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Development of the Multidimensional Peer Victimization Scale - Revised (MPVS-R) and the Multidimensional Peer Bullying Scale (MPVS-RB)

Abstract

Peer victimization is a frequent occurrence for many adolescents; however, some of the psychometric properties of self-report scales assessing these experiences remain unclear. Furthermore, with an increase in access to technology, electronic aggression should also be considered. The study examined the psychometric properties of the Multidimensional Peer Victimization Scale (MPVS, Mynard & Joseph, 2000), and developed versions to include the assessment of electronic aggression according to whether the adolescent was the target or perpetrator of peer victimization. Three hundred and 71 (191 girls and 180 boys M_{age} = 13 years 4 months, SD_{age}= 1 year 2 months) adolescents in the UK completed the MPVS including 5 newly developed items assessing electronic aggression, a version of the MPVS designed to assess victimization perpetration, and a measure of self-esteem. Confirmatory factor analyses yielded a five-factor structure comprising: Physical, social manipulation, verbal, attacks on property, and electronic for both scales. Convergent validity was established through negative associations between the victimization scales and self-esteem. Sex differences also emerged. One revised scale and one new scale are subsequently proposed: The Multidimensional Peer Victimization Scale - Revised (MPVS-R) and the Multidimensional Peer Bullying Scale (MPVS-RB).

Key words: peer victimization, peer bullying, self-esteem, electronic aggression

Development of the Multidimensional Peer Victimization Scale - Revised (MPVS-R) and the Multidimensional Peer Bullying Scale (MPVS-RB)

Since the work of Olweus in the 1970s, examining experiences of victimization has been the focus of numerous studies because of concern among researchers and practitioners regarding the consequences of these (e.g., Olweus, 2013; Renda, Vassallo, & Edwards, 2011; van Dam et al., 2012). Victimization can take many forms; however, research has primarily focused on verbal, physical, attacks on social relationships, and indirect attacks on the individual (Berger, 2007). Even though numerous measures have been developed to assess victimization from the perspective of the target and the perpetrator, many are often used beyond their original scope thus limiting the scales' psychometric properties (Felix, Sharkey, Green, Furlong, & Tanigawa, 2011). The current investigation examined the psychometric properties of one such scale: The Multidimensional Peer Victimization scale with 11- to 15-year-olds (MPVS, Mynard & Joseph, 2000).

Whilst some studies have used observational methods (e.g., Ostrov, 2008), others have used parents' and teachers' reports to examine victimization (e.g., Copeland et al., 2014; Fung, 2012) but both approaches have been criticised for relying on the respondents' potentially limited knowledge of when a victimization episode may have occurred (Buhs, McGinley, & Toland, 2010). Although peer-reports tend to be less frequently used, compared to other methods (e.g., Wei & Johnson-Reid, 2011), peer reports may overcome some of the concerns of children under- or over-reporting their experiences when completing self-reports (Menesini & Nocentini, 2009). Peer reports also overcome issues associated with children's willingness to self-disclose negative events and social desirability (Vlachou, Botsoglou, & Andreou, 2013). However, participation from a large proportion of the class or referent group is needed to ensure that the results are representative and accurate (Marks, Banbcock, Cillessen, & Crick, 2013) and, cut-off points for peer nominations have been

regarded as arbitrary (Vlachou et al., 2013). Peer reports are also susceptible to bias because victimization may occur without peer witnesses and peers may base their judgements on wrong or insufficient information (Gromann, Goossens, Olthof, Pronk, & Krabbendam, 2013). Researchers have tended to favour using self-reports to assess victimization (e.g., Mynard & Joseph, 2000) as they provide insight in to the individual's own experiences (Buhs et al., 2010). Further, parents and teachers tend to underestimate children's victimization experiences (Demaray, Malecki, Secord, & Lyell, 2013). Similar underestimation has also been identified with peer reports and this has been attributed to the relative visibility and subjectivity of the different victimization types (Grommann et al., 2013).

