

Adolescent Peer Relations Instrument: Assessment of its Reliability and Construct Validity when used with Upper Primary Students

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An increasing awareness of the detrimental effects of single-item scales to measure bullying has recently become apparent. A new multiple-item multiple-scale behavioural measure of bullying was developed for secondary schools by Parada (2000) and found to be a reliable and valid scale for adolescent students. However, it is not known whether a similar instrument would yield sound psychometric properties for younger students and therefore provide a salient measure for those students. The aim of the present investigation is to examine the multi-dimensional and hierarchical structure of the Adolescent Peer Relations Questionnaire (APRI)(Parada, 2000) for upper primary aged students. A total of 894 students from Years 5 and 6 from eight Western Sydney primary schools completed the questionnaire. The APRI contains 36 items, 6 scales, and measures 3 types of bullying (Physical, Verbal, Social) in 2 categories (bullying, being targeted). Each scale (e.g., Bullying Physical) is comprised of 6 items. In addition, this investigation analyses the ability of these 3 types of bullying and being targeted to define 2 global second order factors – Global Bullying, and Global Target. Results from the first- and second order Confirmatory Factor Analyses (CFA) showed excellent results for the APRI. The APRI was as such deemed appropriate for use within the upper primary school years.

Research on bullying has continued to develop over the last 20 years. While intervention and understanding has grown, there has been little development in the area of measurement and analysis. More specifically, only recently have issues of robust instrumentation and advanced analysis of bullying surfaced in bullying literature (Marsh, Parada, Craven, Finger, 2004; Parada, 2006).

For example, bullying literature has advanced with the understanding that bullying can occur in more than one form, with typically 3 being hypothesised (physical, verbal, social). Yet instruments to measure bullying have continued to investigate bullying with the use of single-item measures. Only recently has bullying literature advanced with the inclusion of a multi-item multi-scale behavioural scale. In addition, while some measures have attempted to include behavioural scales, many of these have failed to be rigorously tested. The only measure of bullying we are aware of which has successfully undergone psychometric testing with secondary students, is the Adolescent Peer Relations Instrument – APRI (Parada, 2000, 2006). However, it is not evident how well a modified version of this instrument would measure bullying behaviours of pre-adolescent students.

Bullying: Definition and Implications for Measurement

Bullying has been defined as behaviours executed by one or more people to intentionally inflict harm on others (Parada & Craven, 2002; Schuster, 1996). Researchers tend to agree that this happens repeatedly and in different ways (Crick et al., 2001; Lowenstein, 1977). More recently, bullying has been differentiated from other behaviours used by students which are often mistaken for bullying such as teasing (see Parada, 2000, 2006); and peer conflict (see Finger, Craven, Parada, & Yeung, 2007).

In particular, researchers agree that bullying happens in at least three distinct ways: (1) physical; (2) verbal; and (3) social (Crick et al., 2001; Lowenstein, 1977). However, research to support the three-factor a priori theory has been mostly unsuccessful (e.g. Björkqvist, Lagerspetz, & Kaukiainen, 1992; Crick et al., 2001; Rigby & Slee, 1999; Salmivalli, Kaukiainen, & Lagerspetz, 2000). The only studies to support the specific three-factor structure were found using the psychometrically tested APRI (Marsh, Parada, Craven, & Finger, 2004; Parada, 2006). These studies used structural equation modelling techniques to perform Confirmatory Factor Analysis (CFA) on data from secondary student cohorts. Three factors for bullying and three factors for being targeted were extracted. Reliability estimates for the study conducted by Marsh et al. (2004) ranged from .82 to .93, with similarly high estimates found by Parada (2006). In addition, for both studies, the behavioural items which were used to measure the three a priori factors loaded only on those factors (physical, verbal, and social types) they were designed to measure. Marsh et al. further proposed and found that a second order factor structure was evident. The high correlations between the bullying scales, and the high correlations between the target scales were suggestive of this higher order model. Two second order factors – Global Bullying and Global Target – were defined by the first-order factors and represented a total amount of bullying. While this instrument was designed for secondary students, it is not clear whether a modified version of this measure, including the first- and second order models would serve as a salient measure for younger pre-adolescent children. This research aims to test the psychometric properties of the APRI instrument for Year 5 and 6 students. This investigation has the potential to facilitate advances in on bullying theory, research, and intervention by identifying a psychometrically sound measure of bullying which can be used with pre-adolescent primary school students.

