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Hierarchical factor structure of the Bullying Participant Behavior Questionnaire with a middle school sample

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ABSTRACT

The Bullying Participant Behavior Questionnaire is a 50 item self-report survey designed to measure engagement in five bullying roles: bully, victim, assistant to the bully, defender of the victim, and outsider. The goal of the current study was to examine the higher-order factor structure of the BPBQ in a large middle school sample of 784 primarily White sixth- through eighth-grade students from the Midwest region of the United States. Analyses suggested that the Victim, Defender, and Outsider items loaded on their theoretically consistent factors and the Bully and Assistant items all loaded on a single factor (Bully/Assistant). Some factor correlations were moderate and suggested the presence of higher-order factor(s). A second-order EFA showed there appear to be two higher-order factors. Factor 1 is a combination of the Bully/Assistant and Outsider dimensions while Factor 2 is a combination of Defender and Victim dimensions. Confirmatory factor analysis indicated that the best fitting model consisted of the two general factors. There was a Pro-bully factor consisting of the Bully, Assistant, and Outsider group factors and a Pro-victim factor consisting of the Victim and Defender factors. There is support for the use of the BPBQ, but additional refinement of the items is needed.

Bullying has been the focus of thousands of published research studies and is a significant social issue for many schools around the world. Since Olweus' seminal bullying research was published in the 1970s, researchers around the globe have studied bullying because of the detrimental effects it has on students. Swearer and Espelage (2004, 2011) proposed that bullying should be studied from the social-ecological perspective because bullying does not only negatively impact the bully and victim but can also impact other peers in the school that witness bullying and is indirectly involved. Studying bullying through the social-ecological lens enables researchers to examine the role of peers, parents, teachers, administrators, as well as influences from schools and communities. Though their work preceded the social-ecological framework proposed by Swearer and Espelage (2011) was one of the first studies to acknowledge these "other" peers that were neither the bully nor victim, but still played a significant role in the bullying process. Salmivalli et al. identified other roles in which peers can participate that impact bullying, which they labeled as assistant to the bully, reinforcer to the bully, defender of the victim, and outsider.

Sometimes these roles are collectively referred to as bystanders. Examining the influence of bystanders aligns with the social-ecological perspective (Swearer & Espelage, 2004, 2011). Salmivalli and her colleagues used a peer nomination procedure to assess engagement as a bully, victim, or one of the bystander roles.

The Bullying Participant Behavior Questionnaire (BPBQ) was developed by Summers and Demaray (2008) as a self-report measure of five bullying roles: bully (i.e., students who use aggression repeatedly and intentionally towards peers whom they have power over), victim (i.e., the recipient of peer aggression), assistant to the bully (i.e., individuals who reinforce or support the bully, such as holding down a student or encouraging the bully to continue), defender of the victim (sometimes called active bystanders because they stand up for the victim directly or indirectly by reporting bullying to a teacher or other adult, confronting the bully, or helping the victim after they have been bullied by offering emotional support), and outsider (also called passive bystanders, individuals who ignore or pretend not to notice when someone is being bullied (Salmivalli, Lagerspetz, Björkqvist, Österman, &

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Kaukiainen, 1996; Summers & Demaray, 2008)). Summers and Demaray did not include the "reinforcer" role identified by Salmivalli et al. due to the overlap in assisting and reinforcing behavior. Additionally, Salmivalli and Voeten (2004) later collapsed these two roles in a revision of the Participant Role Questionnaire (PRQ; Salmivalli et al., 1996). Demaray, Summers, Jenkins, and Becker (2014) published preliminary evidence of reliability and validity for the BPBQ, but less than optimal factor analytic techniques were used.

The BPBQ has been used in a number of empirical studies since its development, all of which were grounded in the social-ecological model since these studies were not only interested in internal characteristics of bullies and victims. For example, Jenkins, Tennant, and Demaray (2018) investigated the association between the five roles measured by the BPBQ and executive functioning. Jenkins, Demaray, and Tennant (2017) examined social, emotional, and cognitive predictors of the five different bullying roles, as measured by the BPBQ. Jenkins and Nickerson (2017) used the BPBQ to explore whether engagement in the different bullying roles was associated with steps leading to bystander intervention. Jenkins, Demaray, Fredrick, and Summers (2014) examined how different bullying roles were associated with social skills. Across these studies, the BPBQ has been used with school-age youth to measure experiences with all bullying participant roles from the students' perspective, without relying on peer, parent, or teacher reports. Though the BPBQ has been used in published research, there is only one published study regarding psychometric properties of the measure, Demaray et al. (2014), as described below.

Assessment of participant roles

A self-report survey, like the BPBQ, which produces reliable and valid scores of multiple bullying roles would be of great value to practitioners and researchers. There is great utility for practitioners to be able to use the BPBQ to assess entire schools and determine to what extent students engage in the five bullying roles. Assessing entire school populations across the dimensions of the BPBQ can readily lead to the development of targeted bullying prevention programming. For example, if practitioners find that very few students are defending their peers, schools can teach students strategies to encourage active bystander intervention.

Similarly, there is great utility for researchers to have a self-report rating scale of bullying role behavior. Though self-report has some limitations, such as untruthful responses or social desirability, there are some benefits to using self-report for bullying-related behavior. Previous research has found vast differences in frequency of bullying when comparing reports from teachers and students with teachers underreporting bullying incidences (Swearer, Siebecker, Johnsen-Frerichs, & Wang, 2010). Teachers are not always aware that bullying is occurring and do not always witness bullying, so they underestimate its frequency. Many bullying role behaviors assessed by the BPBQ happen covertly or when adults are not around; therefore, the self-report format allows students to report on bullying incidences that may not otherwise be witnessed.

There are several surveys used by researchers and practitioners that measure engagement in bullying and victimization, but few of them assess assisting, defending, or the outsider role. In 2011, the *Injury Prevention and Control: Violence Prevention Department of the Center for Disease Control and Prevention* published a compendium of assessment tools for bullying and victimization (Hamburger, Basile, & Vivolo, 2011). That compendium identified 33 scales that measure engagement in bullying roles (four for bullying, eight for victimization, and 13 for both bullying and victimization), but only eight of these scales mentioned bystanders (i.e., individuals who are involved in bullying but are not the bully or victim). One scale, the Participant Role Questionnaire (PRQ; Salmivalli et al., 1996), classified students into different bullying participant roles. The PRQ uses a peer nomination procedure and sociometric methods to sort children ages 7 to 10 years into one of the following categories: bully, assistant, reinforcer, victim, defender, or outsider. The peer nomination method used in the PRQ has some limitations, such as assignment to only one role, hesitation of U.S. schools to use peer nomination, and time to administer (Summers, 2008); therefore, the BPBQ was developed as a self-report measure of engagement in multiple bullying roles.

Benefits and development of the BPBQ

The central goal for developing the BPBQ was to create a self-report measure that accurately assessed behaviors associated with five participant roles (bully, victim, assistant, defender, and outsider). Very few bullying measurement tools assess all five of these bullying and bystander roles and most of them use a peer nomination process. The BPBQ is easy to use in the school setting, can be scored quickly (especially if administered electronically), and gives each student an opportunity to share their experiences at school. This self-report method is

commonly used in schools, unlike a peer nomination procedure which requires additional preparation time.

The BPBQ was originally developed and tested in a pilot study of middle school students (77 sixth graders, 59 seventh graders, and 67 eighth graders; Summers, 2008). There were 70 total items with 14 items per subscale. Using principal component analysis, a five-factor structure (Bully, Assistant, Victim, Defender, and Outsider) which accounted for 55% of the variance (Summers, 2008) was reported. After examining the results of the pilot study, the scale was refined and tested again using a sample of 250 junior high students (124 eighth graders and 126 seventh graders) from a large suburban area of the Midwest. Results revealed a four-factor structure (Bully, Victim, Defender, Outsider) because many items intended for the assistant factor loaded on the bully factor. The BPBQ was further developed and refined by adding additional Assistant items to help distinguish the Assistant from the Bully. Data were collected again with a sample of middle school students (N = 801; Demaray et al., 2014).

The final version of the BPBQ includes 50 items with 10 items for each subscale: Bully, Assistant, Victim, Defender, and Outsider (Demaray et al., 2014). When completing the scale, students are provided a definition of bullying and asked to rate how often in the last month they experienced or engaged in each behavior reflected by the item. The BPBQ uses a 5-point Likert scale with response options of never, 1 to 2 times, 3 to 4 times, 5 to 6 times, or 7 or more times; and scaled 0–4. In the Demaray et al. (2014) study, the total sample consisted of 801 sixth- through eighth-grade students (270 sixth-grade students, 264 seventh-grade students, and 266 eighth-grade students) from a suburban area in northern Illinois. The sample of 801 middle school students was randomly bifurcated to perform separate exploratory and confirmatory factor analyses.

A principal components analysis (PCA) using an oblique (Promax) rotation and forcing five-factors accounted for 60% of the variance. Several items were noted as cross-loading, but coefficients were less than .40 and may not be problematic. There was no specification of *a priori* criteria for determination of salient loading for inclusion or cross-loading, nor was there use of parallel analysis to assist in determining the optimal number of factors to extract.

A confirmatory factor analysis was conducted using the remaining half of the Demaray et al. (2014) sample to verify the five-factor structure. AMOS 20.0 maximum likelihood (ML) estimation was used and Demaray et al. reported support for a five-factor structure after addition of 20 error covariances (χ^2 (1,145) = 2,668.89, p < .001,

CFI = .88, SRMR = .06, RMSEA = .065, 90% CI [.062, .068], PNFI = .74). There was no indication which items included error covariances. Alpha coefficients ranged from .88 to .94, although these might be biased due to violations of assumptions regarding coefficient alpha (Gignac & Watkins, 2013; Raykov, 1997, 2001).

Although Demaray et al. (2014) provided some preliminary psychometric support for the BPBQ, there are several limitations with the analyses used or reported. First, PCA was used for final exploratory "factor" analyses but is at best considered only a data reduction technique and ought not be used to assess the latent factor structure or considered "factor analysis" (c.f., Fabrigar, Wegener, MacCallum, & Strahan, 1999; Gorsuch, 1983; Widaman, 1993). Because PCA analyzes all item variance, principal factors/axes analysis should be used to analyze only the common variance when assessing the latent factor structure. Further, given that some factor correlation coefficients exceeded .32, second-order EFA could be examined to determine hierarchical structure. Second, CFA reported by Demaray et al. was somewhat incomplete by not explicitly reporting if the model tested was oblique (like that of their EFA analyses) or orthogonal. If the model was an oblique model there was no specification of the factor covariances for comparison to the EFA promax based factor correlations. Also, without knowing if the CFA sample data were multivariately normal, the use of ML in AMOS may be problematic and robust ML estimation and Satorra–Bentler corrected χ^2 ought to be used. Further, if the model indicated oblique structure among the five BPBQ factors, examination of alternate higher-order and bifactor structures might be a suitable or perhaps better representation of data (Canivez, 2016; Reise, 2012). To address these issues, the primary goal of the current study was to further investigate the factor structure of the BPBQ with a large sample of middle school students using both exploratory factor analytic procedures as well as confirmatory factor analysis using more elaborative procedures.

Method

Participants

The present study included a total of 784 students from three midwestern middle schools. There were 380 boys, 400 girls, and gender was not reported by four students. There were 265 sixth graders, 254 seventh graders, and 259 eighth graders (6 students lacked grade information). School A included 342 students, School B included 326 students, and School C included 116 students. Before conducting analyses, the sample was

randomly bifurcated (see Data Analyses section) producing two data sets, with 392 participants each. These data sets included equal numbers of boys and girls within sixth, seventh, and eighth grade.

Measures

Bullying Participant Behavior Questionnaire (BPBQ; Summers & Demaray, 2008) is a 50 item self-report questionnaire that assesses engagement in five bullying roles: Bully ("I have pushed, punched, or slapped another student."), Assistant ("I have made fun of someone who was being called mean names."), Victim ("People have tried to make others dislike me."), Defender ("I defended someone by telling people that a rumor is not true."), and Outsider ("I ignored it when someone else threw something at another student."). Participants are presented with each item then asked to rate how often they have performed or experienced each in the past 30 days. Items are rated using a Likert scale ranging from 0 (Never) to 4 (7 or more times), with subscales score ranging from 0 to 40. Higher scores indicate more frequent participation in or experience of behaviors associated with that role.

Procedure

The first author assisted three different middle schools with school-wide social and emotional evaluations. Data collected during the evaluation were used to develop or enhance multi-tiered prevention programs to address bullying and the social-emotional needs of students. After students completed surveys, a comprehensive report was provided to the school and the first author provided consultative services. With approval of the school administrator, permission was granted by the Institutional Review Board to use the extant data for research purposes. Data from all schools were combined into one large dataset then was randomly bifurcated to create two smaller data sets for the analyses in the current study.

The data collection process was consistent across participating schools. At School A, a passive consent procedure was used where all parents were notified of the evaluation and were asked to notify the school office if they did not want their child to participate. Two parents asked that their child not complete the surveys. At School B and School C, parents signed consent for social, behavioral, emotional, and academic screening at the beginning of the school year, then were notified of the evaluation via a letter one week prior to the evaluation. One parent at School B and two parents at School C asked that their child not participate. At each school, student assent was obtained prior to the students completing surveys. As part of the assent, students were told that they could discontinue if they felt uncomfortable and that the school counselor/social worker was available to talk if they felt distraught after answering the questions.

