

The relationship of Physical Activity level and behavioural regulation to exercise in a student population

Introduction

Physical activity (PA) is an integral component in promoting physical and psychological health, but university students remain one of the least active groups. The transition to higher education is a stressful time with a higher academic burden, more life disturbance, and fewer structured physical activity opportunities (Pauline, 2013; Nelson et al., 2007). Given the decrease in PA levels, knowledge regarding the motivational factors that promote or impair exercise among younger adult populations, may be helpful in developing accessible and motivating opportunities for PA. The motivation to exercise is complex. Self-Determination Theory (SDT) offers a strong analytic lens for shaping and understanding the quality of behavioural regulation that is central to PA participation. (Ryan & Deci, 2019). SDT suggests motivation can range from amotivation (lack of intention) to controlled motivation (external and introjected regulation) and lastly to autonomous motivation (identified, integrated, and intrinsic regulation). Autonomous motivation, created through the satisfaction of autonomy, competence, and relatedness needs, is positively associated with long-term adherence to exercise (Ryan & Deci, 2019; Wilson et al., 2013). Studies have shown that university students with more PA participation display higher autonomous motivation. Sevil et al. (2016) found intrinsic and identified regulation as predictors of moderate-to-vigorous physical activity (MVPA), and barriers such as lack of time, low confidence, or limited access to facilities as limits to movement. Similarly, Lauderdale et al. (2015) revealed that intrinsic motivation significantly predicted PA levels among students. Gender differences were also evident, with male students displaying more performance- and competition-oriented motivations. Another line of research beyond SDT is the role of self-efficacy, emotion, and mood in PA participation. Self-efficacy in PA behaviour—confidence in one's ability to initiate and maintain exercise—predicts PA behaviour especially well, particularly in challenging circumstances (Bandura, 1997; Pauline, 2013). Emotion and mood responses to physical activity may also serve as regulators: positive affect enhances the drive to exercise, while negative affect may discourage engagement (Lane et al., 2011). There are also demographic differences in exercise motivation. Men do more vigorous PA and are motivated by strength, competition, and social validation, whereas women are more motivated by appearance, weight loss, and stress reduction (Kilpatrick et al., 2005; Pauline, 2013). These variations suggest that PA promotion needs to respond to gender differences. While many studies currently link motivation and PA, this literature does not examine

differences in behavioural regulation profiles among low-, moderate-, and high-activity students, measured using both SDT and BREQ-3 simultaneously. This study fills this critical gap by examining the association between motivation type and IPAQ-classified levels of physical activity in a university student sample.

Method

Participants

The participants were undergraduate students at University of Wales Trinity Saint David. Students voluntarily completed two measures: the Behavioural Regulation in Exercise Questionnaire-3 (BREQ-3) (Markland & Tobin, 2004), this is an established benchmark for this type of measure, and the International Physical Activity Questionnaire – Short Form (IPAQ-SF), a popular form of assessment. Students were organised into low, moderate, and high physical activity groups as per IPAQ scoring procedures.

Design and Measures

The study was cross-sectional and used a questionnaire design. Behavioural regulation was assessed with six SDT-based subscales:

Amotivation

External regulation

Introjected regulation

Identified regulation

Integrated regulation

Intrinsic regulation

IPAQ-SF criteria were used to classify PA level. Motivational profiles were compared across the various PA groups in the study.

Procedure

Students filled out questionnaires in typical classes or online. Responses were anonymised, and the data were analysed. A bar chart (Figure 2) has been produced to visually compare motivational profiles of PA. (Figure 1)