Despite the development of various self-report scales to assess victimization from the perspective of the target or perpetrator, aspects of the scales' psychometric properties remain unclear (see Table 1). The conceptualisation of victimization varies across the scales with some of the scales examining only limited behaviours and few scales exist to assess peer victimization. Assessing peer victimization is appropriate because adolescents most frequently experience victimization from their agemates in the school environment (Turner, Finkelhor, Hamby, Shattuck, & Ormrod, 2011). Compared to other peer victimization scales (e.g., Barchia & Bussey, 2010; Bilsky et al., 2013), Mynard and Joseph's (2000) MPVS provided a broader conceptualisation of peer victimization from the target's perspective. Further, the factor structure has been replicated using principal component analysis with a sample of 7- to 12-year-olds from Nigeria (Balogun & Olapegba, 2007). However, whether the factor structure of the MPVS can be replicated using confirmatory factor analysis is unclear. Additionally, Crothers and Levinson (2004) argued that the psychometric properties of the MPVS should be examined and that the attacks on property subscale warranted particular consideration as it received comparably little attention in the literature. Consequently, the current study examined the factor structure of the MPVS using

confirmatory factor analysis. Confirmatory factor analysis is an appropriate tool for the later stages of scale development when the underlying structure of the scale has previously been established and there is a clear theoretical rationale for the expected structure (Brown, 2006).

Relatively few of the existing scales simultaneously assess victimization experiences from the perspective of the target and the perpetrator. Nevertheless, research suggests that children who are a target of victimization are also often a perpetrator (Salmivalli, Lagerspetz, Bjorkqvist, Osterman, & Kaukiainen, 1996); therefore, researchers should examine both of these roles contemporarily. The scales that do assess both victimization experiences as a target and as a perpetrator often have a relatively limited conceptualisation of victimization. For example, some of the existing scales do not simultaneously assess verbal, social, physical, and electronic aggression but rather focus on specific aspects of victimization such as social (e.g., social bullying involvement scale; Fitzpatrick & Bussey, 2011) or physical, verbal, and social (e.g., adolescent peer relations instrument; Parada, 2000). However, as peer victimization can take many forms (Hawker & Boulton, 2000) that often vary according to the individual's unique experience, it is important to adopt a broad conceptualisation. Researchers who have assessed victimization separately from the perspective of the target and perpetrator have used the term peer victimization to denote experiences as a target of victimization and peer bullying to denote propensity to engage in victimization (e.g., Espelage & Holt, 2001; Fitzpatrick & Bussey, 2011; Parada, 2000). Consequently, the present study used the term peer victimization to denote adolescents' experiences as a target of peer victimization and peer bullying to denote adolescents' experiences as a perpetrator of peer victimization.

One common limitation applicable to all of the scales reviewed in Table 1 is the failure to assess electronic aggression. With the increasing digitisation of society, technology is being used more frequently as a medium to victimize (Dehue, Bolman, & Vollnick, 2008)

and, as such, research instruments are needed to examine electronic victimization. Whilst electronic victimization is a relatively new phenomenon, researchers and practitioners recognise the potential impact on children's psychosocial adjustment (Kowalski & Limber, 2013). Assessing electronic victimization via self-reports is appropriate because, compared to other forms of victimization that are often visible, other informants, such as parents and teachers, may be unaware of children's experiences in the digital world. Therefore, the present study will revise the MPVS to include a subscale examining electronic victimization: the MPVS-R and the MPVS-RB will include a comparable subscale assessing electronic bullying.

Insert Table 1 about here

Meta-analyses have indicated that self-esteem is a consistent correlate of victimization (e.g., Hawker & Boulton, 2000; Cook, Williams, Guerra, Kim, & Sadek, 2010) and, as such, was examined in the current study to provide evidence of the convergent validity of the victimization scales. Together the research suggests that children who are the target of victimization tend to have lower levels of self-esteem both concurrently and over time (e.g., Gendron, Williams, & Guerra, 2011; Schwartz, Lansford, Dodge, Pettit, & Bates, 2014). Similar relationships have emerged between cyber victimization and self-esteem (e.g., Cénat et al., 2014).

Sex differences have been reported in victimization. Boys report experiencing higher levels of physical victimization and more frequent attacks on properties than girls whereas girls report experiencing higher greater levels of social manipulation than boys (Mynard & Joseph, 2000). Similarly, more recent research has reported that boys more frequently experience direct or physical victimization and girls more frequently experience indirect or

relational victimization (Bevans, Bradshaw, & Waasdorp, 2013). Girls also report experiencing higher levels of electronic aggression when they participated in chat rooms and social network sites whereas boys experienced higher levels when they maintained an active social network profile and shared videos (Mesch, 2009). Further, boys also report engaging in more physical forms of bullying than girls whereas girls report engaging in more indirect forms of bullying (Kyriakides et al., 2006). Therefore, the sex differences were also examined in the current study.

