

MEASURING STUDENT RESPONSIBILITY IN PHYSICAL EDUCATION: EXAMINATION OF CSR AND PSR MODELS

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ABSTRACT

The Contextual Self-Responsibility Questionnaire (CSRQ) and Personal and Social Responsibility Questionnaire (PSRQ) were developed to measure student responsibility within the field of physical education. In the present study, the factor structure of the CSRQ and PSRQ was examined. Unlike previous structure examination studies, it was hypothesised that two models would not fit the data due to the existing limitations of the CSRQ and PSRQ. The results of the confirmatory factor analysis (CFA) showed an extremely poor model fit to the data. In conclusion, supportive psychometric evidence of these two models could not be provided. It is, therefore, necessary to develop a new instrument for measuring student responsibility within the field of physical education.

Key words: Contextual Self-Responsibility Questionnaire (CSRQ); Personal and Social Responsibility Questionnaire (PSRQ); Factor structure scale; Validity.

INTRODUCTION

Taking responsibility for students and others' well-being has been regarded as essential for physical education (Quay & Peters, 2008; Gordon, 2010; Walsh *et al.*, 2010). Hellison's (2011) teaching personal and social responsibility model (TPSR) is grounded in the notion that teachers can use physical activity as a vehicle to promote responsibility among adolescents. There are five major levels of TPSR, namely respect for the rights and feelings of others, effort and cooperation, self-direction, helping others and leadership, and transfer outside the gym (Hellison, 2011). Teachers help students to learn all levels related to responsibility with the appropriate program design. Previous studies have supported that the TPSR is highly effective in promoting adolescents' responsibility (Hellison & Walsh, 2002; Hellison & Wright, 2003; Walsh, 2007; Walsh, 2008; Wright & Burton, 2008; Lee & Martinek, 2009).

However, previous studies have reported that there is insufficient quantitative evidence supporting TPSR outcomes (Schilling, 2001; Hellison & Walsh, 2002; Mrugala, 2002; Hellison & Martinek, 2006). Recently, there has been some quantitative research assessing the TPSR, such as a 'coaching club' program implemented by Walsh *et al.* (2010) using attendance records of students as the indicator of responsibility development. Wright *et al.* (2010) used the students' absence and tardiness records and grades as indicators. Gordon (2010) implemented the TPSR in a physical education class for six months and used self-examination results as an indicator. This aforementioned research involved small-scale case studies. Although these

studies contributed much to this line of research and practical applications of the TPSR, their inferential potential is limited.

To better assess adolescent responsibility through the TPSR, it is necessary to conduct large-scale research based on larger sample sizes. Therefore, the development of a reliable and valid instrument for assessing adolescent responsibility is warranted. There are two existing instruments measuring responsibility among studies related to the TPSR: the Contextual Self-Responsibility Questionnaire (CSRQ) developed by Watson *et al.* (2003); and the Personal and Social Responsibility Questionnaire (PSRQ) developed by Li *et al.* (2008).

The CSRQ is a self-report questionnaire with a total of 15 items. Watson *et al.* (2003) surveyed 130 adolescents participating in a TPSR program, and data were analysed with an exploratory factor analysis (EFA). Results showed that three factors were extracted, which were labelled 'care for others/goal setting', 'self-responsibility', and 'self-control/respect'. Results also showed that some items did not load onto the expected factors, and some items, such as "I tried hard" loaded onto multiple factors. In addition, the extracted factors included constructs with significantly different meanings. For instance, 'care for others' and 'goal setting' were two completely different concepts. As Li *et al.* (2008) commented on CSRQ, the concept of 'self-responsibility' was vague and this concept may contain elements of other factors.

The PSRQ is also a self-report questionnaire with a total of 14 items. Li *et al.* (2008) assessed 253 high school students using this instrument, and preliminary CFA and internal-consistency results supported the validity and reliability of this measure. The PSRQ consisted of two factors, referred to as 'personal responsibility' and 'social responsibility.' 'Personal responsibility' contained two levels of TPSR: 'effort' ("I try hard") and 'self-direction' ("I want to improve"). 'Social responsibility' contained another two levels of TPSR: 'respect' ("I respect others") and 'caring and helping' ("I encourage others"). Generally, the PSRQ constitutes a new development for the conceptualisation of personal and social responsibility.