Students used identification numbers on surveys and provided their grade and gender on their surveys. Only the school administrators, school social workers, and counselors at the respective schools had the ability to connect identification numbers to student names. After the data collection, all protocols were scored and a summary of each students' score (with their ID number) was given to the school counselor. Each school counselor followed up with students with scores that were elevated (per their own definition) on the victimization subscale. At School A, all surveys were administered on laptop computers in large groups during physical education classes. Students at School B completed pencil-and-paper surveys in large groups during their physical education class. Students at School C completed pencil-and-paper surveys in a classroom in groups of 20–25 students. At all schools, directions were read aloud before students began the surveys and teachers and/or research assistants were available to answer any questions. Items were read aloud to students who were receiving special education services for reading.

Data analyses

Exploratory factor analyses

Best practices in exploratory factor analyses (EFA) were guided by Watkins (2018). Due to the ordinal nature of BPBQ item ratings, polychoric correlations were estimated for the 50 BPBQ items using EQS 6.3 (Bentler & Wu, 2016) and the smoothed polychoric correlation matrix subsequently used for EFA. Item descriptive statistics and principal axis EFA (Fabrigar et al., 1999) used to analyze reliable common variance from the smoothed 50 BPBQ item polychoric correlation matrix were completed using SPSS 24.0 for Macintosh. As recommended by Gorsuch (1983), multiple criteria were examined for suggesting the number of factors to retain and included eigenvalues >1 (Guttman, 1954), the visual scree test (Cattell, 1966), standard error of scree (SE_{Scree}; Zoski & Jurs, 1996), Horn's parallel analysis (HPA; Horn, 1965), and minimum average partials (Velicer, 1976). The scree test is a subjective criterion to visually determine the optimum number of factors to retain and the SE_{Scree}, reported to be the most accurate objective scree method (Nasser, Benson, & Wisenbaker, 2002), was used as

programmed by Watkins (2007). HPA has been shown to be one of the most accurate *a priori* empirical criteria with scree sometimes a useful addition based on simulation studies (Velicer, Eaton, & Fava, 2000; Zwick & Velicer, 1986). HPA was included as typically it is more accurate, and therefore, reduces overfactoring (Frazier & Youngstrom, 2007; Thompson & Daniel, 1996). Assessment of HPA, however, indicates it tends to suggest fewer factors in the presence of a strong general factor (Crawford et al., 2010). HPA indicated potentially meaningful factors when eigenvalues from the BPBQ sample exceeded those produced by random data containing the same number of participants and factors (Lautenschlager, 1989). Random data and resulting eigenvalues for HPA using both mean and 95% CI were produced using the SPSS syntax from O'Connor (2000) with 100 replications to provide stable eigenvalue estimates. MAP was also conducted using SPSS syntax provided by O'Connor (2000). For EFA, the present study limited iterations in principal axis factor extraction to two in estimating final communality estimates (Gorsuch, 2003), balancing sampling error and measurement error in estimating communality. Gorsuch noted "Snook and Gorsuch (1989) found the resulting communalities to not differ significantly from the communalities designed into the study. This is a good procedure" (2003, p. 148). Promax rotation (k = 4 [to maximize hyperplane count]; Gorsuch, 1983) was used following extraction to examine correlated factors. Additionally, viable factors were required to contain a minimum of five items with salient item factor pattern coefficients (≥ .40), produce reasonable alpha coefficients (≥ .70), and include psychologically meaningful content. It was also preferable to achieve simple structure (i.e., no item cross-loadings; Thurstone, 1947). Higher-order EFA was conducted using promax rotated factor correlations.

Confirmatory factor analyses

Confirmatory factor analyses (CFA) were conducted using EQS 6.3 (Bentler & Wu, 2016). Mardia's standardized multivariate kurtosis estimate of 246.03 indicated multivariate non-normality, thus robust maximum likelihood estimation was used for analyses, including the Satorra and Bentler (2001) corrected chi-square. The Satorra–Bentler chi-square (S-B χ^2) is considered the most reliable test statistic for examining mean and covariance structures (Byrne, 2006). The current study evaluated model fit using the Tucker–Lewis index (TLI), comparative fit index (CFI), and the root-mean-square error of approximation (RMSEA). Generally, lower RMSEA values and higher TLI and CFI values

are desirable. Akaike's Information Criterion (AIC; Akaike, 1987) was also considered with the model with the smallest AIC value considered the best model and most likely to replicate (Kline, 2016). Adequate model fit required CFI ≥ .90 and RMSEA ≤ .08, and good model fit required CFI ≥ 0.95 with RMSEA ≤ 0.06 (Hu & Bentler, 1999). Differences between models were assessed using ΔCFI > .01 and ΔRMSEA > .015 (F. F. Chen, 2007; Cheung & Rensvold, 2002; Gignac, 2007) and ΔAIC > 10 (Burnham & Anderson, 2004).

Omega–hierarchical (ω_H) and omega–hierarchical subscale (ω_{HS}) coefficients (Reise, 2012) were estimated as model–based reliability estimates of the latent factors (Gignac & Watkins, 2013; Watkins, 2017). Alpha coefficients may be considered inadequate estimates of internal consistency for multidimensional scales with potential higher-ordered factors (Chen, Hayes, Carver, Laurenceau, & Zhang, 2012). McDonald's omega–hierarchical (ω_H) provides a more appropriate estimate because it is a model–based reliability estimate for the general factor in an ordered model and is independent of the variance of group factors. Omega–hierarchical subscale (ω_{HS}) is a reliability estimate of a factor with all other group *and* general factors removed (Reise, 2012; Rodriguez, Reise, & Haviland, 2016). The *Omega* program (Watkins, 2013) was used to estimate both Omega estimates (ω_H and ω_{HS}). These coefficients should exceed .50, but .75 is preferred (Reise, 2012; Reise, Bonifay, & Haviland, 2013); however, these criteria are guidelines and have not been empirically examined thoroughly.

Results

Descriptive statistics

The smoothed polychoric and Pearson product-moment correlations and descriptive statistics for the items from the EFA subsample can be found in the online supplement, Table A1. Polychoric correlations differed slightly from the Pearson correlations. Table A2 (see online supplement) presents item-level descriptive statistics for the EFA sample. Many items had non-normal distribution (Onwuegbuzie & Daniel, 2002; West, Finch, & Curran, 1995), with skewness estimates ranging from 0.68 to 8.07 (*Mdn* = 2.20). A total of 28 of the 50 items had skewness estimates greater than |2.0|. Univariate kurtosis estimates ranged from −0.65 to 72.88 (*Mdn* = 5.75). A total of 31 items had kurtosis estimates greater than |3.0|, 27 items had kurtosis estimates greater than |5.0|, but 16 were less than |2.0|. Mardia's (1970) normalized multivariate kurtosis estimate of 249.99 indicated BPBQ item data were multivariately non-normal (values > |5.00| indicative of

non-normality, Bentler, 2005). Because of this, principal axis factoring in EFA was used.

Exploratory factor analysis

The Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy of .777 was higher than the .60 minimum standard (Kaiser, 1974; Kline, 1994; Tabachnick & Fidell, 2007) and Bartlett's Test of Sphericity (Bartlett, 1954), $\chi^2 = 17,717.01$, $p < .0001$, indicated that the smoothed polychoric correlation matrix was not random. Initial communality estimates ranged from .533 to .927 ($Mdn = .777$). Factor analyses were considered appropriate given the present initial communality estimates and the sample size (Fabrigar et al., 1999; Floyd & Widaman, 1995; MacCallum, Widaman, Zhang, & Hong, 1999). The eigenvalue >1 criterion suggested six factors, while the SE_{Scree} criterion suggested up to 15 non-redundant factors. HPA and visual scree suggested four factors, which was one less factor that the BPBQ was designed to have. Figure A1 contains the HPA scree plot. Extraction of six or more factors produced factors containing too few items (<5) with salient factor coefficients, items without a salient factor coefficient, item cross-loadings, and alpha coefficients less than .70.

Extraction of five factors (see Table 1) indicates that it satisfied some *a priori* criteria and each BPBQ item achieved salient factor pattern coefficient. All items from the Assistant, Defender, Victim, and Outsider factors had salient pattern coefficients on their appropriate theoretical BPBQ factor (Demaray et al., 2014). However, Bully items were problematic in that only four items (1, 2, 9, and 10) had salient pattern coefficients on the fifth (presumably Bully) factor. Items 2, 9, and 10 had pattern coefficients (.371, .349, .295, respectively) that might be considered "aligned" with Factor 1 suggesting possible cross-loading. The remaining six items had salient factor pattern coefficients on the first factor (Assistant) and item 1 cross-loaded on Factor 1 *and* Factor 5. Alpha coefficients presented in Table 1 ranged from .84 to .93.

Extraction of four factors (see Table 2) satisfied all *a priori* criteria as all 50 BPBQ items had salient factor pattern coefficients on singular factors (simple structure/no cross-loadings) and produced acceptable internal consistency estimates. All items from the Defender, Victim, and Outsider factors had salient pattern coefficients on their appropriate theoretical factor (Demaray et al., 2014). The 10 Bully items and 10 Assistant items all had salient pattern coefficients on one single factor (Bully/Assistant). Alpha coefficients are presented in Table 2 and ranged from .89 to .95.

Some factor correlations presented in Tables 1 and 2 were moderate and suggested the presence of higher-order factors (Gorsuch, 1983; Thompson, 2004) requiring explication. Using the factor correlations produced by promax rotation (see Tables 1 and 2), second-order EFAs were performed with the five-factor and four-factor extractions. Table 3 presents results from second-order EFAs suggesting two higher-order factors. Factor 1 (labeled Pro-bully) is a combination of Outsider, Bully, and Assistant dimensions; while Factor 2 (labeled Pro-victim) is a combination of Defender and Victim dimensions. Factor 1 accounted for 35.20% (five-factor) and 39.84% (four-factor) of the variance. Factor 2 accounted for an additional 11.65% (five-factor) and 12.53% (four-factor) of the variance. These two higher-order factors (Pro-bully, Pro-victim) were moderately correlated in the five-factor ($r = .483$) and four-factor ($r = .493$) extractions.

Descriptive statistics (CFA)

Descriptive statistics for BPBQ items from the CFA sample are presented in Table A2 (see online supplement) and, like the EFA sample, many BPBQ items demonstrated non-normal distribution (Onwuegbuzie & Daniel, 2002; West et al., 1995) with univariate skewness estimates ranging from 0.84 to 7.28 ($Mdn = 2.41$), with 30 of the 50 items having greater skewness than $|2.0|$. Univariate kurtosis estimates ranged from -0.34 to 55.98 ($Mdn = 6.43$), with 31 items having kurtosis estimates greater than $|3.0|$, 30 items having kurtosis estimates greater than $|5.0|$, but 15 items had kurtosis estimates less than $|2.0|$. Mardia's (1970) normalized multivariate kurtosis estimate (EQS 6.3) of 246.03 indicated BPBQ item data were also multivariately non-normal (values > $|5.00|$ indicative of non-normality, Bentler, 2005). This, in addition to the use of polychoric correlations in analyses, required the use of the robust maximum likelihood estimation method with the Satorra and Bentler (2001) corrected chi-square as the most reliable test statistic in CFA (Byrne, 2006).

Confirmatory factor analyses

A total of 14 hypothesized models were examined as possible explanations of BPBQ item data in the middle school sample (7 using four BPBQ group factors [merged Bully/Assistant (B/A), Outsider (O), Victim (V), Defender (D)] and 7 using all five BPBQ group factors [Bully (B), Assistant (A), Outsider (O), Victim (V), Defender (D)]). Table 4 specifies tested models. Models 1 and 2 posited four

Table 1. Exploratory factor analysis results (Principal axis with promax rotation [k = 4]) of the Bullying Participant Behavior Questionnaire five-factor extraction with a middle school sample (N = 392).