The present study aimed to refine and develop two self-report instruments of children's peer victimization: One from the perspective of the target and one from the perspective of the perpetrator. The MPVS-R was refined to include a subscale to assess electronic victimization and the MPVS-RB was developed to assess peer bullying through the use of confirmatory factor analysis. The convergent validity of the MPVS-R and the MPVS-RB was examined through the relationship with self-esteem. It was hypothesised that a negative association would occur between victimization and self-esteem. Finally, sex differences in 11- to 15-year-olds victimization were also examined and it was hypothesised that boys would report experiencing more physical victimization and that girls would report experiencing more social and electronic victimization.

Method

Participants

Four hundred and 20 11- to 15-year-olds from two urban secondary schools were asked to participate in the study. One school was for 11- to 16-year-olds and the other school was for 11- to 18-year-olds. The schools were from the same East Midlands city in the UK and were comparable to the national average for eligibility for free school meals. Together, the schools served a range of socio-economic backgrounds and the majority of the sample was

white. Data was collected from 371 (191 girls and 180 boys M_{age} = 13 years 4 months, SD_{age} = 1 year 2 months) yielding an 88% response rate.

Measures

Peer victimization The 16-itemMultidimensional Peer-Victimization scale (Mynard & Joseph, 2000) was administered to the participants. Participants were asked to report "how often during the last school year has another pupil done these things to you?" for each of the items using a three-point scale: 1 (*Not at all*), 2 (*Once*), and 3 (*More than once*). Victimization was assessed across four different domains: Physical (e.g., "punched me"), social manipulation (e.g., "Tried to get me into trouble with my friends"), verbal (e.g., "Called me names"), and attacks on property (e.g., "Took something of mine without permission"). Following Kowalski, Limber, and Agatston's (2008) development of a cyber victimization experiences scale which asked about multiple aggressive experiences and multiple forms of media in the same question, five additional items were included to assess experiences of electronic aggression: (1) "Sent you a nasty text"; (2) "Said something mean about you on a social networking site (e.g., facebook, bebo, or myspace)"; (3) "Wrote spiteful things about you in a chat room"; (4) "Was nasty to you using instant messaging (e.g., MSN)"; and (5) "Sent you a hurtful email". Items were summed such that higher scores indicated greater peer victimization.

Peer bullying The 21 items administered to participants to assess peer victimization were rephrased to assess peer bullying across the five domains: Physical (e.g., "punched another person"), social manipulation (e.g., "Tried to get somebody in trouble with their friends"), verbal (e.g., "Called another person names"), attacks on property (e.g., "Took something of another person's without their permission"), and electronic (e.g., "Wrote spiteful things about somebody in a chat room). Participants were asked to report "how often during the last school year have you done these things to another pupil?" using a three-point

scale: 1 (*Not at all*), 2 (Once), and 3 (*More than once*). Items were summed such that higher scores indicated greater peer bullying.

Self-esteem The 7-item general self-worth subscale from Harter's (1982) Perceived Competence Scale assessed self-esteem (i.e., "I am sure of myself", "I am happy the way I am", "I feel good about the way I act", "I am sure I am doing the right thing", "I am sure I am doing the right thing", "I am a good person", "I want to stay the same", and "I do things fine"). Participants responded to the items using a 5-point scale ranging from 1 (*Strongly agree*) to 5 (*Strongly disagree*) and items were recoded and summed such that high scores denoted greater self-esteem. The scale had acceptable internal consistency ($\alpha = .77$).

Procedure

Participants worked through the questionnaire pack individually and at their own pace during a class session. All participants completed the questionnaires in the same order and were informed that there were no correct answers and that their individual responses would not be disclosed.

Consent for the research was initially given by the head teachers of the participating schools. Letters were then sent to parents informing them of the study and asking them to contact to the school if they did not want their son/daughter to participate. Before completing the questionnaires, participants gave their assent.

Results

Item analyses

Facility index and item-total correlations were performed on the electronic aggression items to examine the range of responses and the response patterns, respectively. The item analyses revealed that: "Sent you a hurtful email" and "Sent a hurtful email" failed to generate a range of responses and consequently not included in subsequent analyses.

