Psychology of Sport and Exercise 13 (2012) 133–141

Contents lists available at SciVerse ScienceDirect

Psychology of Sport and Exercise

journal homepage: www.elsevier.com/locate/psychsport

Images of exercising: Exploring the links between exercise imagery use, autonomous and controlled motivation to exercise, and exercise intention and behavior

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ARTICLE INFO

Article history:
Received 25 June 2008
Received in revised form
1 September 2011
Accepted 8 October 2011
Available online 19 October 2011

Keywords:
Exercise
Imagery
Motivation
Self-regulatory strategies

ABSTRACT

Objectives: In the present study, we tested a model examining the relationships between exercise imagery use, motivational regulations for exercise engagement, intention to exercise, and self-reported exercise behavior. This work represents an initial attempt to examine relationships between a new type of exercise imagery (enjoyment imagery) and motivational regulations for exercise.
Design: Cross-sectional.
Method: Exercisers with a mean age of 40.29 years (SD = 13.29; 177 female, 141 male) completed measures of the targeted variables.
Results: Structural equation modeling analyses revealed direct and indirect (via motivational regulations) links between imagery and exercise-related outcomes. Technique and enjoyment imagery were positively related to autonomous motivation. Conversely, appearance imagery was positively associated with controlled motivation. Direct relationships were evidenced between energy imagery and self-reported exercise behavior, and between appearance imagery and intention to exercise.
Conclusions: The potential motivational functions served by different exercise imagery types are discussed, and the inclusion of enjoyment imagery in future exercise imagery research is recommended.

Although it is widely recommended that individuals should aim to engage in at least 30 min of moderate exercise on at least 5 days of the week to improve their health (e.g., Great Britain Department of Health [DH], 2005), survey data reveals that only 37% of men and 24% of women in England are meeting these guidelines, with over a third of adults being inactive (i.e., participating in less than one session of 30 min activity per week; see DH, 2005). Even those who do heed advice to become more physically active are not always successful in the desired behavioral changes. It is commonly estimated that 50% of individuals who commence an exercise program will drop out within the first 6 months (e.g., Dishman, 1988); a statistic which has been supported across diverse demographic profiles including college students, middle-aged and elderly adults, as well as varied settings (e.g., health promotion, worksites) (Robison & Rogers, 1994). Noteworthy, however, is that adherers and dropouts can be differentiated in terms of their self-motivation, with those reporting intrinsic reasons for exercising (e.g., enjoyment) being more likely to maintain exercise behavior (Ingledew, Markland, & Medley, 1998). Collectively, these findings highlight not only a need for raising general levels of physical activity in the population, but also the importance of gaining a better understanding of individuals' motivation to exercise.

One motivational framework that is applicable to the process of behavior adoption and maintenance is self-determination theory (SDT; Ryan & Deci, 2000). Within SDT it is posited that the motives, or regulations, governing behavior vary along a continuum of self-determination ranging from behaviors that are externally controlled to those which are fully autonomous in nature. At the extremes of the continuum are amotivation, a state reflecting a lack of intention to engage in an activity; the opposite of which is intrinsic motivation, a behavioral regulation representing engagement in an activity for the sheer pleasure and satisfaction that may be derived from it (Ryan & Deci). Between these extremes lie four kinds of extrinsic motivation (external regulation, introjected regulation, identified regulation, and integrated regulation).

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doi:10.1016/j.psychsport.2011.10.002

With regard to one's motivation to partake in an activity, Deci and Ryan (2008) argue that the central distinction made within contemporary SDT work is that of autonomous versus controlled motivation. Autonomous behaviors are those represented by the behavioral regulations which encompass a sense of personal volition in behavior (i.e., intrinsic motivation, integrated regulation and identified regulation). Deci and Ryan summarize that autonomous motivation "comprises both intrinsic motivation and the types of extrinsic motivation in which people have identified with an activity's value and ideally will have integrated it into their sense of self" (p. 182).[1] When individuals are motivated for autonomous reasons, their behaviors are initiated and sustained by their own true self, and involve doing what they find important or interesting (Moller, Deci, & Ryan, 2006). In contrast, Deci and Ryan state that controlled motivation "consists of both external regulation, in which one's behavior is a function of external contingencies of reward or punishment, and introjected regulation, in which the regulation of action has been partially internalized and is energized by factors such as an approval motive, avoidance of shame, contingent self-esteem, and ego-involvements" (p. 182). Thus, controlled motivation represents behavior that emanates from feelings of pressure or coercion, which can come from either internal or external sources (Moller et al.). Aligned with Ryan and Deci's (2000) argument that this represents the central distinction of motivation within SDT, a number of recent exercise studies have grouped participant responses into autonomous versus controlled regulations within their analyses (e.g., Barbeau, Sweet, & Fortier, 2009; Standage, Sebire, & Loney, 2008; Wilson, Blanchard, Nehl, & Baker, 2006).