BPBQ		F1: Assistant/Bully		F2: Defender		F3: Victim		F4: Outsider		F5: Bully		
Item	Subscale	P	S	P	S	P	S	P	S	P	S	h^2
i1	Bully	**.402**	.590	−.042	.056	.161	.447	−.058	.402	**.474**	.627	.581
i2	Bully	.371	.614	−.089	−.011	.096	.384	.110	.514	**.433**	.618	.590
i3	Bully	**.557**	.678	−.072	.049	.132	.418	.023	.461	.160	.384	.501
i4	Bully	**.592**	.656	−.131	.031	.192	.401	.027	.414	−.093	.162	.457
i5	Bully	**.618**	.714	.001	.126	.131	.461	−.022	.454	.146	.371	.545
i6	Bully	**.580**	.711	−.138	−.007	.128	.394	.104	.518	.065	.325	.539
i7	Bully	**.756**	.826	−.039	.124	.131	.461	.116	.560	−.190	.127	.720
i8	Bully	**.622**	.702	.028	.112	.033	.393	.013	.471	.162	.373	.519
i9	Bully	.349	.586	−.056	.025	.132	.425	.009	.451	**.549**	.701	.648
i10	Bully	.295	.497	−.024	.009	.037	.321	.023	.403	**.542**	.654	.522
i11	Assistant	**.766**	.730	−.010	.023	−.097	.301	−.100	.432	.233	.417	.584
i12	Assistant	**.964**	.846	.010	.105	−.034	.377	−.123	.445	−.081	.175	.735
i13	Assistant	**.847**	.796	.075	.126	−.103	.337	−.034	.484	.034	.262	.641
i14	Assistant	**.816**	.773	.093	.151	−.074	.359	−.057	.458	.054	.272	.607
i15	Assistant	**.726**	.791	−.109	−.011	.042	.392	−.001	.522	.183	.430	.669
i16	Assistant	**.444**	.612	.024	.098	.015	.318	.233	.530	.034	.259	.411
i17	Assistant	**.575**	.687	.081	.097	−.107	.315	.094	.531	.298	.482	.563
i18	Assistant	**.743**	.798	.099	.102	−.199	.288	.140	.609	.160	.388	.693
i19	Assistant	**.661**	.683	.138	.159	−.141	.277	.103	.495	.030	.233	.492
i20	Assistant	**.858**	.845	.003	.081	−.070	.345	.072	.563	−.078	.201	.727
i21	Victim	−.121	.338	.016	.372	**.833**	.821	.031	.241	.111	.307	.691
i22	Victim	−.153	.313	.019	.397	**.889**	.851	.011	.209	.088	.282	.744
i23	Victim	−.071	.374	.022	.373	**.793**	.800	.082	.282	.028	.246	.646
i24	Victim	−.128	.319	.030	.341	**.726**	.737	.086	.264	.123	.307	.565
i25	Victim	.162	.471	−.012	.328	**.715**	.765	−.029	.266	−.052	.183	.603
i26	Victim	.097	.444	−.009	.341	**.744**	.772	.025	.276	−.084	.157	.608
i27	Victim	−.088	.337	.069	.396	**.770**	.800	−.013	.222	.170	.342	.669
i28	Victim	.007	.383	.058	.399	**.777**	.817	−.065	.210	.110	.297	.680
i29	Victim	.141	.416	−.003	.372	**.802**	.798	−.100	.173	−.153	.074	.669
i30	Victim	.215	.451	.114	.401	**.576**	.689	−.021	.246	−.134	.079	.524
i31	Defender	−.140	.063	**.740**	.766	.092	.399	.071	.088	.081	.059	.606
i32	Defender	−.129	.019	**.721**	.755	.097	.359	.052	.029	−.053	−.077	.582
i33	Defender	.128	.198	**.743**	.788	.081	.448	−.091	.062	.000	.004	.641
i34	Defender	.187	.174	**.712**	.755	.049	.382	−.114	.011	−.158	−.150	.611
i35	Defender	−.043	.067	**.797**	.810	.056	.396	−.058	.010	.076	.028	.667
i36	Defender	−.117	.007	**.851**	.784	−.126	.246	.096	.066	.070	.001	.642
i37	Defender	−.031	.122	**.782**	.781	−.014	.348	.124	.140	−.035	−.035	.620
i38	Defender	.049	.140	**.819**	.834	.012	.389	.016	.081	−.069	−.075	.701
i39	Defender	.104	.158	**.807**	.839	.059	.435	−.103	.027	−.018	−.034	.717
i40	Defender	.079	.151	**.824**	.822	−.034	.361	.018	.090	−.066	−.074	.683
i41	Outsider	.245	.548	.059	.126	.004	.278	**.505**	.639	−.074	.177	.452
i42	Outsider	.040	.398	.082	.098	−.046	.198	**.535**	.590	.109	.290	.362
i43	Outsider	−.022	.474	−.045	−.004	−.014	.200	**.784**	.781	.052	.312	.615
i44	Outsider	−.026	.504	−.008	.126	.192	.373	**.737**	.751	−.074	.222	.595
i45	Outsider	.038	.499	−.080	−.007	.038	.228	**.745**	.759	−.047	.234	.583
i46	Outsider	.096	.526	−.048	.000	−.033	.196	**.753**	.778	−.063	.219	.616
i47	Outsider	−.024	.472	−.010	.042	.009	.228	**.773**	.768	.022	.283	.591
i48	Outsider	−.009	.478	.101	.117	−.064	.227	**.754**	.772	.102	.337	.609
i49	Outsider	−.038	.479	.089	.115	−.037	.245	**.776**	.787	.118	.359	.636
i50	Outsider	.237	.587	−.086	.000	.013	.230	**.671**	.746	−.211	.102	.621
Eigenvalue		17.0		7.85		3.37		2.39		1.47		
%S^2		33.36		15.00		6.03		4.05		2.17		
α		.93[1]		.95		.94		.89		.84[2]		
Factor Correlations		F1		F2		F3		F4				
F1: Assistant/Bully		–										
F2: Defender		.119		–								
F3: Victim		.482		.448		–						
F4: Outsider		.627		.066		.295		–				
F5: Bully		.319		−.037		.270		.343				

Note. G = general (factor identified by first unrotated dimension), P = factor pattern coefficient, S = factor structure coefficient (item correlation with factor), h^2 = communality estimate, α (coefficient alpha based on salient items on factor). Salient factor pattern coefficients (≥ .40) presented in bold. Italic denotes salient cross-loading on alternate factor. [1]Alpha coefficient included only salient Assistant items (10). [2]Alpha coefficient included only salient Bully items (4).

and five independent (orthogonal) factors, while Models 3 and 4 posited four and five correlated (oblique) factors, respectively. Models 5 and 6 were variants of Models 3 and 4, respectively; with two sets of correlated factors: B/A, O and B, A (Model 5); and B, A, O, and V and D (Model 6); but V and D were not correlated with B, A, or O as suggested by EFA results. Model 7 was a higher-order representation of Model 3 with one general factor and the four group factors, while

Table 2. Exploratory factor analysis results (Principal axis with promax rotation [k = 4]) of the Bullying Participant Behavior Questionnaire four-factor extraction with a middle school sample (N = 392).

BPBQ		F1: Bully/Assistant		F2: Defender		F3: Victim		F4: Outsider		
Item	Subscale	P	S	P	S	P	S	P	S	h^2
i1	Bully	**.509**	.643	−.146	.026	.292	.485	.007	.413	.468
i2	Bully	**.473**	.665	−.184	−.039	.215	.422	.163	.522	.498
i3	Bully	**.609**	.696	−.086	.040	.155	.429	.029	.461	.500
i4	Bully	**.591**	.641	−.069	.040	.123	.384	−.006	.405	.421
i5	Bully	**.669**	.728	−.008	.118	.147	.467	−.019	.452	.546
i6	Bully	**.616**	.719	−.124	−.011	.115	.396	.093	.515	.538
i7	Bully	**.732**	.794	.053	.140	.028	.432	.067	.546	.637
i8	Bully	**.674**	.717	.011	.103	.057	.401	.021	.470	.517
i9	Bully	**.471**	.648	−.181	−.011	.287	.471	.084	.463	.481
i10	Bully	**.411**	.557	−.154	−.026	.199	.368	.100	.415	.348
i11	Assistant	**.830**	.749	−.046	.011	−.050	.316	−.080	.432	.571
i12	Assistant	**.963**	.822	.072	.117	−.102	.356	−.154	.434	.697
i13	Assistant	**.875**	.790	.098	.128	−.129	.329	−.048	.476	.639
i14	Assistant	**.847**	.770	.110	.152	−.092	.351	−.067	.451	.607
i15	Assistant	**.787**	.810	−.126	−.021	.065	.403	.005	.521	.669
i16	Assistant	**.467**	.616	.036	.095	.003	.317	.225	.526	.411
i17	Assistant	**.647**	.717	.018	.077	−.028	.338	.128	.534	.524
i18	Assistant	**.795**	.811	.080	.094	−.175	.296	.149	.607	.691
i19	Assistant	**.682**	.680	.153	.160	−.158	.271	.095	.490	.492
i20	Assistant	**.860**	.826	.060	.091	−.134	.328	.041	.552	.694
i21	Victim	−.085	.362	.009	.357	**.857**	.830	.035	.243	.692
i22	Victim	−.122	.334	.019	.383	**.907**	.858	.011	.211	.746
i23	Victim	−.051	.387	.039	.364	**.788**	.800	.071	.282	.645
i24	Victim	−.091	.344	.016	.325	**.757**	.748	.094	.268	.565
i25	Victim	.171	.469	.037	.328	**.667**	.751	−.054	.261	.579
i26	Victim	.100	.440	.048	.342	**.686**	.754	−.006	.271	.576
i27	Victim	−.041	.366	.044	.377	**.815**	.813	.001	.226	.664
i28	Victim	.044	.403	.054	.385	**.798**	.823	−.063	.212	.682
i29	Victim	.129	.401	.078	.379	**.714**	.768	−.139	.166	.606
i30	Victim	.203	.435	.181	.407	**.505**	.663	−.055	.239	.484
i31	Defender	−.134	.066	**.704**	.754	.141	.396	.095	.089	.587
i32	Defender	−.152	.004	**.726**	.755	.099	.342	.055	.026	.583
i33	Defender	.122	.186	**.742**	.787	.091	.432	−.085	.058	.641
i34	Defender	.148	.140	**.756**	.765	.004	.349	−.132	.002	.600
i35	Defender	−.040	.064	**.763**	.800	.103	.389	−.035	.011	.648
i36	Defender	−.118	.005	**.808**	.773	−.072	.242	.123	.067	.615
i37	Defender	−.049	.108	**.782**	.780	−.008	.332	.131	.137	.620
i38	Defender	.025	.119	**.832**	.837	.005	.366	.016	.076	.702
i39	Defender	.091	.142	**.808**	.839	.066	.416	−.098	.023	.716
i40	Defender	.056	.130	**.835**	.825	−.041	.338	.018	.085	.684
i41	Outsider	.243	.543	.094	.128	−.037	.271	**.484**	.633	.440
i42	Outsider	.069	.419	.055	.085	−.013	.212	**.549**	.592	.356
i43	Outsider	−.002	.494	−.053	−.015	−.005	.214	**.788**	.783	.616
i44	Outsider	−.028	.509	.026	.124	.154	.370	**.717**	.748	.582
i45	Outsider	.041	.507	−.055	−.009	.009	.230	**.730**	.757	.576
i46	Outsider	.096	.530	−.020	−.001	−.068	.196	**.734**	.774	.606
i47	Outsider	−.010	.488	−.009	.034	.010	.237	**.773**	.769	.592
i48	Outsider	.020	.501	.075	.103	−.033	.243	**.768**	.774	.604
i49	Outsider	−.006	.505	.059	.099	.000	.263	**.791**	.790	.628
i50	Outsider	.216	.570	−.009	.012	−.079	.213	**.616**	.730	.556
Eigenvalue		17.06		7.85		3.37		2.39		
%S^2		33.30		14.97		5.99		4.02		
α		.94		.95		.94		.89		
Factor Correlations		F1		F2		F3				
F1: Bully/Assistant		–								
F2: Defender		.099		–						
F3: Victim		.494		.414		–				
F4: Outsider		.639		.052		.306				

Note. G = general (factor identified by first unrotated dimension), *P* = factor pattern coefficient, *S* = factor structure coefficient (item correlation with factor), h^2 = communality estimate, α (coefficient alpha based on salient items on factor). Salient factor pattern coefficients (≥ .40) presented in bold. Italic denotes salient cross-loading on alternate factor.

Model 8 was a variant of Model 4 with one general factor and the five group factors. Model 9 was a higher-order representation of Model 5 where there were two higher-order factors, one hierarchically ordered factor above B/A and O; and one hierarchically ordered factor above V and D. Model 10 was a higher-order representation of Model 6 where there were two higher-order factors, one hierarchically ordered factor above B, A, and O; and one hierarchically ordered factor above V and D. Model 11 was a bifactor representation of Model 7 and Model 12 was a bifactor

Table 3. Second-order exploratory factor analysis results (Principal axis with promax rotation [$k = 4$]) of the Bullying Participant Behavior Questionnaire with a middle school sample ($N = 392$).

	F1: Pro-bully		F2: Pro-victim		
	P	S	P	S	h^2
Five Factors[1]					
Bully/Assistant	**.761**	.795	.069	.437	.635
Defender	−.201	.128	**.683**	.586	.374
Victim	.225	.528	**.628**	.736	.581
Outsider	**.778**	.729	−.103	.273	.539
Bully	**.493**	.456	−.076	.162	.213
Eigenvalue	2.67		1.20		
%S^2	35.20		11.65		
	F1		F2		
F1: Pro-bully	−				
F2: Pro-victim	.483		−		
Four Factors[2]					
Bully/Assistant	**.813**	.829	.031	.432	.687
Defender	−.172	.140	**.633**	.548	.323
Victim	.227	.525	**.604**	.715	.551
Outsider	**.783**	.723	−.121	.265	.534
Eigenvalue	2.06		1.11		
%S^2	39.84		12.53		
	F1		F2		
F1: Pro-bully	−				
F2: Pro-victim	.493		−		

Note. [1]Higher-order factor solution based on five-factor EFA with promax ($k = 4$) rotation of first-order factor correlations from Table 1. [2]Higher-order factor solution based on four-factor EFA with promax ($k = 4$) rotation of first-order factor correlations from Table 2.

Table 4. Robust maximum likelihood CFA fit statistics for the Bullying Participant Behavior Questionnaire middle school sample ($n = 392$).