Aims and Hypotheses

The present investigation is designed to improve the accuracy of research to measure and analyse involvement in bullying, including the different types of bullying, as well as total measures of them. A broad overarching question of this investigation is: Is the APRI a reliable and psychometrically sound instrument for Year 5 and 6 primary aged students?

Aims

To test the psychometric properties of the APRI with upper primary aged students to ascertain: (a) reliability; (b) a priori first-order factor structure (six scales - three types of behaviours used to bully others [Physical, Verbal, Social], and three ways of being targeted [Physical, Verbal, Social]), and (c) the a priori second order hierarchical factor structure (whether a total bully and total target scale serve as two second order factors).

Statement of Hypotheses

We hypothesise that (a) the six scales from the APRI (Bullying Physical, Bullying Verbal, Bullying Social, Target Physical, Target Verbal, and Target Social) will be reliable measures, and (b) the a priori six first-order factor structure and two second order factors: Global Bully (Bullying Physical, Bullying Verbal, Bullying Social) and Global Victim (Target Physical, Target Verbal, Target Social) of the APRI will be demonstrated using CFA.

Method

Participants

This investigation was undertaken with 894 primary school students ($n^{\text{male}} = 455$, $n^{\text{Year five}} = 455$), recruited from eight Catholic Education, Diocese of Parramatta Primary Schools (encompassing the Western Sydney Region). Participants comprised Year 5 and 6 students. Responses to the questionnaires were manually assessed for unusual patterns and unreliable data. Responses deemed inappropriate were omitted from the study.

Procedure

Students with parental permission to participate were told about the purpose of the study by trained research assistants and invited to participate based on informed consent. Administration of the questionnaire was completed by research assistants who read aloud the questionnaire to students in intact classes so that all students were able to follow along at the same pace. The APRI was administered in a battery with other instruments over two 45-minute sessions (one before and one after recess), with approximately a 10-minute break during the two sessions.

Instruments

This six-scale APRI instrument measures three types of behaviours used to bully others (Physical, Verbal, Social) and three ways of being targeted (Physical, Verbal, and Social). In total 18 items were used to measure bullying and 18 items used to measure being bullied. However, two words within the instrument were modified to accommodate for primary school aged students. These were 'remark' modified to 'comment', and 'ridiculed' modified to 'embarrassed' (refer to Table 1 for items used). All items were measured on a six-point Likert response scale (1 = Never, 2 = Sometimes, 3 = Once or twice a month, 4 = Once a week, 5 = Several times a week, 6 = Every day). Responses closer to 1 represented small amounts of bullying or being bullied, whereas scores closer to 6 represented frequent amounts of bullying or being bullied.

Table 1.

Items used within the Adolescent Peer Relations Instrument (Parada, 2000)

Scale	Item
Bully Physical	
1	Pushed or shoved a student
2	Hit or kicked a student hard
3	Crashed into a student on purpose as they walked by
4	Got into a physical fight with a student because I didn't like them
5	Threw something at a student to hit them
6	Threatened to physically hurt or harm a student
Bully Verbal	
1	Teased them by saying things to them
2	Made rude comments at a student
3	Made jokes about a student
4	Said things about their looks they didn't like
5	Made fun of a student by calling them names
6	Called them names they didn't like
Bully Social	
1	Got my friends to turn against a student
2	Ignored a student when I was with my friends
3	Ignored a student by turning my back on them
4	Ignoring a student by pretending they were not there
5	Got other students to ignore a student
6	Left them out of activities or games on purpose
Target Physical	
1	I was pushed or shoved
2	I was hit or kicked hard
3	Students crashed into me on purpose as they walked by
4	My property was damaged on purpose
5	Something was thrown at a me to hit me
6	I was threatened to be physically hurt or harmed
Target Verbal	
1	I was teased by students saying things to me
2	A student made rude remarks at me
3	Jokes were made about me
4	Things were said about my looks I didn't like
5	I was embarrassed by students saying things to me
6	I was called names I didn't like
Target Social	
1	A student wouldn't be friends with me because other people didn't like me
2	A student ignored me when they were with their friends
3	A student got other students not to have anything to do with me
4	A student ignored me by turning his or her back on me
5	A student got their friends to turn against me
6	I wasn't invited to a student's place because other people didn't like me

Data Analysis Procedures

Evident in school bullying literature is the lack of scrutiny of instruments that measure bullying and victimisation. Marsh (e.g., Marsh, Martin, & Hau, in press) recommends the use of psychometric analysis which assesses first- and higher order factor structures of new or modified instruments. Accordingly, this will be achieved here using CFA. Item parcelling (with two to three items per parcel) was conducted due to the small sample size and the non-normal trend of the data (Hau & Marsh, 2004), with each latent variable consisting of two to three indicator parcels.