Across many contexts such as clinical, health, and academic settings (see Deci & Ryan, 2008; Ryan & Deci, 2000), it has consistently been shown that behaviors engaged in for autonomous reasons (as opposed to controlled), result in more adaptive outcomes (e.g., greater behavioral persistence, and increased well-being). The tenets of SDT have been increasingly supported in exercise settings where it has been found that autonomous forms of motivation (consisting of intrinsic motivation and identified regulation) positively predict higher levels of self-reported exercise behavior (e.g., Wilson et al., 2006), as well as predicting greater engagement in objectively-assessed bouts of moderate intensity exercise behavior (Standage et al., 2008).

Research findings pertaining to more controlled behavioral regulations (consisting of external regulation and introjected regulation) within SDT have shown a fairly inconsistent pattern of associations with respect to both intention to exercise and exercise behavior. With regard to exercise behavior, while Wilson, Rodgers, and Fraser (2002) found a significant negative association between external regulation and self-reported moderate exercise behavior, other research has found a nonsignificant association between these variables (e.g., Edmunds, Ntoumanis, & Duda, 2006). Further, some research has supported a positive relationship between introjected regulation and total self-reported exercise behavior (e.g., Edmunds et al.). In contrast, past work has also evidenced nonsignificant relationships between both external and introjected regulations and total self-reported exercise behavior (e.g., Wilson, Rodgers, Blanchard, & Gessell, 2003). Importantly, when using an objective assessment of exercise behavior, Standage et al. (2008) reported no relationship between controlled motivation toward exercise (i.e., a composite score of external and introjected regulations) and engagement in bouts of moderate intensity exercise behavior.

Research focusing on intention to exercise has found introjected regulation to be positively associated with exercise intentions in adults (e.g., Wilson & Rodgers, 2004) and young people (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003). However, a nonsignificant relationship between external regulation and exercise intention in both of these studies was reported. Other research (e.g., Chatzisarantis, Biddle, & Meek, 1997) suggests external regulation can be important in young people developing strong intentions to exercise outside of school.

Based on such work, the issue of importance therefore becomes how to create conditions that will foster the internalization of exercise behavior. According to SDT (Ryan & Deci, 2000), individuals are active agents driven by a natural tendency to internalize the regulation of their behavior. That is, if provided with appropriate social environs (e.g., autonomy-supportive context), they will seek to transform originally external reasons for performing an activity, and assimilate and integrate these reasons with the self over time. Green-Demers, Pelletier, Stewart, and Gushue (1998) suggest that the use of psychological strategies can contribute to the internalization of target behaviors. In support of this proposal, they found that figure skaters' use of interest-enhancing strategies (e.g., setting long-term goals, adding variety to training) positively predicted interest in training tasks, with interest levels in turn positively predicting self-determined motivation. Their findings suggest that the employment of psychological strategies plays a role in the internalization process. Contemporary research highlights the need to establish psychological strategies and interventions which are effective in this regard in terms of exercise behavior (e.g., see Edmunds et al., 2006).

Imagery has long been considered to be an effective performance enhancement tool for athletes. It has also been recognized as a potential self-regulatory strategy for exercisers to enhance motivation and self-efficacy (e.g., Giacobbi, Hausenblas, & Penfield, 2005). The growth of research in exercise imagery has occurred largely in response to Hall's (1995) assertion that imagery could have a positive influence on the cognitions and motivation of exercisers. Hall suggested that exercisers might imagine participating in their favorite forms of exercise, and achieving their exercise goals. In the subsequent development of the Exercise Imagery Questionnaire (EIQ), Hausenblas, Hall, Rodgers, and Munroe (1999) identified three main types of imagery utilized by exercisers: (a) appearance imagery (i.e., imagining oneself becoming healthier and improving one's physical appearance), (b) energy imagery (i.e., imagining oneself being energized and ready to exercise); and (c) technique imagery (i.e., imagining the correct execution of exercise form/technique). Research employing the EIQ has found specific patterns of imagery use among exercisers. High frequency exercisers tend to use imagery more than low frequency exercisers, and appearance imagery is the most frequently used imagery type (Gammage, Hall, & Rodgers, 2000). Gender differences have also been reported, with males reporting significantly higher use of technique imagery than females, and females reporting significantly higher use of appearance imagery than males (Gammage et al.). Moreover, the EIQ has revealed that frequency of exercise imagery use positively predicts greater exercise behavior and intention to exercise (for a review see Munroe-Chandler & Gammage, 2005).

The EIQ has previously been used in an exercise imagery study guided by the theoretical tenets of SDT (Wilson, Rodgers, Hall, & Gammage, 2003). All three types of exercise imagery were positively associated with both controlled and autonomous forms of exercise regulation in a sample of 165 female exercisers. Via results from a canonical correlation analysis, these authors concluded that

[1] Integrated regulation is also suggested as a type of extrinsic regulation in the SDT continuum, reflecting a state in which an individual has integrated motivation toward an activity into their sense of self, aligned with their other needs and values (Deci & Ryan, 2008; Ryan & Deci, 2000). Most questionnaires assessing motivation from a SDT perspective in exercise do not include an integrated regulation subscale (including the BREQ-2 employed in this study). Consequently this behavioral regulation does not receive detailed description in this manuscript.