Reliability and validity of the BREQ-2 for measuring high school students' motivation for physical education

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INTRODUCTION

Contemporary research into motivation in the physical domains of sport, exercise and physical education has witnessed the emergence of Self-determination Theory (Deci & Ryan, 2002). The aim of Self-determination Theory is to help understand motivation and behavior that originates from differences in motivational orientations, contextual influences and interpersonal perceptions. A central aspect of the evolution of Self-determination Theory is the discrimination between autonomous and controlling forms of motivation (Hagger & Chatzisarantis, 2008). Latterly, Self-determination Theory has been linked to physical education to enhance understanding of students' motivation (Shen et al, 2009). Autonomous forms of motivation are associated with sustained engagement in physical activity (Chatzisarantis et al, 2002). An earlier version of the Behavioral Regulation in Exercise Questionnaire (BREQ) (Mullan, Markland & Ingeldew, 1997) was adapted to measure autonomous motivation in physical education (Hein & Hagger, 2007) but the BREQ-2 instrument (Markland & Tobin, 2004) has not been validated for use in this context.

PURPOSE

To test the reliability (internal consistency and parallel forms) and validity (known groups and structural validity) of the BREQ-2 for use in high school physical education settings.

METHODS

10th-grade students (*N* = 424) completed a 10-15 minute online version of the BREQ-2 in a classroom setting. 29 students also completed a paper version of the BREQ-2 one month later. Internal consistency reliability and parallel forms reliability (online vs. paper) were assessed using intraclass correlation coefficients (*ICC*). Known-groups validity was assessed by comparing scores of students who elected to study physical education subsequently (*n* = 133) to students who did not elect to study physical education (*n* = 249). Construct validity was assessed by testing the original 5-factor correlated structure of the BREQ-2 using confirmatory factor analysis (CFA).

Table 1. Item-factor loadings

Item	Factor	Loading
I5	Am	.84
I9	Am	.77
I12	Am	.90
I19	Am	.89
I1	ExR	.53
I6	ExR	.66
I11	ExR	.59
I16	ExR	.66
I2	InR	.74
I7	InR	.78
I13	InR	.69
I3	IdR	.80
I8	IdR	.81
I14	IdR	.83
I17	IdR	.52
I4	InM	.84
I10	InM	.88
I15	InM	.92
I18	InM	.84

Table 2. Inter-factor correlations

	Am	ExR	InR	IdR	InM
Am					
ExR	.39				
InR	-.29	.36			
IdR	-.74	-.11	.65		
InM	-.74	-.19	.51	.91	

Notes. Am = Amotivation; ExR = Extrinsic Regulation; InR = Introjected Regulation; IdR = Identified Regulation; InM = Intrinsic Motivation

RESULTS

Internal consistency reliability ranged from *ICC* = .69 to .93 (median *ICC* = .83). Parallel forms reliability ranged from *ICC* = .66 to .89 (median *ICC* = .83), and mean scores were not significantly different ($p > .05$) between forms for any subscale nor for the overall scale score. Students who elected to study physical education scored significantly ($p < .001$) and meaningfully (median effect size = 1.00) differently on all subscales and overall scale score, in the theoretically-predicted direction, compared to students who elected not to study physical education. Overall fit of the 5-factor correlated model was good ($\chi^2_{(142)} = 350.13$; TLI = .95; CFI = .96; RMSEA = .06), and item-factor loadings were generally high (range = .52 - .92; median = .80).

CONCLUSIONS

These results indicate strong evidence of internal consistency reliability and parallel forms reliability of an online measure of high school students' autonomous motivation for physical education. Known-groups evidence and confirmatory factor analysis showed strong external and factorial validity of the measure. For determining high school students' motivation for physical education, researchers and practitioners can feel confident that the BREQ-2 measures multiple components of motivation, provides replicable data, and can be used in either paper form or online form without method bias.

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