Measurement Models	S-B χ^2	df	p	TLI	CFI	RMSEA	RMSEA 90% CI	AIC
1 Four orthogonal factors (B/A, O, V, D)	1,639.10	1,175	.0001	.986	.987	.032	[.028, .035]	41,935.46
2 Five orthogonal factors (B, A, O, V, D)	1,701.85	1,175	.0001	.984	.985	.034	[.030, .037]	41,258.63
3 Four oblique factors (B/A, O, V, D)	1,538.60	1,169	.0001	.989	.990	.028	[.024, .032]	41,518.10
4 Five oblique factors (B, A, O, V, D)	1,459.36	1,165	.0001	.991	.992	.025	[.021, .029]	41,344.33
5 Two oblique (B/A, O)/Two oblique (V, D)	1,559.57	1,173	.0001	.989	.989	.029	[.025, .033]	41,630.05
6 Three oblique (B, A, O)/Two oblique (V, D)	1,498.80	1,171	.0390	.990	.991	.027	[.023, .031]	41,488.27
7 Four group factors, one higher-order	1,542.73	1,171	.0001	.989	.989	.028	[.024, .032]	41,581.68
8 Five group factors, one higher-order	1,482.62	1,170	.0001	.991	.991	.026	[.022, .030]	41,448.21
9 Four group factors, two higher-order	Model could not be estimated, matrix not positive definite[1]							
10 Five group factors, two higher-order	Model could not be estimated, matrix not positive definite[1]							
11 Four group factors, one general bifactor	1,331.44	1,125	.0001	.994	.994	.022	[.016, .026]	41,196.37
12 Five group factors, one general bifactor	1,299.17	1,125	.0002	.995	.995	.020	[.014, .025]	41,139.59
13a Four group factors, two general bifactor[2]	1,267.30	1,125	.0019	.996	.996	.018	[.012, .023]	41,054.07
13b No negative paths[3]	1,287.70	1,130	.0007	.995	.996	.019	[.013, .024]	41,074.32
14a Five group factors, two general bifactor[4]	**1,250.34**	**1,125**	**.0052**	**.996**	**.996**	**.017**	**[.010, .022]**	41,009.50
14b No negative paths $p < .05$[5]	**1,249.58**	**1,127**	**.0061**	**.996**	**.997**	**.017**	**[.010, .022]**	41,014.06
14c No negative paths $p < .05$ or paths $p > .05$[6]	**1,246.92**	**1,132**	**.0093**	**.996**	**.997**	**.016**	**[.009, .021]**	41,011.27

Note. S-B = Satorra-Bentler, TLI = Tucker–Lewis Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, AIC = Akaike's Information Criterion, B = Bully, A = Assistant, O = Outsider, V = Victim, D = Defender. [1]Model could not be estimated due to matrix not positive definite, even using EQS RETEST command to optimize start values. [2]Model 13a presented in Figure A2 in online supplement. [3]Model 13a respecified after removing negative paths and presented in Figure 1. [4]Model 14a presented in Figure A3 in online supplement. [5]Model 14a respecified after removing negative paths. [6]Model 14b respecified after removing nonsignificant ($p > .05$) paths and presented in Figure 2.

representation of Model 8. Finally, Model 13 was a bifactor representation of Model 9 and Model 14 was a bifactor representation of Model 10. Results from CFA are presented in Table 4 and fit statistics indicated that all models (except Models 9 and 10; which could not be estimated due to the matrix that was not positive definite) were well fitting models to these data. The ΔAIC > 10 (Burnham & Anderson, 2004) criterion identified meaningful model differences where TLI, CFI, and RMSEA typically did not.

Orthogonal, oblique, and higher-order models

With the exception of the orthogonal models (Models 1 and 2), models that included five group factors were better than models including four group factors (merged Bully and Assistant) and oblique (correlated) models were superior to orthogonal (uncorrelated) models. Oblique models indicated the possible hierarchical nature of BPBQ structure where higher-order or bifactor structures might be better. Higher-order Model 7 was equivalent to the oblique Model 3, while oblique Model 4 was better than higher-order Model 8. Neither of the higher-order models (four or five

first-order factors) that included *two* higher-order factors (Models 9 and 10) could be estimated in EQS 6.3 due to production of matrices that were not positive definite.

Bifactor models

Bifactor models are alternatives to higher-order models and Table 4 illustrates that bifactor models with one general factor (Models 11 and 12) were superior to their higher-order alternatives (Models 7 and 8). Because higher-order models containing two higher-order factors (Models 9 and 10) could not be estimated no comparisons could be made to alternative bifactor models. However, bifactor models containing two general factors (Models 13a and 13b [Figure A2 (see online supplement) and Figure 1] and Models 14a and 14c [Figure A3 (see online supplement) and Figure 2]) were superior to bifactor models containing only one general factor (Models 11 and 12). As with the oblique models, Model 14a and 14c (see Figure A3 [see online supplement] and Figure 2) that contained two general and five group factors was better than Model 13a and 13b (see Figure A2 [see online supplement] and Figure 1) that contained two general factors but four group factors (merged Bully and Assistant). Both Models 13 and 14 produced several statistically significant negative path coefficients between Bully/Assistant or Assistant group factors and item indicators. These negative paths were deleted and models re-estimated (see Table 4). For Model 13b, after removing paths with statistically significant negative coefficients (items 1, 2, 3, 9, 10) all remaining standardized path coefficients were statistically significant and retained and illustrated in
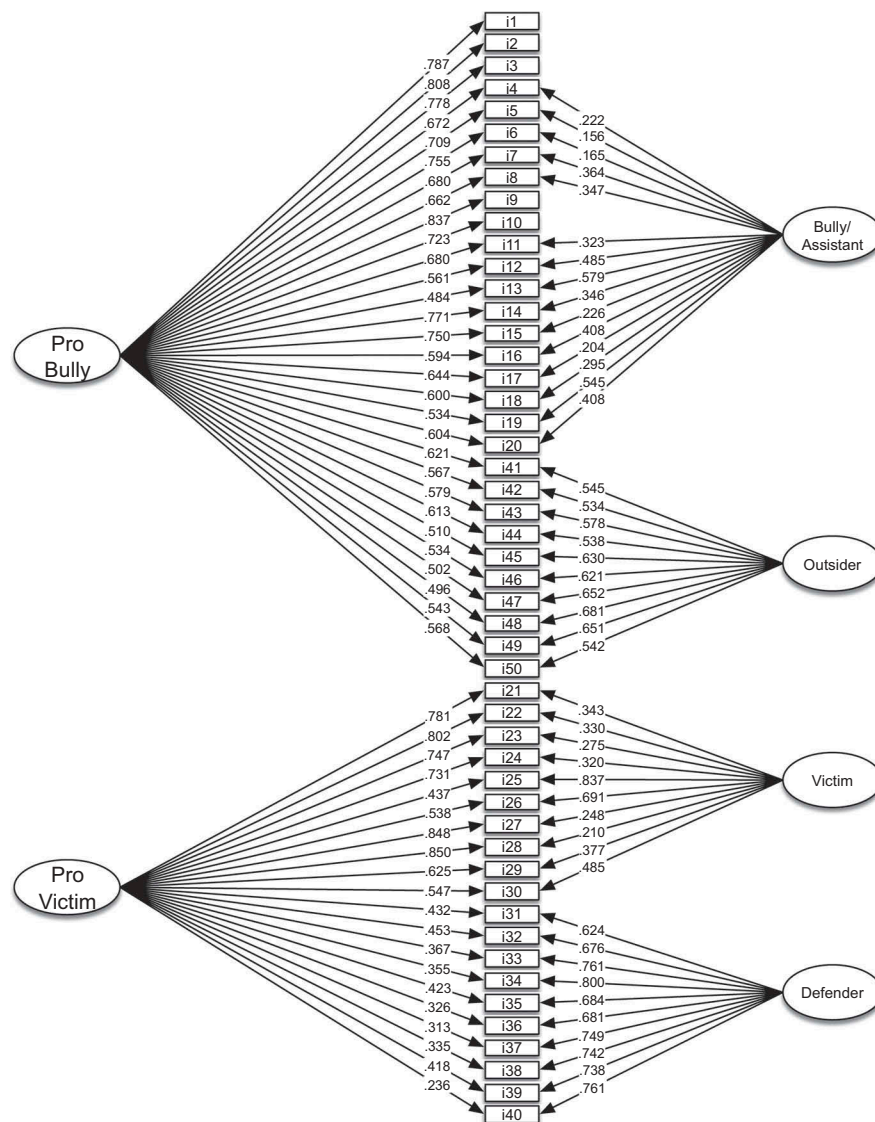
Figure 1. CFA bifactor measurement model with two general and four group factors (Model 13b) with standardized coefficients for the BPBQ middle school sample with negative path coefficients removed.
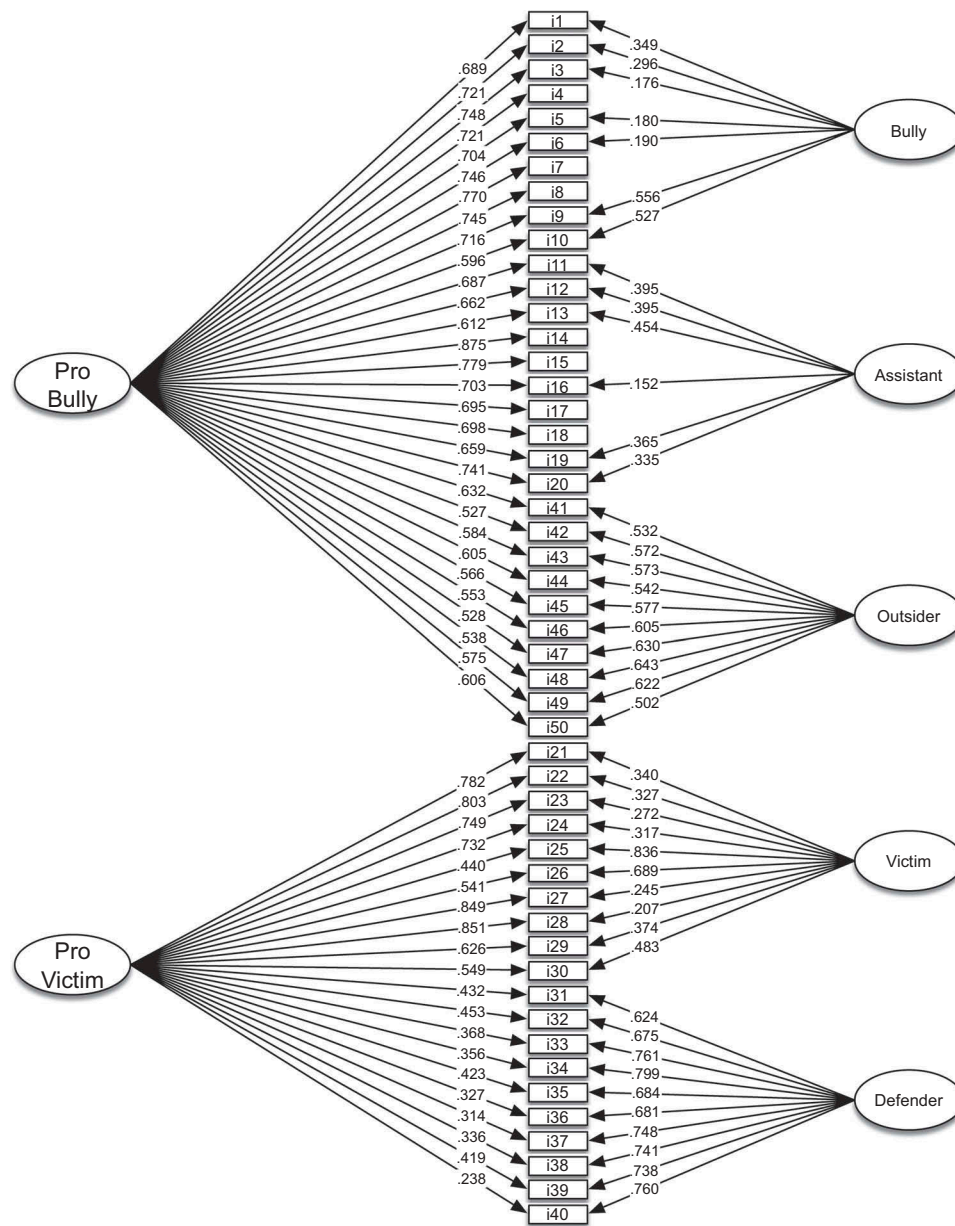
Figure 2. CFA bifactor measurement model with two general and five group factors (Model 14c) with standardized coefficients for the BPBQ middle school sample with negative and non-significant path coefficients removed.

Figure 1 and variance estimates presented in Table 5. For Model 14b, after removing the two statistically significant negative paths (items 17 and 18) and re-estimating the model, there were five nonsignificant ($p > .05$) paths. Model 14c (see Table 6 and Figure 2) presents the final standardized measurement model with statistically significant negative paths (items 17 and 18) and non-significant paths (items 4, 7, 8, 14, 15) removed.

Four group factors, two general factors

For comparison purposes and consistent with the EFA solution with simple structure, Model 13 (Four group factors, Two general factors) is further described in Table 5 and A3 (see online supplement), which present

decomposed item variance apportioned to the two general factors and the four group factors. As seen in both tables, items from the Bully/Assistant factor had larger portions of common variance associated with the general Pro-bully factor, while the Outsider items common variance was greater than or similar to the Outsider group factor and the general Pro-bully factor. Most Victim factor items had larger portions of common variance associated with the general Pro-victim factor and smaller portions of common variance associated with the Victim group factor. Defender items, however, had larger portions of common variance apportioned to the Defender group factor than the general Pro-victim factor. In the final model (see Table 6 and Figure 2) the

Table 5. Decomposed sources of variance for the bully participant behavior questionnaire middle school CFA sample (N = 392) according to a bifactor model (13b) with two general dimensions and four group factors (Reestimated with negative and nonsignificant path coefficients removed).