Confirmatory Factor Analysis

Peer victimization Confirmatory factor analysis using Amos version 19 was performed to examine the factor structure of the MPVS-R. The proposed five factor model that reflected the four original subscales of the MPVS and the newly developed electronic subscale was compared to a two and four factor model (See Table 2). The two factor model comprised overt versus covert aggression and the four factor model comprised physical, social and electronic, verbal, and attacks on property. The five factor model met many of the requirements needed for good fit: The Root Mean Square Error of Approximation was an acceptable indication of fit and the Comparative Fit Index and the Goodness of Fit Index exceeded the acceptable value of .90 (Bryant & Yarnold, 1995). Although the chi-square was significant which may suggest some limitations in the fit of the data, such a result is common when sample sizes are greater than 200 (Schumacker & Lomax, 1996). The items exceeded or approached the minimum acceptable loading of .60 (Netemeyer, Bearden, & Sharma, 2003, see Table 3).

Insert Table 2 and Table 3 about here

Peer bullying A five factor model was proposed for the MPVS-RB to reflect the four original subscales of the MPVS and newly developed electronic aggression subscale. The proposed five factor model was compared to a two factor and four factor model. Again the two factor model comprised overt versus covert aggression and the four factor model comprised physical, social and electronic, verbal, and attacks on property. The five factor model met many of the model fit requirements (Table 2), a number of items were below the minimum acceptable loading of .60 (Table 4).

Insert Table 4 about here

Estimated reliability

The estimated reliability was calculated for the subscales for the full sample, boys, and girls for each of the subscales (see Table 5). For all of the subscales, the estimated reliability exceeded .80.

Insert Table 5 about here

Sex differences

To examine whether sex differences occurred in the factor loadings of the two scales, Byrne's (2010) procedure was used. All of the paths were constrained to be equal across groups and then individually unconstrained with chi-square change calculated for each path to identify potential sex differences (see Tables 3 and 4). Constraining all paths indicated that there were sex differences for the peer victimization, $\Delta\chi^2(30) = 259.15$, $p < .001$, and the peer bullying, $\Delta\chi^2(30) = 187.92$, $p < .001$, scales.

For the physical peer victimization scale, the item "Hurt me physically in some way" loaded more strongly for girls and the item "Beat me up" loaded more strongly for boys. Similarly, the item "Swore at me" loaded more strongly for boys than girls. Girls had stronger loadings on all of the electronic target subscale items with the exception "Wrote spiteful things about you in a chat room" which boys had stronger loadings for.

For the physical peer bullying scale, the items "Hurt someone physically in some way" and "Beat another person up" loaded more strongly for girls than for boys. Girls also had stronger item loadings for "Made other people not talk to another person" from the social

subscale, “Made fun of another person because of their appearance” from the verbal subscale, “Stole something from another person” from the attack on property subscale, and “Wrote spiteful things about somebody in a chat room” from the electronic subscale than boys. Boys had stronger item loadings for “Deliberately damaged some property that belonged to me” from the attack on property subscale and “Wrote nasty things to somebody using instant messenger” from the electronic subscale. Together, these results indicate that there are some significant differences between the strength of the endorsement for items from the two scales.

Convergent validity was examined through the associations between self-esteem, the MPVS-R subscales, and the MPVS-RB subscales using partial correlations, controlling for age and conducted separately according to sex (Table 6). Small negative associations occurred between all of the MPVS-R subscales, MPVS-RB subscales (except physical), and self-esteem for boys such that the greater peer victimization, the lower the self-esteem scores and the greater the peer bullying, the lower the self-esteem scores. For girls, small negative associations occurred between the peer victimization subscales and self-esteem, such that those who experienced higher levels of peer victimization reported lower self-esteem. Engaging in social bullying was also negatively associated with self-esteem for girls with those who reported engaging in more frequent social bullying also reported experiencing lower self-esteem. There were also small positive associations between all of the MPVS-R and MPVS-RB subscales for both boys and girls indicating that some children who are targets are also perpetrators of victimization.

Insert Table 6 about here

To further explore the sex differences in peer victimization and peer bullying and self-esteem t tests were used (Table 7). Girls reported experiencing greater levels of social and

electronic victimization than boys, whereas boys reported experiencing higher levels of physical victimization and greater attacks on property than girls. Girls reported a greater propensity to engage in electronic bullying than boys, whereas boys reported a greater propensity to engage in physical bullying and attacks on property than girls. There were no significant differences between the overall scale scores for peer victimization, peer bullying, and self-esteem.