Nevertheless, the PSRQ also has some defects, with the items "I set goals for myself" and "I do not make any goals" being too similar to each other. The item "I control my temper" loaded onto the social responsibility factor; however, temper control may sometimes be just a personal issue and not necessarily related to others (Hellison, 2011). Furthermore, "I respect others" and "I respect my teacher" overlapped due to the former item perhaps containing aspects related to respect for both classmates and teachers.

The CSRQ and PSRQ have been assessed in past studies (Newton *et al.*, 2006; Lee *et al.*, 2012). Newton *et al.* (2006) suggested that the generalizability of the CSRQ be examined since factors were extracted only via an EFA. Lee *et al.* (2012) also reported that the two-dimensional structure of the PSRQ was not convincing due to the absence of a theoretical rationale. Although research has already shown the limitations of these two measures, re-examination of the factorial structure through an empirical approach is still necessary. To date, no study has conceptually tested the CSRQ and PSRQ dimensions with an empirical approach, using confirmatory factor analysis (CFA). Therefore, two sub-studies were conducted to examine whether the three-dimensional structure of the CSRQ and the two-dimensional structure of the PSRQ could be confirmed.

PURPOSE OF THE STUDY

Specifically, the purpose of Sub-study 1 was to examine the factor structure of the CSRQ. The purpose of Sub-study 2 was to examine the factor structure of the PSRQ. As mentioned, there are some limitations in the concepts and application of the CSRQ and PSRQ. It was hypothesised that the models derived from previous studies would not provide adequate fit to the data.

METHODOLOGY

Participants

For Sub-study 1, the participants (n=280) consisted of 152 males and 128 females between the age of 14 and 16 years (M=15.2, SD=1.04), from 5 middle schools. For Sub-study 2, 305 students (170 males, 135 females), between the age of 14 and 16 years (M=15.4, SD=0.96), were also selected from 5 different middle schools. Prior to data collection, students were briefed on the purpose of the questionnaire. All participants were informed that their responses would be confidential and only used for research purposes. Students who decided not to respond after reading the consent form and questionnaire had the option to return the questionnaire form blank.

Measures

The Contextual Self-Responsibility Questionnaire (*CSRQ*) of Watson *et al.* (2003) was assessed in Sub-study 1. The students in this study responded to 15 items (*Care for Others/Goal Setting*, *Self-Responsibility*, and *Self-Control/Respect* with 5 items each), measured on a scale ranging from 1 (strongly disagree) to 4 (strongly agree). Each item followed the stem "I take part in PE". Example items are "I supported the others in my group" (*Care for Others/Goal Setting*), "I participated even when I didn't want to" (*Self-Responsibility*), and "I was able to control what I did" (*Self-Control/Respect*). The Personal and Social Responsibility Questionnaire (*PSRQ*) of Li *et al.* (2008) was assessed in Study 2. The students in this study responded to 14 items (*Social responsibility*, and *Personal responsibility* with 7 items each) measured on a scale ranging from 1 (strongly disagree) to 6 (strongly agree). Each item also followed the stem "I take part in PE." Example items are: "I am kind to others" (*Social responsibility*) and "I set goals for myself" (*Personal responsibility*). Only 1 item "I do not make any goals" in the PSRQ was worded negatively.

Data analysis

Confirmatory Factor Analysis (CFA) was employed using AMOS in Sub-studies 1 and 2. To evaluate model fit, several model fit values have been assessed (Hu & Bentler, 1999; Jackson & Gillaspay, 2009), such as the comparative fit index (CFI), the root-mean-square error of approximation (RMSEA), and the Tucker-Lewis index (TLI). For the CFI and TLI indices, values greater than 0.90 are typically considered acceptable, and values greater than 0.95 indicate good fit to the data. For the RMSEA index, a value less than 0.08 is acceptable and less than 0.06 indicates good fit to the data (Browne & Cudeck, 1993; Byrne, 2001; Marsh *et al.*, 2004). Descriptive statistics (M and SD), Cronbach's alpha coefficients, and Pearson's product moment correlations were computed.