Item/Role		Pro-bully		Bully/Assistant		Outsider		Victim		Defender		h^2	u^2	ECV
		b	S^2	b	S^2	b	S^2	b	S^2	b	S^2			
i1	Bully	.787	.619									.619	.381	.999
i2	Bully	.808	.653									.653	.347	.999
i3	Bully	.778	.605									.605	.395	.999
i4	Bully	.672	.452	.222	.049							.501	.499	.902
i5	Bully	.709	.503	.156	.024							.527	.473	.954
i6	Bully	.755	.570	.165	.027							.597	.403	.954
i7	Bully	.680	.462	.364	.132							.595	.405	.777
i8	Bully	.662	.438	.347	.120							.559	.441	.784
i9	Bully	.837	.701									.701	.299	.999
i10	Bully	.723	.523									.523	.477	.999
i11	Assistant	.680	.462	.323	.104							.567	.433	.816
i12	Assistant	.561	.315	.485	.235							.550	.450	.572
i13	Assistant	.484	.234	.579	.335							.569	.431	.411
i14	Assistant	.771	.594	.346	.120							.714	.286	.832
i15	Assistant	.750	.562	.226	.051							.614	.386	.917
i16	Assistant	.594	.353	.408	.166							.519	.481	.679
i17	Assistant	.644	.415	.204	.042							.456	.544	.909
i18	Assistant	.600	.360	.295	.087							.447	.553	.805
i19	Assistant	.534	.285	.545	.297							.582	.418	.490
i20	Assistant	.604	.365	.571	.326							.691	.309	.528
i41	Outsider	.621	.386			.545	.297					.683	.317	.565
i42	Outsider	.567	.321			.534	.285					.607	.393	.530
i43	Outsider	.579	.335			.578	.334					.669	.331	.501
i44	Outsider	.613	.376			.538	.289					.665	.335	.565
i45	Outsider	.510	.260			.630	.397					.657	.343	.396
i46	Outsider	.534	.285			.621	.386					.671	.329	.425
i47	Outsider	.502	.252			.652	.425					.677	.323	.372
i48	Outsider	.496	.246			.681	.464					.710	.290	.347
i49	Outsider	.543	.295			.651	.424					.719	.281	.410
i50	Outsider	.568	.323			.542	.294					.616	.384	.523
Total Variance			.418		.071		.120					.609	.391	
ECV			.687		.116		.197							
ω			.973		.962		.952							
ω_H/ω_{HS}			.831		.124		.512							
i21	Victim	.781	.610					.343	.118			.728	.272	.838
i22	Victim	.802	.643					.330	.109			.752	.248	.855
i23	Victim	.747	.558					.275	.076			.634	.366	.881
i24	Victim	.731	.534					.320	.102			.637	.363	.839
i25	Victim	.437	.191					.837	.701			.892	.108	.214
i26	Victim	.538	.289					.691	.477			.767	.233	.377
i27	Victim	.848	.719					.248	.062			.781	.219	.921
i28	Victim	.850	.722					.210	.044			.767	.233	.942
i29	Victim	.625	.391					.377	.142			.533	.467	.733
i30	Victim	.547	.299					.485	.235			.534	.466	.560
i31	Defender	.432	.187							.624	.389	.576	.424	.324
i32	Defender	.453	.205							.676	.457	.662	.338	.310
i33	Defender	.367	.135							.761	.579	.714	.286	.189
i34	Defender	.355	.126							.800	.640	.766	.234	.165
i35	Defender	.423	.179							.684	.468	.647	.353	.277
i36	Defender	.326	.106							.681	.464	.570	.430	.186
i37	Defender	.313	.098							.749	.561	.659	.341	.149
i38	Defender	.335	.112							.742	.551	.663	.337	.169
i39	Defender	.418	.175							.738	.545	.719	.281	.243
i40	Defender	.236	.056							.761	.579	.635	.365	.088
Total Variance			.317						.103		.262	.682	.318	
ECV			.465						.152		.384			
ω			.966						.956		.951			
ω_H/ω_{HS}			.597						.251		.756			

Note. ECV = explained common variance, ω = omega, ω_H = omega-hierarchical, ω_{HS} = omega-hierarchical subscale.

general Pro-bully factor explained 68.7% of the common B/A and O item variance and yielded an ω_H coefficient of .831 indicating a unit-weighted composite score containing B/A and O items would account for 83.1% true score variance in the composite score. The ω_{HS} coefficient for the B/A group factor (.124) was not high enough to recommend separate interpretation, but the O group factor ω_{HS} coefficient (.512) met the recommended minimum standard for interpretation (Reise, 2012; Reise et al., 2013). The general Pro-victim factor explained 46.5% of the common V and D item variance and the ω_H coefficient of .597 indicated

Table 6. Decomposed sources of variance for the bully participant behavior questionnaire middle school CFA sample (N = 392) according to a bifactor model (14c) with two general dimensions and five group factors (Reestimated with negative and nonsignificant path coefficients removed).

Item/Role		Pro-bully b	Pro-bully S^2	Bully b	Bully S^2	Assistant b	Assistant S^2	Outsider b	Outsider S^2	Victim b	Victim S^2	Defender b	Defender S^2	h^2	u^2	ECV
i1	Bully	.689	.475	.349	.122									.597	.403	.796
i2	Bully	.721	.520	.296	.088									.607	.393	.856
i3	Bully	.748	.560	.176	.031									.590	.410	.948
i4	Bully	.721	.520											.520	.480	.999
i5	Bully	.704	.496	.180	.032									.528	.472	.939
i6	Bully	.746	.557	.190	.036									.593	.407	.939
i7	Bully	.770	.593											.593	.407	.999
i8	Bully	.745	.555											.555	.445	.999
i9	Bully	.716	.513	.556	.309									.822	.178	.624
i10	Bully	.596	.355	.527	.278									.633	.367	.561
i11	Assistant	.687	.472			.395	.156							.628	.372	.752
i12	Assistant	.662	.438			.395	.156							.594	.406	.737
i13	Assistant	.612	.375			.454	.206							.581	.419	.645
i14	Assistant	.875	.766											.766	.234	.999
i15	Assistant	.779	.607											.607	.393	.999
i16	Assistant	.703	.494			.152	.023							.517	.483	.955
i17	Assistant	.695	.483											.483	.517	.999
i18	Assistant	.698	.487											.487	.513	.999
i19	Assistant	.659	.434			.365	.133							.568	.432	.765
i20	Assistant	.741	.549			.335	.112							.661	.339	.830
i41	Outsider	.632	.399					.532	.283					.682	.318	.585
i42	Outsider	.527	.278					.572	.327					.605	.395	.459
i43	Outsider	.584	.341					.573	.328					.669	.331	.510
i44	Outsider	.605	.366					.542	.294					.660	.340	.555
i45	Outsider	.566	.320					.577	.333					.653	.347	.490
i46	Outsider	.553	.306					.605	.366					.672	.328	.455
i47	Outsider	.528	.279					.630	.397					.676	.324	.413
i48	Outsider	.538	.289					.643	.413					.703	.297	.412
i49	Outsider	.575	.331					.622	.387					.718	.282	.461
i50	Outsider	.606	.367					.502	.252					.619	.381	.593
Total Variance			.451		.030		.026		.113					.620	.380	
ECV			.728		.048		.042		.182							
ω			.975		.934		.930		.952							
ω_H/ω_HS			.880		.086		.074		.483							
i21	Victim	.782	.612							.340	.116			.727	.273	.841
i22	Victim	.803	.645							.327	.107			.752	.248	.858
i23	Victim	.749	.561							.272	.074			.635	.365	.883
i24	Victim	.732	.536							.317	.100			.636	.364	.842
i25	Victim	.440	.194							.836	.699			.892	.108	.217
i26	Victim	.541	.293							.689	.475			.767	.233	.381
i27	Victim	.849	.721							.245	.060			.781	.219	.923
i28	Victim	.851	.724							.207	.043			.767	.233	.944
i29	Victim	.626	.392							.374	.140			.532	.468	.737
i30	Victim	.549	.301							.483	.233			.535	.465	.564
i31	Defender	.432	.187									.624	.389	.576	.424	.324
i32	Defender	.453	.205									.675	.456	.661	.339	.311
i33	Defender	.368	.135									.761	.579	.715	.285	.190
i34	Defender	.356	.127									.799	.638	.765	.235	.166
i35	Defender	.423	.179									.684	.468	.647	.353	.277
i36	Defender	.327	.107									.681	.464	.571	.429	.187
i37	Defender	.314	.099									.748	.560	.658	.342	.150
i38	Defender	.336	.113									.741	.549	.662	.338	.171
i39	Defender	.419	.176									.738	.545	.720	.280	.244
i40	Defender	.238	.057									.760	.578	.634	.366	.089
Total Variance			.318								.102		.261	.682	.318	
ECV			.467								.150		.383			
ω			.966								.956		.951			
ω_H/ω_HS			.599								.247		.755			

Note. ECV = explained common variance, ω = omega, ω_H = omega-hierarchical, ω_HS = omega-hierarchical subscale.

a unit-weighted composite score containing V and D items would account for 59.7% true score variance in the composite score. However, while the ω_HS coefficient for the V group factor (.251) would be too low for interpretation, the ω_HS coefficient for the D group factor (.756) met the preferred standard for interpretation (Reise, 2012; Reise et al., 2013).

Five group factors, two general factors

The model with the lowest AIC value, thus the one most likely to replicate, was Model 14 (Five group factors, Two general factors). Model 14 is a bifactor model that included two general factors and five group factors (three group factors for Pro-bully and two group factors for Pro-victim) and most closely

related to the theoretical BPBQ model. Model 14 is described in Table 6 and A4 (see online supplement), which present decomposed item variance apportioned to the general factors and the five group factors. As seen in both tables, items from the Bully and Assistant factors generally had large portions of common variance associated with the general Pro-bully factor, while items from the Outsider group factor had common variance that was fairly evenly split between the general Pro-bully factor and the Outsider group factor. Common variance from the Victim factor items was generally larger for the general Pro-victim factor and smaller for the Victim group factor, while larger portions of common item variance from the Defender items was with the Defender group factor rather than the general Pro-victim factor. In the final model (see Table 6 and Figure 2) the general Pro-bully factor explained 72.8% of the common B, A, and O item variance and yielded an ω_H coefficient of .880 indicating a unit-weighted composite score containing B, A, and O items would account for 88.0% true score variance. The ω_{HS} coefficients for the B, A, and O group factors ranged from .074 to .483 and indicated composite scores from unit-weighted scores for these group factors did not contain sufficient portions of true score variance to warrant separate interpretation (Reise, 2012; Reise et al., 2013), although the O factor approached the minimum level of .50. The general Pro-victim factor explained 46.7% of the common V and D item variance and the ω_H coefficient of .599 indicated a unit-weighted composite score containing V and D items would account for 59.9% true score variance. While the ω_{HS} coefficient for the V group factor (.247) would be too low for interpretation, the ω_{HS} coefficient for the D group factor (.755) met the *preferred* standard for interpretation (Reise, 2012; Reise et al., 2013).

Discussion

The primary purpose of the present study was to examine the factor structure of the Bullying Participant Behavior Questionnaire (BPBQ) with a sample of middle school students in sixth, seventh, and eighth grades. The BPBQ was developed as a self-report measure of engagement in different bullying role behaviors, that is, bullying, assisting, defending, victimization, and outsider behavior. Studying bullying from a social-ecological perspective, rather than only studying the bully and victim, is a widely accepted approach taken by bullying researchers. Though the concept of multiple bullying roles was introduced over 20 years ago (i.e., Salmivalli et al., 1996), there are surprisingly few psychometrically sound measures of various bullying roles. The BPBQ was specifically designed as a tool to assess

multiple bullying role behaviors in a self-report format. Prior research has provided preliminary psychometric support for the BPBQ (Demaray et al., 2014), but the goal of the current study was to use updated analytic procedures to examine the factor structure of the BPBQ in a large middle school sample.

In general, analyses in the current study indicated that a five-factor model supports the basic theoretical aspects of the five bullying participant roles posited by the scale's authors (i.e., the five subscales of Bully, Assistant, Outsider, Victim, and Defender). Exploratory factor analysis indicated that though alpha coefficients were high for the five subscales (ranging from .84 to .95), the omega-hierarchical subscale coefficients (i.e., an estimate of internal consistency with the variance of the higher-order factors removed) were too low for interpretation for all subscales except the Defender subscale. Some caution should be used when using and interpreting scores from the other subscales.

Confirmatory factor analysis revealed good fit for the five-factor model with the presence of two general factors: Pro-bully and Pro-victim. The Pro-bully factor consisted of the bullying, assisting, and outsider roles. Conceptually, individuals engaging in these roles are promoting bullying in some regard through perpetration of aggression, encouraging aggressive behavior, or disregarding and ignoring bullying episodes. The pro-victim factor consisted of the victim and defender roles. Victims are certainly the target of bullying and directly affected, but defenders are also affected given their role in actively and prosocially engaging in bullying with a goal of helping the victim.

The presence of these two general factors may be due to a number of reasons. First, these bullying roles are not exclusive and engagement in one role or the other may depend on contextual characteristics. For example, an adolescent may be the victim of bullying in one setting but may step up to defend a peer in another setting. Similarly, a person can be both a victim *and* a bully. The BPBQ is designed to measure the degree of engagement in these five bullying roles, not to assign youth to a single role. It is possible to have high scores on two or more subscales. Though this improves the utility of the measure in some ways, it also makes factor analyses more difficult. A strength of this study is that hierarchical EFA and CFA was used, which exposed the two general Pro-bully and Pro-victim factors.

In practice, the BPBQ can be used in program evaluation and needs assessments. The BPBQ can be used to gauge the degree to which students in schools are engaged in different bullying roles, which can inform bullying

prevention and intervention efforts in school settings. For example, by using the BPBQ, schools can get a sense of relative frequency of all five bullying role behaviors. In addition to overall bullying and victimization, schools can determine if students are often ignoring bullying. If there is a large portion of students who ignore bullying, schools can create programming to discuss the negative impact of bullying on individuals and the overall school climate, in addition to different intervention options that students can use to intervene in bullying. Examining relative rates of bullying and victimization across grade, gender, and racial/ethnic groups, schools may be able to identify specific students that may be struggling or may benefit from targeted intervention efforts around bullying.

Limitations and future directions

The primarily White sample from rural schools in a Midwest state in the United States limits the ability to generalize the current findings to groups of students from racially/ethnicity diverse backgrounds and for international research. The social-ecological model of bullying has been applied in multi-cultural contexts and the self-report method of collecting data is also widely used across different demographic groups. Additional research is needed to examine the psychometric properties of the BPBQ across demographic groups and measurement invariance studies are needed. Analysis of the factor structure of the BPBQ should be replicated using large, representative samples.