Insert Table 7 about here

Discussion

The present study examined the psychometric properties of the MPVS and developed a revised version with a subscale assessing electronic victimization (MPVS-R) and a comparable version to assess bullying behaviours (MPVS-RB). Confirmatory factor analysis indicated that a five factor model was the most appropriate for both scales.

Convergent validity of the MPVS-R was established for boys and girls: The peer victimization, subscales were negatively associated with self-esteem, although the effect sizes for these relationships were small. Similar negative associations occurred in boys between peer bullying (except physical) and self-esteem, although comparable relationships did not occur in girls (except between social bullying and self-esteem). Therefore, consistent with previous findings (Hawker & Boulton, 2000) experiencing higher levels of peer victimization were associated with lower self-esteem. A possible explanation for the lack of association between engaging in physical victimization in boys and self-esteem is that social status may act as a buffer in the relationship between aggression and self-esteem (Diamantopoulou, Rydell, & Henricsson, 2008). Consequently, future research should consider the mediating role of social status in the association between physical victimization and self-esteem.

There were also associations between the various subscales of the MPVS-R and the MPVS-RB suggesting that adolescents who experienced one form of peer victimization also experienced other forms of peer victimization and those who engaged in one form of peer bullying engaged in other forms of peer bullying. These relationships add support to the growing evidence that adolescents often experience multiple forms of victimization and this, may in turn, result in fewer opportunities to avoid victimization and foster a sense of a lack of control (Hooven, Nurius, Logan-Greene, & Thompson 2012). The associations between the subscales of the MPVS-R and the MPVS-RB indicate that adolescents who experienced peer victimization also engaged in peer bullying providing further evidence that adolescents are often bully-victims (Perren, Gutzwiller-Helfenfinger, Malti, & Hymel, 2012).

Sex differences also emerged in victimization. There were significant differences in the strength of some of the item loadings for the scales suggesting that adolescents experiences of peer victimization and peer bullying varies according to sex. Girls reported experiencing higher levels of social and electronic peer victimization whereas boys reported experiencing higher levels of attacks on property and physical peer victimization. A potential explanation for these sex differences resides in the nature of adolescents' peer relationships. Girls tend to favour having smaller more intimate relationships with their peers, whereas boys tend to favour engaging in larger social networks that are characterised by higher levels of physical activities (Erwin, 1995; Martin et al., 2013). Further, girls tend to maintain their social networks and friendships through engaging in higher levels of self-disclosure and intimacy and perceive that their friendships to be more supportive than boys (Malecki & Demaray, 2003). Therefore, for girls, experiencing more indirect forms of peer victimization may influence their social relationships (Juvonen, Wang, & Espinoza, 2013). Conversely, displays of physical aggression and attacks on physical property may facilitate the maintenance of boys' social relationships. For example, Low, Polanin, and Espelage (2013)

argue that young adolescent boys are more likely to use physical aggression when networks are smaller to exert influence in response to peer interactions. In the current study, boys reported engaging more frequently in physical bullying and attacks on properties which may reflect boys' propensity to engage in more direct forms of aggression (Zimmer-Gembeck, Geiger, & Crick, 2005). Girls were more likely to engage in electronic bullying compared to boys and this could be explained by the nature of electronic aggression. Specifically, the relative anonymity afforded to individuals who engage in electronic bullying compared to face-to-face bullying (Beale & Jall, 2007) may make this form of peer bullying more attractive to girls, as the potential consequences of engaging in such behaviour are reduced.

The revised MPVS-R and the MPVS-RB could be used by both researchers and practitioners to identify rates of peer victimization and peer bullying. For example, Beale and Hall (2007) argue that schools should frequently survey their pupils to gain an understanding of the prevalence of victimization. These self-report scales overcome some of the limitations of measures of victimization that rely on others' reports such as misattribution of the situation and under-estimation of events (Demaray et al., 2013; Grommann et al., 2013) whilst also assessing a wider of range of victimization types than previous scales. If the scales were further developed and administered to larger samples then it could be possible to develop cut off points for extreme levels of victimization. Further, Patchni and Hinduja (2010) argue that the reliable identification of those who engage in peer bullying, and in particular electronic bullying, could facilitate schools in reducing such behaviours. Once these individuals have been identified they could participate in appropriate anti-bullying interventions. Similar to Huston and Cowie's (2007) intervention, targeted peer support could be developed to match the victimization experienced by the individual. Through targeting anti-bullying interventions according to children's experience, schools may also increase the effectiveness because those involved in the provision of such interventions may feel that a targeted

approach is of more benefit to the children and thus enhance the effectiveness of the intervention (Jennings & Greenberg, 2009).

