the behavioral regulations of exercisers were related to their dispositional tendencies to experience flow in this study. Self-determined (autonomous) behavioral regulations may facilitate the flow experiences while controlling behavioral regulations and amotivation may inhibit this experience. It is reasonable to conclude that the promotion of self-determined motivation and flow experience in exercise contexts may serve to foster exercise behavior among college students. The accumulation of knowledge on this account should be helpful for practitioners working in college health and wellness services or recreation centers in understanding college students' underlying participation motivation so as to identify their motivational needs and understand their feelings in exercise and participation in physical activity. Additionally,

evidence suggests that acute and chronic exercise can improve cognitive and executive function[52] so the promotion of exercise behavior in college students may also provide benefits in their academic efforts.

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