The omega-hierarchical subscale coefficients indicated that all scales, other than the Defender scale, may not have strong enough unique true score variance to interpret scores derived from these scales. To strengthen the psychometric value of the BPBQ, there are several future directions for research. First, refinement of the wording of the items may improve the internal consistency of these scales. For example, the current subscales include a combination of verbal, relational, and physical bullying, with three or four items per type of bullying. The ability to measure engagement in each bullying role for each type of bullying may improve the overall reliability of the individual subscales; however, additional research is needed before these fine distinctions can be made. For example, not all victims are subjected to both verbal *and* physical bullying, so they would endorse different levels of experience with the items on the victim scale, therefore reducing the internal consistency of the scale. Since the goal of the current was to examine the factor structure of the existing measure using more sophisticated factor analytic methods, it was beyond the scope of the study to refine the wording of the items. However, future research can disaggregate these types of

bullying experience to improve the measure's reliability and factor structure.

Relatedly, some models showed that bully and assistant items merged onto a single factor, suggesting that these items may be measuring similar dimensions. Though individual episodes of bullying may have a separate bully and assistant, it is likely that over time the bully and assistant roles are fluid, with individuals stepping into and out of these roles. If this is the case, it is unlikely that a person is only a bully or only an assistant, so future studies could combine these two roles into one aggressor role.

In future adaptations of the BPBQ, the response options should be expanded to include a "no opportunity" or "has not happened to me" option. For example, when a student indicates they have "Never" "ignored it when someone else punched or poked another student," it is unclear as to whether they have not seen this happen so they have never ignored it or if they have never ignored someone being punched or poked. Greater clarity in the response options would improve interpretation of the scores.

Another area of future research involves investigating evidence for other types of validity to provide additional support for the BPBQ. Ratings derived from the BPBQ can be compared to ratings from the Participant Role Questionnaire (PRQ), which uses a peer nomination procedure. The BPBQ and PRQ have not been compared; thus, a critical type of validity evidence is missing.

Conclusion

In conclusion, these findings generally support a five-factor structure of the BPBQ with two general factors. Additional refinement of the scale, the need for a large nationally representative sample, as well as additional investigation of the reliability and validity of BPBQ scores is warranted. The BPBQ is a promising tool that can be used by both practitioners and researchers to measure a broad spectrum of bullying role behaviors using a self-report format. The finding that the bully, assistant, and outsider roles are related (i.e., the general factor we labeled "pro-bully"), and the victim and defender roles related (i.e., the general factor we labeled "pro-victim) are a unique contribution of the bullying literature. It is important to think about the idea that bullying roles may not be mutually exclusive. The presence of the general factors suggests that there are overarching similarities in these roles that should be further explored.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix (Online Supplemental Tables A1-A4, Figures A1-A3)

Table A1

Smoothed Polychoric Correlations (below diagonal), Pearson Correlations (above diagonal), and Descriptive Statistics for the Bully Participant Behavior Questionnaire Middle School EFA Sample (n = 392)

| | Bully Participant Behavior Questionnaire: **Bully Items** | | | | | | | | | |
	i1	i2	i3	i4	i5	i6	i7	i8	i9	i10
i1 Bully	–	.687	.461	.406	.449	.325	.323	.499	.642	.472
i2 Bully	.655	–	.528	.404	.445	.416	.389	.438	.590	.422
i3 Bully	.479	.527	–	.454	.460	.526	.540	.506	.456	.413
i4 Bully	.474	.442	.529	–	.390	.380	.426	.504	.356	.208
i5 Bully	.536	.525	.536	.419	–	.574	.535	.419	.457	.348
i6 Bully	.402	.482	.547	.417	.603	–	.727	.444	.428	.399
i7 Bully	.400	.467	.627	.521	.609	.642	–	.544	.335	.356
i8 Bully	.540	.515	.509	.597	.446	.417	.598	–	.472	.424
i9 Bully	.653	.608	.504	.405	.557	.508	.373	.551	–	.646
i10 Bully	.482	.463	.480	.176	.466	.478	.376	.427	.638	–
i11 Assistant	.514	.566	.502	.395	.504	.592	.570	.455	.454	.484
i12 Assistant	.424	.418	.587	.530	.623	.613	.662	.537	.426	.414
i13 Assistant	.413	.413	.505	.506	.514	.619	.643	.527	.503	.427
i14 Assistant	.503	.471	.464	.530	.519	.501	.588	.582	.444	.325
i15 Assistant	.579	.611	.622	.543	.563	.520	.627	.587	.513	.495
i16 Assistant	.320	.462	.397	.299	.426	.509	.537	.348	.396	.351
i17 Assistant	.557	.572	.491	.430	.469	.461	.481	.538	.530	.424
i18 Assistant	.483	.540	.436	.485	.560	.556	.618	.606	.459	.460
i19 Assistant	.329	.372	.360	.378	.520	.444	.568	.511	.407	.357
i20 Assistant	.406	.410	.598	.514	.636	.593	.683	.564	.448	.415
i21 Victim	.394	.320	.299	.293	.356	.258	.271	.315	.376	.263
i22 Victim	.360	.345	.321	.314	.297	.254	.285	.324	.338	.225
i23 Victim	.301	.291	.367	.219	.325	.351	.369	.295	.293	.291
i24 Victim	.299	.273	.295	.176	.333	.324	.311	.252	.337	.314
i25 Victim	.411	.368	.319	.463	.377	.236	.397	.356	.360	.245
i26 Victim	.360	.306	.329	.432	.381	.296	.397	.371	.338	.232
i27 Victim	.338	.280	.336	.259	.380	.363	.341	.323	.386	.354
i28 Victim	.370	.311	.338	.264	.430	.396	.341	.279	.402	.297
i29 Victim	.372	.230	.245	.341	.400	.343	.400	.262	.305	.196
i30 Victim	.349	.315	.382	.367	.368	.270	.500	.361	.230	.216
i31 Defender	.037	.006	.008	-.006	.098	.043	.073	.078	.087	.091
i32 Defender	-.018	-.055	.004	-.059	.042	-.027	.040	-.046	-.049	.016
i33 Defender	.150	.068	.131	.206	.130	.069	.180	.223	.098	.020
i34 Defender	.037	-.052	-.011	.139	.130	.070	.175	.183	.018	-.064
i35 Defender	.059	-.019	.027	.018	.075	-.021	.111	.095	.030	.034
i36 Defender	-.032	-.060	.000	-.063	.034	-.067	-.022	.048	-.033	.030
i37 Defender	.088	.026	.121	.078	.147	-.116	.109	.091	.029	-.020
i38 Defender	.065	.021	.061	.021	.196	.048	.158	.098	.032	-.032
i39 Defender	.084	.029	.143	.023	.163	-.015	.165	.151	.049	.008
i40 Defender	.063	.041	.063	.059	.113	.079	.164	.065	.023	.006
i41 Outsider	.325	.411	.402	.335	.447	.403	.529	.402	.333	.246
i42 Outsider	.314	.356	.318	.195	.317	.371	.365	.222	.326	.327
i43 Outsider	.330	.394	.338	.286	.338	.374	.405	.285	.374	.345
i44 Outsider	.316	.407	.417	.269	.386	.423	.481	.310	.351	.337
i45 Outsider	.299	.422	.377	.357	.362	.359	.477	.395	.348	.300
i46 Outsider	.248	.399	.353	.367	.380	.470	.428	.348	.369	.317
i47 Outsider	.314	.410	.315	.353	.333	.385	.411	.352	.349	.313
i48 Outsider	.338	.398	.362	.370	.320	.370	.400	.478	.358	.317
i49 Outsider	.413	.401	.367	.344	.327	.372	.383	.427	.341	.339
i50 Outsider	.311	.348	.366	.460	.391	.539	.550	.492	.360	.218
M	.727	.541	.259	.321	.196	.102	.066	.232	.515	.633
SD	.993	.839	.656	.776	.585	.435	.399	.659	.815	.909
Sk	1.718	2.102	3.358	3.233	4.172	6.347	8.068	3.804	2.071	1.839
K	2.887	5.292	13.144	11.452	20.769	49.479	72.882	16.534	5.126	3.629

Table A1 continued										
	Bully Participant Behavior Questionnaire: **Assistant Items**									
	i11	i12	i13	i14	i15	i16	i17	i18	i19	i20
i1 Bully	.441	.288	.305	.376	.436	.286	.511	.333	.249	.272
i2 Bully	.436	.285	.308	.361	.481	.381	.505	.356	.311	.291
i3 Bully	.421	.435	.456	.444	.573	.413	.426	.451	.329	.435
i4 Bully	.312	.344	.364	.416	.386	.281	.349	.386	.282	.340
i5 Bully	.415	.500	.430	.406	.455	.358	.361	.440	.427	.525
i6 Bully	.559	.607	.625	.491	.517	.541	.407	.570	.479	.637
i7 Bully	.489	.626	.631	.513	.545	.487	.395	.553	.557	.695
i8 Bully	.406	.409	.472	.485	.440	.292	.461	.557	.380	.440
i9 Bully	.409	.319	.392	.390	.369	.366	.466	.378	.311	.326
i10 Bully	.404	.278	.366	.298	.389	.350	.374	.378	.267	.277
i11 Assistant	–	.714	.625	.527	.556	.467	.492	.582	.547	.654
i12 Assistant	.703	–	.683	.594	.604	.535	.444	.602	.644	.857
i13 Assistant	.608	.658	–	.616	.581	.565	.535	.719	.615	.729
i14 Assistant	.537	.633	.606	–	.582	.476	.579	.700	.541	.634
i15 Assistant	.631	.629	.599	.657	–	.488	.482	.607	.517	.629
i16 Assistant	.423	.503	.518	.503	.491	–	.470	.528	.407	.544
i17 Assistant	.490	.527	.573	.620	.571	.498	–	.676	.426	.534
i18 Assistant	.634	.610	.692	.712	.656	.561	.727	–	.495	.681
i19 Assistant	.519	.593	.627	.534	.562	.395	.467	.541	–	.697
i20 Assistant	.645	.730	.672	.605	.659	.574	.555	.660	.681	–
i21 Victim	.233	.187	.276	.224	.337	.225	.243	.214	.230	.277
i22 Victim	.218	.238	.207	.203	.334	.215	.231	.155	.173	.194
i23 Victim	.279	.318	.255	.274	.344	.340	.263	.236	.211	.284
i24 Victim	.217	.269	.243	.252	.223	.220	.251	.243	.295	.243
i25 Victim	.257	.360	.330	.402	.365	.260	.357	.343	.279	.407
i26 Victim	.239	.293	.305	.346	.327	.308	.298	.292	.355	.336
i27 Victim	.259	.241	.254	.248	.215	.274	.287	.187	.231	.201
i28 Victim	.323	.322	.261	.284	.316	.288	.240	.283	.127	.242
i29 Victim	.208	.404	.316	.357	.290	.195	.200	.231	.180	.305
i30 Victim	.241	.370	.316	.341	.344	.226	.286	.258	.264	.287
i31 Defender	.029	-.003	.109	.064	-.015	.108	.061	.029	.123	.095
i32 Defender	-.033	.011	.043	.050	-.027	.042	-.049	.028	.061	.053
i33 Defender	.063	.175	.160	.240	.091	.139	.137	.167	.132	.045
i34 Defender	.078	.206	.135	.151	.019	.095	.061	.102	.123	.128
i35 Defender	-.031	.053	.065	.128	-.006	.055	.090	.082	.152	-.018
i36 Defender	-.014	.024	.085	.034	-.136	.041	.063	.079	.088	.009
i37 Defender	.025	.068	.096	.121	-.002	.063	.177	.076	.187	.123
i38 Defender	.067	.129	.081	.165	-.018	.090	.079	.073	.132	.116
i39 Defender	.038	.186	.133	.149	.069	.143	.062	.119	.149	.111
i40 Defender	.030	.112	.172	.184	.047	.090	.099	.084	.154	.099
i41 Outsider	.330	.416	.478	.357	.419	.419	.432	.428	.350	.503
i42 Outsider	.334	.311	.295	.295	.296	.330	.301	.364	.357	.360
i43 Outsider	.379	.318	.332	.400	.460	.409	.408	.485	.393	.441
i44 Outsider	.300	.416	.380	.356	.432	.491	.362	.458	.334	.432
i45 Outsider	.305	.339	.336	.401	.457	.424	.423	.450	.341	.428
i46 Outsider	.325	.406	.471	.323	.397	.425	.430	.531	.471	.461
i47 Outsider	.326	.323	.384	.291	.375	.403	.435	.468	.412	.451
i48 Outsider	.347	.341	.330	.375	.437	.335	.422	.505	.427	.397
i49 Outsider	.381	.327	.361	.389	.416	.362	.441	.507	.365	.414
i50 Outsider	.383	.454	.429	.431	.395	.437	.383	.483	.375	.493
M	.270	.097	.138	.148	.166	.237	.370	.130	.138	.074
SD	.654	.486	.522	.589	.607	.669	.769	.586	.546	.443
Sk	3.347	6.426	5.257	5.330	4.722	4.014	2.917	5.636	5.288	7.604
K	13.684	45.222	32.272	30.924	24.503	18.530	9.940	33.250	31.639	62.327