Whilst many of the items achieved the minimum factor loading, some of the items from the peer victimization and peer bullying subscales failed to reach the minimum. One potential explanation is that these items may contain behaviours that the current sample did not regard as age appropriate or associate them with victimization. Consequently, these items warrant further consideration specifically with regard to how the target sample conceptualise victimization. Although the scales met many of the required psychometric properties, the present research did not examine the test-retest reliability of the scales to establish the stability of the measures, which should be considered in future research. However, with the changing social dynamics in the peer arena (Betts & Stiller, 2014; Kindermann 2007), test-retest reliability of the scale may be modest at best. Future research should also further explore the validity of the scales through assessing the divergent validity of the measures and examining the convergent validity with other peer victimization and peer bullying measures. The current study used a three-point response format to assess victimization following Mynard and Joseph's (2000) original study. Whilst some argue that three-point scales limit the validity and discriminatory power of scales (Preston & Colman, 2000), more recent research as reported that three-point response formats are as effective as other formats (Jones & Loe, 2013) and that goodness of fit indexes become worse as the number of response alternatives increases (Maydeu-Olivares, Kramp, Garćia-Forero, Gallardo-Pujol, & Coffman, 2009).

In summary, the present study successfully developed a version of the MPVS to include an electronic subscale (MPVS-R) and a version to assess peer bullying (MPVS-RB). The validity of both scales was established through the association with self-esteem and sex differences emerged. The psychometric properties and comparable brief nature of these

scales will be useful for researchers and practitioners interested in further understanding adolescents' experiences of victimization.

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Table 1

Summary of some of the existing self-report measures of victimization

Scale	Subscales	Psychometric properties
Aggression scale (Orpinas & Frankowski, 2001)	Verbal aggression (5 items); physical aggression (4 items); general aggression (2 items)	Construct validity established Good internal consistency Test retest reliability established
Adolescent Peer Relations Instrument (Parada, 2000)	Physical victimization (6 items); verbal victimization (6 items); social victimization (6 items); physical bullying (6 items); verbal bullying (6 items); social bullying (6 items)	Good internal consistency Factor structure replicated with younger sample (Finger, Yeung, Craven, Parada, & Newey, 2008)
Bullying-Behaviour Scale (Austin & Joseph, 1996)	Peer victimization (6 items); Bullying behaviour (6 items)	Convergent reliability established: some subscales associated with self-esteem and depressive symptoms
California Bully Victimization scale	Victimization experiences at school for	Test-rest reliability established: over two weeks

(Felix, Sharkey, Green, Furlong, & Tanigawa, 2011)	elementary school-age (6 items) and secondary school-age (7 items) children	Convergent validity established: Scale scores associated with measures of satisfaction
Child Social Behaviour Questionnaire (Warden, Cheyne, Christie, Fitzpatrick, & Ried, 2003)	Practical prosocial (4 items); Relational prosocial (4 items); Overt antisocial (4 items); Relational antisocial (4 items); Victim (4 items)	Acceptable internal consistency
Multidimensional Peer Victimization Scale (MPVS, Mynard & Joseph, 2000)	Physical victimization (4 items); social manipulation (4 items); verbal victimization (4 items); attacks on property (4 items)	Acceptable internal consistency Convergent validity established: based on bully/victim status
Peer victimization (Barchia & Bussey, 2010)	Physical victimization (1 item); Relational victimization (1 item); Verbal victimization (1 item)	Acceptable internal consistency
Peer victimization (Bilsky et al., 2013)	Physical victimization (3 items); Relational	Convergent validity established

	victimization (3 items)	Acceptable internal consistency
Revised Olweus Bully/Victim Questionnaire (Olweus, 1996)	40 items experiences of victimization and bullying behaviours across verbal, physical, and indirect domains, location of experience and reaction of others	High internal consistency Construct validity established
Self-reported bullying, fighting and victimization scale (Espelage & Holt, 2001)	Bullying (9 items); fighting (5 items); victimization (4 items)	Factor analysis revealed the subscales were distinct Construct validity established Convergent validity associated with aggression
Self-Report of Victimization and Exclusion Scale (Buhs et al., 2010)	Overt victimization (6 items); relational victimization (5 items); social exclusion (5 items)	Convergent validity established: overt and relational victimization predicted depressive symptoms Good internal consistency
Social Bullying Involvement Scale	Social victimization (8 items); social bullying	Good internal consistency