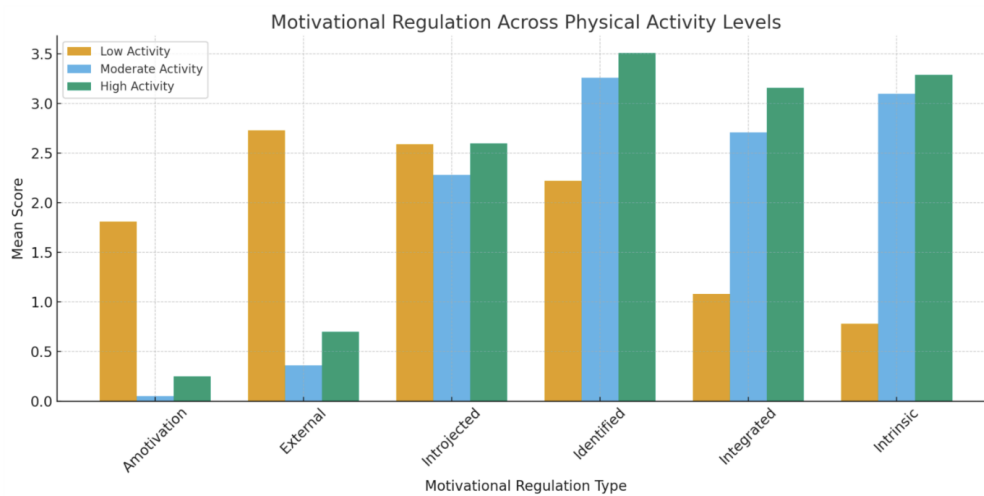
Figure 1

Activity Level	Amotivation (SD)	External Regulation (SD)	Introjected Regulation (SD)	Identified Regulation (SD)	Integrated Regulation (SD)	Intrinsic Regulation (SD)
Low	1.45	1.12	0.76	0.76	1.10	1.08
Moderate	0.13	0.45	1.00	0.58	1.23	0.56
High	0.64	0.98	1.01	0.47	0.77	0.64

Means and Standard Deviations for Each Regulation Type

Activity Level	Amotivation (Mean)	External Regulation (Mean)	Introjected Regulation (Mean)	Identified Regulation (Mean)	Integrated Regulation (Mean)	Intrinsic Regulation (Mean)
Low	1.81	2.73	2.59	2.22	1.08	0.78
Moderate	0.05	0.36	2.28	3.26	2.71	3.10
High	0.25	0.70	2.60	3.51	3.16	3.29

Figure 2



Results

Analysis revealed substantial differences in relation to motivational regulation across low, moderate and high PA groups.

Low Activity Group

This is how students with low PA levels assessed themselves:

Highest amotivation ($M = 1.81$)

High external regulation ($M = 2.73$)

Moderate introjected regulation ($M = 2.59$)

In the low activity group, integrated and intrinsic regulation were low which suggest little internalisation of exercise motives. This data reveals that low-activity students depend on controlled motives to obtain exercise gain and lack intrinsic value and enjoyment

Moderate Activity Group

Students of moderate activity reported:

Very low amotivation ($M = 0.05$)

Low controlled motivation

Results for higher identified ($M = 3.26$), integrated ($M = 2.71$), and intrinsic regulation ($M = 3.10$)

This is also consistent with high autonomous motivation.

High Activity Group

Highly active students demonstrated:

Greatest autonomous motivation of all groups

Highly identified ($M = 3.51$), integrated ($M = 3.16$) and intrinsic regulation ($M = 3.29$)

Very low amotivation ($M = 0.25$)

The motivation of this group shows high self-motivation, with drive for exercise greatly internalised.

Conclusions

The results are consistent with Self-Determination Theory, and what has previously been found that higher levels of physical activity are significantly related to more autonomous motives. Middle and high PA students showed significantly higher levels of self-reported identified, integrated, and intrinsic regulation demonstrating that they work out because they are intrinsically motivated to do so or enjoy it from a personal basis—in line with SDT's internalisation continuum (Ryan & Deci, 2019).

The increased amotivation and external regulation in the low-activity group corresponds to trends found by Sevil et al. (2016) who found that controlled motivation did not sustain PA. These findings also support Wilson et al. (2013) who linked autonomous motivation with improved fitness outcomes. Wilson stressed that quality rather than quantity of motivation counts. The high-activity group's strong autonomous regulation is consistent with Lauderdale et al. (2015), who found intrinsic motivation to be one of the most important predictors of PA in student populations. High levels of introjected regulation across these groups suggest that guilt-driven motivation is present but not specific to activity. This supports SDT's contention that introjected control leads to unstable patterns of behaviour (Ryan & Deci, 2019).

Mood, Emotion, and Self-Efficacy

When taken alongside evidence on emotion and self-efficacy, the present findings also provide further links to this evidence. Lane et al. (2011) found that healthy emotional states promote autonomy in motivation, whereas negative emotions reduce exercise intentions. Pauline (2013) similarly identified gender differences in self-efficacy, noting higher coping and scheduling self-efficacy in men—predictors of elevated chances for PA. Self-efficacy was not assessed for within this study, but the is comparable compatible with higher self-regulatory confidence amongst more engaged students.

Variations between gender

Commonly, women's motivations are for weight self-management, health and reducing stress, whereas men's are for performance, competition and social recognition (Kilpatrick et al., 2005; Pauline, 2013). These differences indicate an opportunity to tailor protocols and PA opportunities to support and sustain autonomous motivation across genders.

To conclude further. This report shows that the behavioural regulation between levels of physical activity varies among university students. Higher PA levels also have a strong impact on autonomous motivation, further corroborating known SDT-based findings. Interventions to increase PA should be directed toward increasing intrinsic and identified regulation rather than external pressures or guilt-based approaches. Practical implication of these findings within a university could be to support autonomous centred activities and

environments, with a focus to encourage low activity female students as they represent a clear demographic in need of support to work through potential barriers to exercise.

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