Table A1 continued										
	Bully Participant Behavior Questionnaire: **Victim Items**									
	i21	i22	i23	i24	i25	i26	i27	i28	i29	i30
i1 Bully	.370	.341	.297	.277	.387	.369	.313	.376	.361	.326
i2 Bully	.300	.304	.262	.236	.342	.326	.242	.302	.248	.268
i3 Bully	.238	.260	.262	.187	.241	.300	.256	.247	.182	.310
i4 Bully	.218	.250	.140	.153	.364	.366	.220	.202	.259	.275
i5 Bully	.237	.199	.184	.231	.225	.251	.234	.282	.221	.191
i6 Bully	.140	.126	.189	.192	.141	.183	.194	.226	.198	.191
i7 Bully	.150	.140	.162	.189	.198	.211	.171	.178	.201	.269
i8 Bully	.214	.225	.193	.194	.261	.284	.204	.201	.181	.264
i9 Bully	.340	.305	.253	.293	.323	.349	.337	.359	.294	.215
i10 Bully	.268	.213	.261	.307	.242	.308	.311	.272	.236	.245
i11 Assistant	.180	.171	.231	.190	.223	.211	.207	.235	.176	.175
i12 Assistant	.132	.141	.160	.154	.169	.157	.124	.150	.160	.158
i13 Assistant	.143	.131	.141	.153	.191	.204	.149	.173	.173	.206
i14 Assistant	.141	.154	.177	.157	.262	.238	.172	.191	.255	.225
i15 Assistant	.194	.195	.222	.141	.230	.214	.159	.218	.169	.221
i16 Assistant	.146	.163	.244	.179	.206	.244	.203	.204	.131	.194
i17 Assistant	.173	.164	.193	.185	.286	.256	.198	.165	.138	.188
i18 Assistant	.103	.097	.142	.139	.211	.210	.095	.160	.153	.167
i19 Assistant	.147	.108	.153	.193	.207	.211	.153	.088	.099	.138
i20 Assistant	.118	.098	.138	.110	.174	.153	.102	.127	.131	.128
i21 Victim	–	.834	.660	.674	.591	.657	.675	.628	.593	.489
i22 Victim	.765	–	.721	.657	.610	.655	.719	.714	.620	.511
i23 Victim	.653	.697	–	.712	.567	.567	.727	.736	.560	.510
i24 Victim	.653	.646	.677	–	.557	.587	.636	.621	.527	.439
i25 Victim	.620	.622	.560	.557	–	.841	.511	.566	.596	.525
i26 Victim	.646	.636	.553	.573	.776	–	.554	.555	.613	.547
i27 Victim	.667	.702	.707	.614	.527	.548	–	.787	.590	.513
i28 Victim	.638	.693	.717	.611	.574	.545	.741	–	.682	.549
i29 Victim	.628	.651	.582	.541	.617	.614	.608	.674	–	.599
i30 Victim	.513	.522	.539	.444	.582	.550	.527	.543	.603	–
i31 Defender	.340	.361	.367	.322	.235	.290	.392	.353	.326	.301
i32 Defender	.277	.334	.289	.264	.245	.259	.301	.333	.309	.339
i33 Defender	.383	.403	.341	.300	.353	.382	.332	.375	.376	.364
i34 Defender	.282	.316	.304	.283	.277	.261	.322	.375	.326	.376
i35 Defender	.354	.373	.311	.338	.245	.286	.384	.341	.333	.314
i36 Defender	.197	.234	.253	.253	.165	.172	.259	.214	.192	.222
i37 Defender	.293	.299	.285	.239	.343	.292	.268	.277	.287	.349
i38 Defender	.311	.332	.306	.235	.295	.326	.340	.356	.328	.356
i39 Defender	.379	.372	.355	.278	.307	.306	.369	.398	.368	.404
i40 Defender	.286	.307	.282	.262	.279	.291	.291	.307	.309	.341
i41 Outsider	.237	.199	.253	.179	.222	.193	.182	.227	.198	.294
i42 Outsider	.174	.125	.207	.229	.169	.165	.138	.130	.095	.201
i43 Outsider	.181	.152	.196	.165	.190	.174	.147	.137	.154	.125
i44 Outsider	.267	.278	.335	.279	.326	.350	.216	.265	.300	.348
i45 Outsider	.178	.143	.225	.160	.176	.185	.171	.139	.148	.298
i46 Outsider	.157	.130	.169	.175	.187	.199	.180	.130	.102	.156
i47 Outsider	.200	.177	.175	.267	.237	.256	.157	.142	.103	.156
i48 Outsider	.202	.194	.174	.236	.223	.205	.214	.185	.087	.156
i49 Outsider	.172	.159	.256	.243	.226	.225	.209	.230	.139	.170
i50 Outsider	.170	.135	.224	.103	.178	.216	.140	.176	.225	.169
M	1.395	1.257	.949	1.197	.640	.788	1.102	.926	.592	.599
SD	1.394	1.389	1.278	1.321	1.142	1.139	1.364	1.327	1.136	1.108
Sk	.784	.941	1.314	.999	1.979	1.654	1.078	1.370	2.101	1.986
K	-.651	-.406	.567	-.153	2.994	2.000	-.137	.586	3.386	3.004

Table A1 continued										
	Bully Participant Behavior Questionnaire: **Defender Items**									
	i31	i32	i33	i34	i35	i36	i37	i38	i39	i40
i1 Bully	.015	-.011	.113	.031	.057	-.015	.080	.052	.088	.042
i2 Bully	-.046	-.045	.016	-.068	-.014	-.090	-.010	-.021	.008	.002
i3 Bully	-.067	-.039	.034	-.072	-.032	-.058	.018	-.024	.076	-.033
i4 Bully	-.032	-.042	.149	.081	.019	-.029	.062	.006	.019	.027
i5 Bully	-.019	-.030	.009	.015	-.009	-.053	.030	.075	.003	.005
i6 Bully	-.065	-.073	-.028	-.039	-.070	-.112	-.106	-.039	-.067	-.017
i7 Bully	-.017	-.038	.011	.009	-.017	-.062	-.010	.008	.010	.020
i8 Bully	.012	-.058	.098	.096	.038	.016	.033	.023	.088	.017
i9 Bully	.011	-.061	.047	.011	.030	-.064	-.009	-.007	.023	-.021
i10 Bully	.056	.000	.016	-.048	.038	-.009	-.036	-.031	.003	.001
i11 Assistant	-.005	-.010	.026	.045	-.023	-.019	-.011	.027	.018	.020
i12 Assistant	-.028	-.007	.048	.066	-.003	-.012	.007	.017	.043	.012
i13 Assistant	.028	.002	.082	.055	.027	.005	.024	.021	.061	.077
i14 Assistant	.027	.037	.090	.049	.064	-.010	.041	.053	.072	.072
i15 Assistant	-.053	-.015	.028	-.040	-.015	-.096	-.047	-.040	-.009	-.006
i16 Assistant	.029	.004	.104	.034	.032	.000	.029	.028	.082	.052
i17 Assistant	.018	-.065	.070	.011	.039	.036	.128	.025	.024	.033
i18 Assistant	-.011	-.008	.075	.027	.028	.000	.024	.019	.061	.046
i19 Assistant	.019	.005	.022	.025	.040	-.013	.030	.023	.044	.022
i20 Assistant	.008	.002	-.016	.038	-.034	-.027	.005	.007	.009	.018
i21 Victim	.351	.288	.365	.295	.340	.215	.303	.316	.357	.286
i22 Victim	.351	.346	.377	.333	.366	.239	.309	.319	.366	.301
i23 Victim	.339	.280	.287	.289	.279	.229	.261	.274	.309	.243
i24 Victim	.310	.261	.278	.290	.319	.242	.260	.229	.278	.246
i25 Victim	.219	.224	.284	.221	.210	.148	.292	.240	.269	.239
i26 Victim	.261	.242	.326	.232	.249	.172	.273	.276	.279	.267
i27 Victim	.373	.317	.292	.332	.349	.251	.274	.320	.338	.272
i28 Victim	.338	.353	.327	.365	.314	.214	.270	.333	.360	.307
i29 Victim	.304	.304	.273	.278	.272	.209	.253	.289	.317	.296
i30 Victim	.279	.333	.317	.313	.293	.233	.300	.336	.362	.309
i31 Defender	–	.682	.622	.593	.670	.645	.608	.658	.641	.654
i32 Defender	.626	–	.629	.589	.695	.671	.561	.640	.659	.663
i33 Defender	.591	.577	–	.680	.748	.619	.626	.658	.695	.675
i34 Defender	.566	.562	.665	–	.618	.568	.567	.657	.616	.656
i35 Defender	.618	.645	.689	.599	–	.673	.602	.658	.689	.669
i36 Defender	.603	.621	.586	.549	.629	–	.699	.662	.634	.675
i37 Defender	.575	.533	.602	.568	.583	.643	–	.769	.689	.670
i38 Defender	.626	.595	.638	.639	.644	.622	.722	–	.752	.795
i39 Defender	.645	.641	.682	.624	.683	.609	.666	.719	–	.721
i40 Defender	.620	.618	.641	.641	.645	.646	.642	.727	.690	–
i41 Outsider	.095	.085	.110	.111	.039	.084	.136	.158	.085	.197
i42 Outsider	.075	.073	.116	.048	.100	.130	.110	.085	.013	.062
i43 Outsider	.018	.018	.047	-.060	-.048	.015	.070	-.012	-.039	.009
i44 Outsider	.122	.155	.122	.000	.052	.098	.123	.129	.145	.159
i45 Outsider	.024	-.028	.016	-.050	-.088	.036	.072	.013	.019	.001
i46 Outsider	.002	.018	.009	-.021	-.015	-.005	.083	.035	-.042	.018
i47 Outsider	.058	.006	.024	.046	.006	.026	.103	.011	.017	.077
i48 Outsider	.138	.023	.071	.047	.080	.080	.197	.146	.065	.115
i49 Outsider	.142	.005	.099	.073	.086	.093	.145	.121	.092	.092
i50 Outsider	.006	-.059	.024	.084	-.046	-.041	.086	.059	-.032	.067
M	1.355	1.436	1.224	.974	1.440	1.548	1.270	1.054	.963	1.010
SD	1.199	1.243	1.251	1.189	1.317	1.260	1.320	1.218	1.275	1.177
Sk	.929	.780	.923	1.251	.763	.676	.853	1.144	1.277	1.256
K	.096	-.323	-.118	.684	-.521	-.528	-.414	.423	.483	.796

					Bully Participant Behavior Questionnaire: **Outsider Items**					
Table A1 continued										
	i41	i42	i43	i44	i45	i46	i47	i48	i49	i50
i1 Bully	.315	.278	.258	.242	.201	.180	.276	.319	.347	.228
i2 Bully	.317	.252	.317	.320	.289	.302	.332	.358	.295	.278
i3 Bully	.339	.223	.277	.328	.288	.301	.217	.339	.272	.286
i4 Bully	.212	.163	.231	.191	.275	.266	.241	.285	.238	.299
i5 Bully	.358	.211	.210	.230	.249	.212	.251	.272	.196	.296
i6 Bully	.362	.240	.291	.319	.287	.322	.265	.283	.208	.399
i7 Bully	.425	.186	.256	.299	.294	.279	.233	.226	.159	.330
i8 Bully	.315	.149	.193	.222	.216	.256	.242	.391	.360	.362
i9 Bully	.298	.260	.281	.252	.228	.256	.319	.329	.279	.222
i10 Bully	.248	.259	.260	.269	.181	.232	.289	.296	.293	.153
i11 Assistant	.260	.251	.265	.252	.182	.239	.190	.247	.247	.222
i12 Assistant	.300	.145	.197	.239	.178	.235	.189	.207	.152	.274
i13 Assistant	.344	.182	.206	.268	.211	.339	.238	.245	.207	.266
i14 Assistant	.268	.177	.259	.254	.218	.205	.207	.294	.257	.256
i15 Assistant	.327	.183	.296	.268	.291	.245	.254	.286	.250	.220
i16 Assistant	.391	.284	.291	.392	.265	.356	.253	.232	.190	.314
i17 Assistant	.300	.234	.296	.266	.266	.330	.301	.334	.305	.227
i18 Assistant	.289	.215	.276	.318	.219	.334	.286	.352	.299	.261
i19 Assistant	.297	.193	.234	.198	.229	.280	.264	.291	.181	.219
i20 Assistant	.391	.174	.236	.253	.249	.262	.229	.202	.178	.274
i21 Victim	.212	.159	.158	.190	.107	.100	.167	.162	.112	.111
i22 Victim	.184	.124	.122	.190	.090	.090	.137	.147	.086	.110
i23 Victim	.242	.215	.159	.231	.117	.110	.142	.150	.178	.145
i24 Victim	.136	.211	.142	.202	.077	.097	.220	.201	.150	.076
i25 Victim	.192	.146	.156	.236	.067	.098	.180	.180	.160	.035
i26 Victim	.205	.173	.166	.277	.111	.124	.214	.201	.162	.081
i27 Victim	.166	.154	.073	.141	.102	.120	.113	.166	.127	.082
i28 Victim	.196	.155	.091	.198	.059	.078	.120	.146	.159	.082
i29 Victim	.144	.093	.115	.197	.042	.011	.062	.051	.081	.093
i30 Victim	.236	.166	.143	.260	.170	.072	.088	.122	.136	.073
i31 Defender	.032	.033	-.062	.040	-.059	-.055	-.028	.054	.056	-.096
i32 Defender	.038	.064	-.044	.088	-.074	-.046	-.035	-.032	-.037	-.130
i33 Defender	.046	.137	-.011	.066	-.035	-.015	-.044	.029	.050	-.043
i34 Defender	.022	.078	-.099	-.026	-.106	-.078	-.034	-.012	.000	-.035
i35 Defender	.011	.111	-.076	.012	-.074	-.029	-.034	.045	.035	-.077
i36 Defender	.031	.124	-.036	.029	-.001	-.042	-.033	.035	.032	-.108
i37 Defender	.081	.100	.014	.068	.032	.037	.018	.107	.077	-.017
i38 Defender	.058	.078	-.046	.065	.003	-.035	-.060	.043	.052	-.017
i39 Defender	.054	.045	-.072	.086	-.040	-.069	-.031	.043	.039	-.081
i40 Defender	.079	.077	-.065	.078	-.047	-.078	-.013	.025	.020	-.061
i41 Outsider	–	.487	.460	.454	.395	.400	.409	.265	.307	.379
i42 Outsider	.467	–	.426	.398	.346	.333	.333	.349	.344	.268
i43 Outsider	.505	.521	–	.664	.545	.548	.507	.473	.497	.450
i44 Outsider	.504	.438	.660	–	.510	.540	.487	.434	.493	.390
i45 Outsider	.501	.447	.580	.571	–	.554	.459	.523	.484	.471
i46 Outsider	.469	.418	.617	.593	.608	–	.468	.499	.420	.524
i47 Outsider	.522	.394	.548	.544	.567	.577	–	.602	.616	.407
i48 Outsider	.420	.449	.567	.540	.569	.585	.652	–	.693	.457
i49 Outsider	.441	.460	.606	.583	.578	.558	.686	.691	–	.457
i50 Outsider	.527	.418	.552	.518	.594	.655	.541	.576	.580	–
M	.324	.612	.411	.329	.281	.270	.441	.390	.388	.217
SD	.733	.969	.758	.716	.692	.642	.785	.820	.804	.668
Sk	2.940	1.859	2.551	2.779	3.290	3.117	2.304	2.580	2.739	4.062
K	9.849	3.137	8.011	8.759	12.345	11.583	6.199	6.922	8.325	18.214

Note. Smoothed polychoric correlations produced by EQS 6.3 (Bentler & Wu, 2012), Pearson correlations produced by SPSS 24 (IBM, 2016).