(Fitzpatrick & Bussey, 2011)	(8 items); witnessing social bullying (8 items); intervening in social bullying (8 items)	Convergent validity established: some subscales were associated with aspects of psychosocial adjustment
Social Experience Questionnaire (Crick & Gropeter, 1996)	Relational victimization (5 items); Overt victimization (3 items); Receipt of prosocial acts (5 items)	Factor analysis revealed that the relational and overt victimization subscales were distinct and reliable Convergent validity established: relational victimization predicted loneliness, depression, social anxiety, and social isolation and overt victimization predicted depression
The Gatehouse Bullying Scale (Bond, Wolfe, Tollit, Butler, & Patton, 2007)	Over victimization (2 items); covert victimization (2 items)	Construct validity established Test-retest reliability established

Table 2

Tests of model fit

Model	df	χ^2	$\Delta\chi^2$	RMSEA	CFI	NFI
			MPVS-R			
Two factor	169	1134.96***		.13	.65	.62
Four factor	164	476.28***	658.68***	.07	.89	.84
Five factor	160	304.08***	172.20***	.05	.95	.90
			MPVS-RB			
Two factor	169	1211.52***		.13	.61	.57
Four factor	164	616.74***	594.78***	.09	.82	.78
Five factor	160	426.27***	190.47***	.07	.90	.85

Note. RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index, and NFI = Normalised Fit Index. $\Delta\chi^2$ compares the change in model fit compared to the previous model.

***$p < .001$.

Table 3

Item loadings for peer victimization scale for the full sample, boys, and girls

Subscale	Factor loading			$\Delta\chi^2$
	Full sample	boys	girls	
Physical				
Punched me	.65***	.70***	.42***	14.57***
Kicked me	.81***	.81***	.84***	65.51***
Hurt me physically in some way	.75***	.84***	.53***	57.60***
Beat me up	.54***	.59***	.10	167.46***
Social				
Tried to get me into trouble with my friends	.64***	.61***	.71***	1.82
Tried to turn my friends against me	.78***	.78***	.78***	4.72
Refused to talk to me	.66***	.69***	.61***	3.05
Made other people not talk to me	.81***	.80***	.79***	.13
Verbal				
Called me names	.71***	.75***	.66***	.12
Made fun of me because of my appearance	.73***	.75***	.70***	1.46
Made fun of me for some reason	.79***	.83***	.77***	4.57
Swore at me	.52***	.60***	.48***	14.50***
Attack on property				
Took something of mine without permission	.57***	.57***	.56***	2.69
Tried to break something of mine	.76***	.75***	.80***	2.98
Stole something from me	.75***	.79***	.64***	4.09
Deliberately damaged some property of mine	.80***	.84***	.72***	.57
Electronic				
Sent you a nasty text	.66***	.57***	.69***	13.32**
Said something mean about you on a social networking site	.79***	.70***	.83***	13.47**
Wrote spiteful things about you in a chat room	.67***	.77***	.61***	12.60**
Wrote nasty things to you using instant messenger	.78***	.76***	.79***	7.97*