RESULTS

Sub-study 1

Means of the 3 CSRQ factors ranged from 2.39 to 2.84. The standard deviations ranged from 0.40 to 0.49. Univariate skewness (ranged from -0.65 to -1.23) and kurtosis (ranged from 0.56 to 1.62) values indicate that the observed variables were approximately normal suggesting that the multivariate normality assumption for model testing was not violated (Marshall & Mardia, 1985). Values for means, standard deviations, Cronbach's alphas, and inter-correlations are shown in Table 1.

TABLE 1: DESCRIPTIVE STATISTICS, RELIABILITY COEFFICIENTS AND INTER-CORRELATIONS (Sub-study 1)

CSRQ factors	1	2	3	M±SD	Skewness	Kurtosis	Cr. alpha
1. Care for others/ Goal setting	-	0.46	0.42	2.82±0.40	-1.23	1.62	0.75
2. Self-responsibility		-	0.39	2.84±0.41	-1.12	1.04	0.76
3. Self-control/Respect			-	2.39±0.49	-0.65	0.56	0.65

All correlations are significant at the 0.01 level. Cr. alpha= Cronbach's alpha M= Mean

TABLE 2: FACTOR LOADINGS FOR EACH VARIABLE (Sub-study 1)

Statements	Factor 1	Factor 2	Factor 3
I was concerned for others	0.60		
I set goals	0.67		
I supported the others in my group	0.60		
I was able to set goals	0.56		
I listened to others in my group	0.63		
I participated even when I didn't want to		0.57	
I practiced on my own		0.64	
I took responsibility for what I did		0.63	
I tried to do what the teacher said		0.66	
I tried hard		0.67	
I was able to control what I did			0.44
I controlled my behaviour			0.61
I did not lose my temper; I kept my cool			0.49
I made fun of some of the others			0.50
I respected others			0.63

Factor 1= Care for others/Goal setting; Factor 2= Self-responsibility; Factor 3= Self-control/Respect

To test the CSRQ structure, a CFA with maximum-likelihood estimation was performed. The hypothesised model consisted of 3 latent variables: ‘Care for Others/Goal Setting’, ‘Self-Responsibility’ and ‘Self-Control/Respect’. As seen in Table 2, the standardised loadings ranged from 0.44 to 0.67, which are marginally acceptable. However, the CFA results indicated that the hypothesised factor structure did not have an acceptable fit ($\chi^2=346.21$, $df=87$, $p<0.05$; $\chi^2/df=3.98$; TLI=0.77; CFI=0.81; RMSEA=0.10). The CSRQ structure could not be supported according to the criteria suggested by statistics scholars (Browne, & Cudeck, 1993; Byrne, 2001; Marsh *et al.*, 2004).

Sub-study 2

Means of the 2 PSRQ factors were 4.01 and 3.76 respectively. The standard deviations were 1.04 and 0.96 respectively. Univariate skewness (-0.86 and -0.46) and kurtosis (0.20 and -0.52) values indicated that the observed variables were approximately normal suggesting that the multivariate normality assumption for model testing was not violated (Marshall & Mardia, 1985). Values for means, standard deviations, Cronbach’s alphas and inter-correlations are presented in Table 3.

TABLE 3: DESCRIPTIVE STATISTICS, RELIABILITY COEFFICIENTS AND INTER-CORRELATIONS (Sub-study 2)

CSRQ factors	1	2	M±SD	Skewness	Kurtosis	Cr. alpha
1. Social responsibility	-	0.55	4.01±1.04	-0.86	0.20	0.88
2. Personal responsibility		-	3.76±0.96	-0.46	-0.52	0.83

All correlations are significant at the 0.01 level. Cr. alpha= Cronbach’s alpha M= Mean

TABLE 4: FACTOR LOADINGS FOR EACH VARIABLE (Sub-study 2)

Statements	Factor 1	Factor 2
I respect others	0.77	
I respect my teacher(s)	0.73	
I help others	0.75	
I encourage others	0.78	
I am kind to others	0.80	
I control my temper	0.60	
I am helpful to others	0.69	
I participate in all of the activities		0.63
I try hard		0.81
I set goals for myself		0.72
I try hard even if I do not like the activity		0.67
I want to improve		0.64
I give a good effort		0.83
I do not make any goals		0.24