Confirmatory factor analysis (CFA) of the APRI was conducted with LISREL 8.54 (Joreskog, & Sorbom, 1993) using maximum likelihood estimation (Byrne, 1998). EM was used to deal with missing data. Moreover, SPSS 10.0 (Hills, 2002) was used to conduct reliability measures for scale score factors confirmed for both instruments. For the CFA, a very restrictive a priori model was tested in which each variable for each instrument was constrained to load on only the one factor that it was intended to measure, while all other loadings were forced to be zero. The goodness of fit (Marsh, Balla & Hau, 1996; Marsh, Balla & MacDonald, 1988) was tested using the Tucker-Lewis index (TLI), the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA) and chi-square (χ^2). The TLI and CFI vary along a 0-to-1 continuum to explain the % of covariance that can be elucidated among the variables, showing acceptable fits when greater than .90, and excellent fits when greater than .95 (Bentler, 1990). The RMSEA should be less than .05 to indicate a close fit, and less than .08 to reflect a reasonable fit. Additionally, parameter estimates and correlations between variables complement goodness of fit indices to confirm strong independent factor structures.

Results and Discussion

CFA and Internal Consistency: First-Order Factor Structure

First-order CFA was conducted on responses to the APRI. CFA of the APRI responses revealed strong factor loadings ($p < .001$) of all items onto their respective factors, ranging from .56 to .83 (see Table 2 for factor loadings, factor correlations, and Cronbach's alpha reliability ratings). As expected, correlations among factors indicated that among the bullying scales (ranging from .78 to .88, $p < .001$) and among the victimization scales (ranging from .79 to .84, $p < .001$) were all high, suggesting the possibility of second order Bully and Target factors. Importantly, the significantly positive (but small) correlations between victimization and bullying behaviours (ranging from .24 to .39, $p < .001$) demonstrated that participating in bullying behaviours is also associated with being a target of bullying.

The model resulted in a good fit to the data: TLI = .98, CFI = .99 which suggests 98% of the covariance can be explained among the variables. Further indications of a good fit were found with low errors in approximation of the population (RMSEA = .043) and a χ^2 of 1542.46 ($df = 579$).

Reliabilities of each of the six first-order a priori factors were acceptable. The Bullying factors (Bullying Physical, Bullying Verbal, Bullying Social) had alpha coefficients ranging from .81 to .89 (median = .82), as did the Target factors (Target Physical, Target Verbal, Target Social) where alphas ranged from .85 to .90 (median = .89).

These parameter estimates and goodness of fit indexes together with the internal consistency reliabilities provide support for the first-order a priori 6-factor, 36-item APRI (Bullying Physical, Bullying Verbal, Bullying Social, Target Physical, Target Verbal, Target Social).

Table 2.
Factor Loadings, Factor Correlations and Cronbach's Alpha Reliabilities of the First- and Second Order APRI Instrument Measuring Bullying and Victimization

Variables	Bully			Target			α
	Physical	Verbal	Social	Physical	Verbal	Social	
Factor Loadings							
Items							
1	.66	.71	.56	.71	.78	.74	.82
2	.66	.80	.69	.65	.80	.75	.89
3	.65	.74	.71	.69	.76	.81	.81
4	.64	.70	.64	.67	.77	.76	.85
5	.63	.83	.61	.72	.71	.82	.90
6	.67	.80	.66	.76	.80	.68	.89
Factor Correlations							
B. Phys	1.00						
B. Verb	.88	1.00					
B. Soc	.79	.78	1.00				
V. Phys	.39	.35	.28	1.00			
V. Verb	.30	.33	.24	.83	1.00		
V. Soc	.24	.24	.28	.79	.84	1.00	
Second-order Factor Loadings							
Bullying	.94	.93	.84				.93
Target				.89	.84	.89	.94
Second-order Factor Correlations							
Bully	1.000						
Target	.36	1.000					

Note. α = Cronbachs alpha; B. Phys = Physical Bullying; B. Verb = Verbal Bullying; B. Soc = Social Bullying; V. Phys = Physical Target; V. Verb = Verbal Target; V. Soc = Social Target.

