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Review

Self-determined motivation and physical activity in children and adolescents: A systematic review and meta-analysis

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ABSTRACT

Objective: Self-determination theory is used as a framework for examining the relation between motivation and physical activity. The purpose of this review was to systematically review studies that assessed the association between self-determined motivation and physical activity levels in children and adolescents.

Method: We searched electronic databases in April 2013. Included studies assessed the relation between motivation (as outlined in self-determination theory) and physical activity in children and adolescents.

Results: Forty-six studies ($n = 15{,}984$ participants) met the inclusion criteria. Meta-analysis indicated that overall levels of self-determined motivation had a weak to moderate, positive associations with physical activity ($\rho = .21$ to $.31$). Autonomous forms of motivation (i.e., intrinsic motivation and identified regulation) had moderate, positive associations with physical activity ($\rho = .27$ to $.38$), whereas controlled forms of motivation (i.e., introjection and external regulation) had weak, negative associations with physical activity ($\rho = -.03$ to $-.17$). Amotivation had a weak, negative association with physical activity ($\rho = -.11$ to $-.21$).

Conclusions: Evidence provides some support for self-determination theory tenets. However, there was substantial heterogeneity in most associations and many studies had methodological shortcomings.

Contents

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Introduction

Physical activity (PA) is associated with numerous health benefits in children and adolescents. For example, PA has positive effects on cholesterol and blood lipids, blood pressure, metabolic syndrome, overweight and obesity, bone mineral density, and depression (Janssen and LeBlanc, 2010). In addition, PA has positive relations with children and adolescents' academic performance and mental health (Biddle and Asare, 2011; Singh et al., 2012). Many children and adolescents, however, do not currently participate in sufficient levels of PA to acquire these benefits (Department of Health and Ageing, 2008; Troiano et al., 2008). As a result, PA promotion among young people has been identified as a global health priority (World Health Organisation, 2010).

Motivation is an important correlate and potential determinant of PA (Ng et al., 2012). The importance of different types of motivation (known as behavioral regulations) underpinning PA behavior, has become a prominent area of research over the past decade (Ng et al., 2012). Self-determination theory (SDT; Deci and Ryan, 1985) has emerged as popular framework for examining the relation between motivation and PA. The theory differentiates between controlled and autonomous forms of motivation. Five motivation regulations exist over these two categories and fall onto a systematically varying continuum, depending of the degree of self-determination present.

Autonomous forms of motivation include intrinsic motivation, integrated regulation, and identified regulation. Intrinsic motivation exists when the behavior is viewed as interesting or enjoyable. Integrated regulation, defined as acting because the behavior aligns with personal values and one's sense of self, is the most autonomous form of extrinsic motivation. Identified regulation exists when the outcomes of a behavior are viewed as personally beneficial and important; this regulation is also considered an autonomous form of extrinsic motivation (Deci and Ryan, 1985).

Controlled forms of motivation include external regulation and introjection. External regulation involves acting to obtain a reward or avoid punishment, whereas introjection occurs when feelings of guilt or contingent self-worth drive behavior. A final category, amotivation, refers to an absence of motivation (Ryan and Deci, 2000).

According to SDT, autonomous forms of motivation will be positively related to sustained health-promoting behaviors, such as PA, whereas controlled forms of motivation will not promote these behaviors over the long term. A recent meta-analysis examined this association in adults (Teixeira et al., 2012). However, no previous review has examined the relation between self-determined motivation and PA in children and adolescents. Due to the current low levels of PA in children and adolescents, it is critical that we determine whether interventions targeting autonomous motivation are likely to be effective in promoting PA in children and adolescents. Therefore, the aim of this study was to calculate effect sizes pertaining to relations between SDT-based motivation regulations and PA behavior of children and adolescents. In line with SDT tenets, we hypothesized that more autonomous forms of motivation would have stronger positive relations with PA behavior, whereas, more controlled forms of motivation would show stronger negative relations with PA behavior. We also identified and tested potential moderators of these effect sizes, such as measurement tools, study design, type of PA measure used, risk of bias within studies, and publication status.

Method

Eligibility criteria

To be included in this review, studies were required to include: a) participants with a mean age between 5 and 18 or were enrolled in either primary or secondary schools, b) quantitative assessment of at least one form of motivation outlined in SDT (e.g., intrinsic motivation), an overall score of self-determination (i.e., Relative Autonomy Index; RAI; Ryan and Connell, 1989), a composite measure of autonomous motivation (e.g., mean of the intrinsic motivation and identified regulation subscales; McDavid et al., 2012), or a composite measure of controlled motivation (e.g., mean of introjection and external regulation subscales; Bagoien and Halvari, 2005), c) quantitative assessment of PA (e.g. observation, self-report, accelerometer, pedometer, heart rate), d) quantitative assessment of the relation between scores derived from measures of motivation and PA, and e) a cross-sectional, cohort, or experimental/quasi-experimental study design. Studies involving special populations (e.g., children and adolescents with autism) were excluded from the review. All full-text articles meeting these criteria published in the English language between 1980 and April 2013 were included.

Information sources

Searches were conducted within PubMed, Psych Info, Scopus, and Sport Discus up to April 18th, 2013. Systematic combinations of two groups of keywords were used to identify eligible studies: a) self-determination OR self-determination theory OR self-determined motivation OR autonomous motivation OR controlled motivation OR intrinsic motivation OR extrinsic motivation; AND b) physical activity OR exercise OR fitness OR movement.

Search results were exported into Endnote reference manager software and duplicates removed. The titles and abstracts of these studies were independently screened by two researchers for eligibility. Any discrepancies regarding criteria fulfillment were resolved by discussion between the two researchers and a third investigator until consensus was reached. Next, reference lists of the eligible studies were reviewed to identify additional studies. Full-text articles of these studies were retrieved; when they were unobtainable, we contacted authors of the paper to request a copy of the paper or the information required for the analyses. Further, to include studies that may not be included in these databases (e.g., theses, unpublished datasets, in-press publications), the authors posted a message on the Self-Determination Theory and SPORTPSY electronic mailing lists, requesting that researchers provide such information to be included in the meta-analysis.

Data extraction

The relations between SDT-based motivation variables and PA were extracted. These motivation variables included: (1) overall level of self-determined motivation (measured with the RAI); (2) intrinsic motivation; (3) integrated regulation; (4) identified regulation; (5) introjection; (6) external regulation; (7) amotivation; (8) composite autonomous motivation; and (9) composite controlled motivation. Many studies assessed the relation between motivation and activity in more than one life context. For example, multiple studies examined the association between motivation towards physical education (PE) and PA behavior during leisure time, as well as the relation between motivation towards leisure time PA and PA behavior within the same context. In these instances, both results were extracted.

Summary measures and synthesis of results

Zero order correlations were extracted and guidelines for interpreting the strength of the correlations (r) were .1 (weak), .3 (moderate), and .5 (strong) (Cohen, 1988). The meta-analytic procedures suggested by Hunter and Schmidt