Factor 1= Social responsibility

Factor 2= Personal responsibility

To test the PSRQ structure, a CFA with maximum-likelihood estimation was performed. The hypothesised model consisted of 2 latent variables: 'Social Responsibility' and 'Personal Responsibility'. As seen in Table 4, the standardised loading of the item "I do not make any goals" is too low, whereas those of other items are marginally acceptable. CFA results indicated that the hypothesised factor structure did not have an acceptable fit ($\chi^2=324.04$, $df=76$, $p<0.05$; $\chi^2/df=4.26$; TLI=0.86; CFI=0.88; RMSEA=0.10). The PSRQ structure could not be supported according to the criteria suggested by statistics scholars (Browne, & Cudeck, 1993; Byrne, 2001; Marsh *et al.*, 2004).

DISCUSSION

Previous structure examination studies (Chen *et al.*, 2009; Li *et al.*, 2011; Bekiari, 2012; Scarpa *et al.*, 2012) within physical education generally hypothesised that the factor structure of existent scales are well supportive. In contrast, the current study hypothesised that the structure of the CSRQ and PSRQ would not show adequate goodness of fit. Even though this approach seems bold, it is reasonable given the existent limitations in the concepts and application of the CSRQ and PSRQ. To make a worthy contribution to this structure-development research related to the TPSR, the generalizability of these two assessments should be examined. Results of current CFAs indicated that the three-dimensional model of the CSRQ and the two-dimensional model of the PSRQ were poor fitting.

The development of the CSRQ was based on the five responsibility levels of the TPSR model (Watson *et al.*, 2003). However, the study sample of Watson *et al.* (merely 130 students who attended a TPSR summer camp), might not have been adequate to assess the validity of the CSRQ. Their validity results are insufficient given that they conducted only a cross-sectional exploratory factor analysis. From their EFA, 'care for others' and 'goal setting' were combined into a single factor, whereas 'care for others' and 'goal setting' were combined into another one. However, the combined concepts were completely different in nature (Li *et al.*, 2008). Compared to Hellison's TPSR model (Hellison, 2011), the eventual results of the CSRQ showed a significant drop in elevation.

The CSRQ was used in a follow-up study. Newton *et al.* (2006) tested the moderating role played by the three-dimensional structure of responsibility between goal constructs (task orientation, ego orientation, task climate and ego climate) and dependent variables (enjoyment, future expectation, sport interest, leader respect). With the overlapping factors of the concept of responsibility, it was difficult to further discuss the results, such as why 'care for others/goal setting' and 'self-responsibility' had moderating effects while 'self-control/respect' did not.

As for the PSRQ, the concepts of 'respect' and 'caring/helping' are associated with others, whereas, the concepts of 'effort' and 'self-direction' are associated with the self. It seems more logical and consistent with the conceptual framework of the TPSR that personal responsibilities and social responsibilities would constitute distinct factors (Li *et al.*, 2008). However, as mentioned in the introduction, the design of the PSRQ items has some deficiencies. Furthermore, according to the TPSR (Hellison, 2003; Li *et al.*, 2008), 'respect' and 'effort' are grounded responsibility levels, which are easier for adolescents to achieve; 'caring/helping' and 'self-direction' are advanced responsibility levels, which are difficult to

achieve. Most adolescents may already possess the responsibility of respect and effort in terms of physical education, while the development of caring and self-direction are relatively immature (Li *et al.*, 2008; Hellison, 2011). Therefore, respect and caring/helping cannot be considered as a single factor related to 'social responsibility.' Similarly, effort and self-direction should not be viewed as a 'personal responsibility' factor.

CONCLUSIONS

There are some limitations in the concepts and application of the CSRQ and PSRQ, making it necessary to revise the instruments or develop new ones. Therefore, it is suggested that future studies should focus on developing a new instrument measuring students' responsibility in physical education. Furthermore, in order to develop a conceptualisation of 'responsibility in a physical education context', interviews should be conducted to develop initial items. To provide more psychometric evidence for these scales, additional factor analytical tests (EFA and CFA), and tests of criterion-related validity, are recommended.

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