Second Order Hierarchy

The second order factor structure of the 36 items comprising the APRI (see Figure 1), posited two second order factors: a second order Bully factor (defined by the first-order Bullying Physical, Bullying Verbal, Bullying Social factors) and a second order Victim factor (defined by the first-order Target Physical, Target Verbal, Target Social factors).

As expected, the second order model resulted in a slightly smaller but still excellent fit to the data than the first-order model (TLI = .98, CFI = .99, RMSEA = .044) and with a well-defined factor structure. Parameter estimates (see Table 2) demonstrated that the first-order factors substantially loaded onto the two second order factors (Bullying: ranging from .84 to

.94, median = .93; Target: ranging from .89 to .94, median = .89; $p < .001$). The correlation between these second order Bullying and Target factors ($r = .36$; see Table 2) was consistent with results based on the first-order factor structure. These results support the a priori second order factor structure consistent with the design of the instrument. Internal consistencies for the second order two-factor Bullying and Target subscales were also acceptable (alpha coefficient of Bullying = .93, Target = .94).

Strong psychometric qualities were found for the APRI. The strong first-order a priori 6-factor structure of the APRI as well as the acceptable second order two-factor structure (Bullying, Target), illustrate the flexibility of this instrument which can be used for analysis of (a) different types of bullying and being targeted (Bullying Physical, Bullying Verbal, etc.); as well as (b) overall bullying and experiences of being targeted (i.e., Bullying, Target). Importantly, this investigation is one of a few assessing the psychometric structure of a measure of bullying for pre-adolescent children. This is a potentially important contribution to bullying theory, research, and practice.

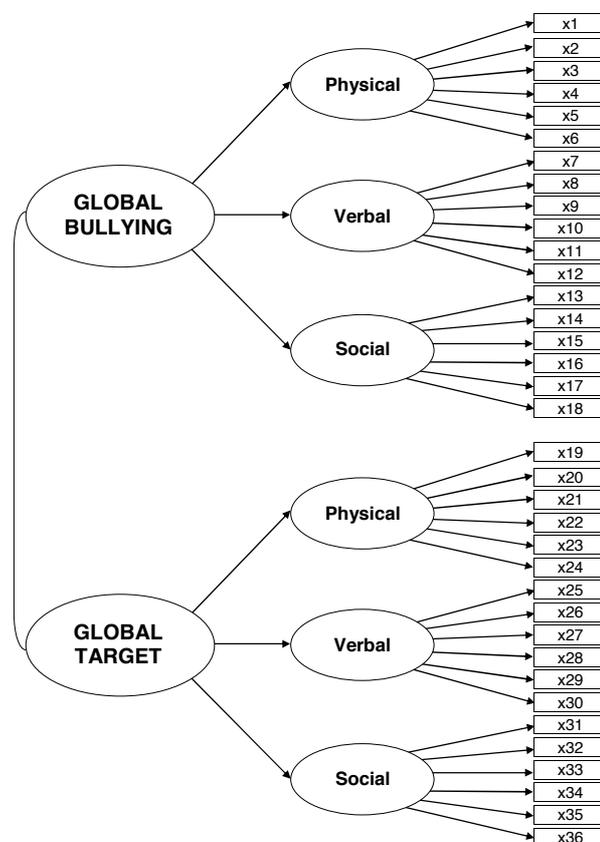


Figure 1. Second order hierarchical model of APRI to measure the three types of bullying and being bullied as well as global bullying and global target constructs

Summary and Implications

This research has drawn on advanced analytical techniques to conduct confirmatory factor analysis. This investigation would be further enhanced with tests for psychometric invariance across critical groups for both the first- and second order factor structures. Overall, this study did find strong support for the use of the APRI to be used with Year 5 and 6 primary age students as both a measure of the types of bullying as well as a measure of total bullying and experiences of being bullied.

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