*$p < .05$, **$p < .01$, ***$p < .001$

Table 4

Item loadings for the peer bullying scale for the full sample, boys, and girls

Subscale	Factor loading			$\Delta\chi^2$
	Full	boys	girls	
Physical				
Punched another person	.69***	.67***	.68***	5.93
Kicked another person	.63***	.63***	.60***	.98
Hurt someone physically in some way	.82***	.79***	.84***	38.66***
Beat another person up	.60***	.58***	.63***	39.80***
Social				
Tried to get somebody into trouble with their friends	.60***	.52***	.66***	4.68
Tried to turn another person's friends against them	.70***	.57***	.81***	2.68
Refused to talk to another person	.35***	.36***	.31***	2.01
Made other people not talk to another person	.75***	.75***	.78***	11.86***
Verbal				
Called another person names	.74***	.69***	.76***	1.73
Made fun of another person because of their appearance	.59***	.59***	.61***	19.56***
Made fun of another person for some reason	.74***	.72***	.77***	4.25
Swore at somebody	.64***	.58***	.70***	3.07
Attack on property				
Took something of another person's without permission	.47***	.49***	.43***	.59
Tried to break something of that belonged to another person	.90***	.92***	.82***	.12
Stole something from another person	.57***	.50***	.73***	21.13***
Deliberately damaged some property that belonged to another person	.87***	.88***	.85***	12.55**
Electronic				
Sent somebody a nasty text	.76***	.80***	.73***	2.76
Said something mean about somebody on a social networking site	.81***	.84***	.80***	22.64***
Wrote spiteful things about somebody in a chat room	.65***	.61***	.65***	50.48***
Wrote nasty things to somebody using instant messenger	.75***	.79***	.71***	5.34

** $p < .01$, *** $p < .001$

Table 5

Estimated reliability for the subscales for the full sample, boys, and girls

	Full	Boys	Girls
Peer victimization			
Physical	.91	.91	.86
Social	.87	.87	.87
Verbal	.84	.87	.81
Property	.90	.90	.90
Electronic	.91	.92	.90
Peer bullying			
Physical	.93	.90	.95
Social	.88	.86	.89
Verbal	.85	.85	.87
Property	.96	.96	.97
Electronic	.95	.97	.92

Table 6

Associations among the peer victimization, peer bullying, and self-esteem controlling for age with girls above the diagonal and boys below.

	Peer victimization						Peer bullying				
	1	2	3	4	5	6	7	8	9	10	11
1. Self-esteem		-.13	-.18*	-.24***	-.17***	-.18*	.11	-.17*	-.11	-.05	-.01
Peer victimization											
2. Physical	-.18*		.25***	.45***	.30***	.20**	. 36***	.17*	.39***	.04	.23**
3. Social	-.33***	.49***		.39***	.22**	.53***	.26***	.51***	.37***	.30***	.31***
4. Verbal	-.28***	.60***	.54***		.36***	.34***	.14	.21**	.38***	.12	.22**
5. Property	-.25***	.57***	.56***	.50***		.26**	.06	.07	.19*	.15*	.10
6. Electronic	-.25***	.37***	.60***	.41***	.39***		.28***	.35***	.40***	.31***	.55***
Peer bullying											
7. Physical	-.15	.56***	.32***	.42***	.43***	.31***		.38***	.46***	.44***	.44***
8. Social	-.27***	.26***	.54***	.30***	.44***	.48***	.45***		.44**	.43***	.41***
9. Verbal	-.17*	.27***	.22**	.42***	.31***	.16*	.46***	.28***		.30***	.53**
10. Property	-.20**	.25***	.26***	.22**	.41***	.21**	.45***	.54***	.40***		.40***
11. Electronic	-.27***	.19*	.42***	.24**	.30***	.61***	.36***	.58***	.22**	.45***	

Note.df = 172 for girls and 167 for boys because of missing data

* $p < .05$, ** $p \leq .01$, *** $p \leq .001$

Table 7

Means and standard deviations of peer victimization, peer bullying, and self-esteem according to gender with the results of t tests examining gender differences

	Boys		Girls			
	M	SD	M	SD	t	*d*
Peer victimization						
Physical	5.96	2.27	4.70	1.24	6.53***	.71
Social	6.54	2.54	7.09	2.53	2.03*	.22
Verbal	8.38	2.75	8.42	2.44	.14	.02
Property	5.93	2.26	5.42	1.78	2.34*	.25
Electronic	4.99	1.78	6.02	2.42	4.61***	.50
Scale total	31.80	9.03	31.71	7.13	.93	.01
Peer bullying						
Physical	5.46	1.86	4.63	1.36	4.85***	.52
Social	5.08	1.41	5.30	1.49	1.43	.15
Verbal	7.35	2.36	6.96	2.42	1.54	.17
Property	4.57	1.27	4.33	.88	2.07*	.22
Electronic	4.48	1.31	5.23	1.98	4.23***	.46
Scale total	26.85	5.87	26.38	6.03	.74	.07
Self-esteem	25.65	4.72	25.45	4.39	.40	.04

Note. df = 355 because of missing data

* $p < .05$, *** $p \leq .001$