Table A2

Descriptive Statistics for Bully Participant Behavior Questionnaire Items with Middle School EFA and CFA Samples

Bullying Participant Behavior Questionnaire Item	EFA Sample (N = 392)				CFA Sample (N = 392)			
	M	SD	Sk	K	M	SD	Sk	K
Bully Items								
1. I have called another student bad names.	0.73	0.99	1.72	2.89	0.80	1.09	1.66	2.24
2. I have made fun of another student.	0.54	0.84	2.10	5.29	0.56	0.86	2.09	5.09
3. I have purposely left out another student.	0.26	0.66	3.36	13.14	0.28	0.69	3.59	15.13
4. I have pushed, punched, or slapped another student.	0.32	0.78	3.23	11.45	0.34	0.79	3.00	9.75
5. I have told lies about another student.	0.20	0.59	4.17	20.77	0.18	0.58	4.51	24.20
6. I have tried to make people dislike another student.	0.10	0.44	6.35	49.48	0.13	0.51	5.38	33.26
7. I have stolen things from another student.	0.07	0.40	8.07	72.88	0.08	0.46	7.28	55.98
8. I have thrown things at another student.	0.23	0.66	3.80	16.53	0.22	0.63	3.96	18.13
9. I have said bad things about another student.	0.52	0.82	2.07	5.13	0.52	0.91	2.37	5.97
10. I have talked about someone behind their back.	0.63	0.91	1.84	3.63	0.66	0.98	1.92	3.70
Assistant Items								
11. When someone was making fun of another student, I joined in.	0.27	0.65	3.35	13.68	0.29	0.62	2.74	9.96
12. When someone was verbally threatening another student, I joined in.	0.10	0.49	6.43	45.22	0.12	0.54	5.43	31.80
13. When someone bumped into another person, I joined in.	0.14	0.52	5.26	32.27	0.13	0.45	4.86	31.16
14. I have made fun of someone when they were pushed, punched, or slapped.	0.15	0.59	5.33	30.92	0.11	0.42	4.78	28.64
15. I have made fun of someone who was being called mean names.	0.17	0.61	4.72	24.50	0.16	0.45	3.28	11.97
16. When someone else broke something that belonged to another student, I stopped to watch.	0.24	0.67	4.01	18.53	0.20	0.55	3.99	20.55
17. When someone else tripped another student on purpose, I laughed.	0.37	0.77	2.92	9.94	0.36	0.76	2.85	9.48
18. When someone else knocked books out of another student's hands on purpose, I laughed.	0.13	0.59	5.64	33.25	0.11	0.46	5.85	40.59
19. When someone else pinched or poked another student, I joined in.	0.14	0.55	5.29	31.64	0.20	0.60	3.87	17.05
20. When someone else threw something at another student, I joined in.	0.07	0.44	7.60	62.33	0.11	0.47	5.88	39.75
Victim Items								
21. I have been called mean names.	1.40	1.39	0.78	-0.65	1.27	1.36	0.91	-0.34
22. I have been made fun of.	1.26	1.39	0.94	-0.41	1.15	1.30	1.00	-0.10
23. I have been purposely left out of something.	0.95	1.28	1.31	0.57	0.84	1.21	1.51	1.29
24. I have been ignored.	1.20	1.32	1.00	-0.15	1.18	1.33	1.00	-0.18
25. I have been pushed around, punched or slapped.	0.64	1.14	1.98	2.99	0.64	1.12	1.92	2.80
26. I have been pushed or shoved.	0.79	1.14	1.65	2.00	0.71	1.10	1.72	2.23
27. People have told lies about me.	1.10	1.36	1.08	-0.14	1.03	1.31	1.16	0.16
28. People have tried to make others dislike me.	0.93	1.33	1.37	0.59	0.84	1.24	1.52	1.23
29. I have been threatened by others.	0.59	1.14	2.10	3.39	0.52	1.01	2.21	4.29
30. I have had things taken from me.	0.60	1.11	1.99	3.00	0.51	0.98	2.21	4.35

Table A2 continues

Table A2 continued

Bully Participant Behavior Questionnaire Item	EFA Sample ($N = 392$)				CFA Sample ($N = 392$)			
	M	SD	Sk	K	M	SD	Sk	K
Defender Items								
31. I tried to become friends with someone after they were picked on.	1.35	1.20	0.93	0.10	1.23	1.12	1.05	0.56
32. I encouraged someone to tell an adult after they were picked on.	1.44	1.24	0.78	-0.32	1.31	1.21	0.94	0.03
33. I defended someone who was being pushed, punched, or slapped.	1.22	1.25	0.92	-0.12	1.11	1.23	1.12	0.34
34. I defended someone who had things purposely taken from them.	0.97	1.19	1.25	0.68	0.86	1.13	1.42	1.39
35. I defended someone who was being called mean names.	1.44	1.32	0.76	-0.52	1.27	1.20	0.96	0.14
36. I tried to include someone if they were being purposely left out.	1.55	1.26	0.68	-0.53	1.39	1.18	0.84	-0.07
37. I helped someone who had their books knocked out of their hands on purpose.	1.27	1.32	0.85	-0.41	1.10	1.21	1.14	0.49
38. I helped someone who was purposely tripped.	1.05	1.22	1.14	0.42	0.92	1.16	1.41	1.24
39. When I saw someone being physically harmed, I told an adult.	0.96	1.28	1.28	0.48	0.79	1.12	1.71	2.31
40. I defended someone who I thought was being tricked on purpose.	1.01	1.18	1.26	0.80	0.92	1.15	1.42	1.33
Observer Items								
41. I pretended not to notice when things were taken or stolen from another student.	0.32	0.73	2.94	9.85	0.35	0.74	2.86	9.68
42. I pretended not to notice when rumors were being spread about other students.	0.61	0.97	1.86	3.14	0.56	0.90	2.16	5.11
43. I ignored it when I saw someone making fun of another student.	0.41	0.76	2.55	8.01	0.44	0.82	2.49	6.98
44. I pretended not to notice a situation that purposely left someone out.	0.33	0.72	2.78	8.76	0.35	0.73	2.82	9.65
45. I ignored it when I saw someone breaking or damaging another student's things.	0.28	0.69	3.29	12.35	0.30	0.77	3.33	11.87
46. I pretended not to notice when someone else tripped another student on purpose.	0.27	0.64	3.12	11.58	0.30	0.67	2.99	10.74
47. I ignored it when someone else punched or poked another student.	0.44	0.79	2.30	6.20	0.42	0.80	2.44	6.89
48. I ignored it when someone else threw something at another student.	0.39	0.82	2.58	6.92	0.39	0.79	2.74	8.57
49. I ignored it when someone else tricked another student.	0.39	0.80	2.74	8.33	0.41	0.85	2.69	7.72
50. I pretended not to notice when someone was destroying another student's property.	0.22	0.67	4.06	18.21	0.26	0.73	3.69	14.77

Note. Sk = Skewness, *K* = Kurtosis. Mardia's (1970) normalized multivariate kurtosis estimate for the EFA sample was 249.99 and 246.03 for the CFA sample.

Table A3

Decomposed Sources of Variance for the Bully Participant Behavior Questionnaire for the Middle School CFA Sample (N = 392) According to a Bifactor Model (13a) with Two General Dimensions and Four Group Factors

Item/Role		Pro-bully		Bully/Assistant		Outsider		Victim		Defender		h^2	u^2	ECV
		b	S^2	b	S^2	b	S^2	b	S^2	b	S^2			
i1	Bully	.757	.573	-.274	.075							.648	.352	.884
i2	Bully	.779	.607	-.258	.067							.673	.327	.901
i3	Bully	.770	.593	-.081	.007							.599	.401	.989
i4	Bully	.707	.500	.047	.002							.502	.498	.996
i5	Bully	.723	.523	-.001	.000							.523	.477	.999
i6	Bully	.768	.590	.013	.000							.590	.410	.999
i7	Bully	.747	.558	.199	.040							.598	.402	.934
i8	Bully	.730	.533	.138	.019							.552	.448	.965
i9	Bully	.809	.654	-.259	.067							.722	.278	.907
i10	Bully	.697	.486	-.220	.048							.534	.466	.909
i11	Assistant	.739	.546	.143	.020							.567	.433	.964
i12	Assistant	.661	.437	.351	.123							.560	.440	.780
i13	Assistant	.611	.373	.420	.176							.550	.450	.679
i14	Assistant	.831	.691	.161	.026							.716	.284	.964
i15	Assistant	.782	.612	.035	.001							.613	.387	.998
i16	Assistant	.675	.456	.272	.074							.530	.470	.860
i17	Assistant	.675	.456	.038	.001							.457	.543	.997
i18	Assistant	.654	.428	.148	.022							.450	.550	.951
i19	Assistant	.652	.425	.385	.148							.573	.427	.741
i20	Assistant	.727	.529	.386	.149							.678	.322	.780
i41	Outsider	.634	.402			.531	.282					.684	.316	.588
i42	Outsider	.558	.311			.542	.294					.605	.395	.515
i43	Outsider	.577	.333			.579	.335					.668	.332	.498
i44	Outsider	.601	.361			.547	.299					.660	.340	.547
i45	Outsider	.531	.282			.611	.373					.655	.345	.430
i46	Outsider	.542	.294			.615	.378					.672	.328	.437
i47	Outsider	.519	.269			.637	.406					.675	.325	.399
i48	Outsider	.517	.267			.662	.438					.706	.294	.379
i49	Outsider	.557	.310			.639	.408					.719	.281	.432
i50	Outsider	.580	.336			.529	.280					.616	.384	.546
Total Variance			.458		.036		.116					.610	.390	
ECV			.751		.058		.191							
ω			.974		.962		.952							
ω_H /ω_{HS}			.892		.012		.499							

Table A3 continues

Table A3 continued

Item/Role		Pro-victim		Bully/ Assistant		Outsider		Victim		Defender		h^2	u^2	ECV
		b	S^2	b	S^2	b	S^2	b	S^2	b	S^2			
i21	Victim	.782	.612					.340	.116			.727	.273	.841
i22	Victim	.803	.645					.327	.107			.752	.248	.858
i23	Victim	.749	.561					.272	.074			.635	.365	.883
i24	Victim	.732	.536					.317	.100			.636	.364	.842
i25	Victim	.440	.194					.836	.699			.892	.108	.217
i26	Victim	.541	.293					.689	.475			.767	.233	.381
i27	Victim	.849	.721					.245	.060			.781	.219	.923
i28	Victim	.851	.724					.207	.043			.767	.233	.944
i29	Victim	.626	.392					.374	.140			.532	.468	.737
i30	Victim	.549	.301					.483	.233			.535	.465	.564
i31	Defender	.432	.187							.624	.389	.576	.424	.324
i32	Defender	.453	.205							.675	.456	.661	.339	.311
i33	Defender	.368	.135							.761	.579	.715	.285	.190
i34	Defender	.356	.127							.799	.638	.765	.235	.166
i35	Defender	.423	.179							.684	.468	.647	.353	.277
i36	Defender	.327	.107							.681	.464	.571	.429	.187
i37	Defender	.314	.099							.748	.560	.658	.342	.150
i38	Defender	.336	.113							.741	.549	.662	.338	.171
i39	Defender	.419	.176							.738	.545	.720	.280	.244
i40	Defender	.238	.057							.760	.578	.634	.366	.089
Total Variance			.318						.102		.261	.682	.318	
ECV			.467						.150		.383			
ω			.966						.956		.951			
ω_H/ω_{HS}			.599						.247		.755			

Note. ECV = explained common variance, ω = omega, ω_H = omega-hierarchical, ω_{HS} = omega-hierarchical subscale.

Table A4
Decomposed Sources of Variance for the Bully Participant Behavior Questionnaire Middle School CFA Sample (N = 392) According to a Bifactor Model (14a) with Two General Dimensions and Five Group Factors

Item/Role		Pro-bully b	Pro-bully S^2	Bully b	Bully S^2	Assistant b	Assistant S^2	Outsider b	Outsider S^2	Victim b	Victim S^2	Defender b	Defender S^2	h^2	u^2	ECV
i1	Bully	.666	.444	.397	.158									.601	.399	.738
i2	Bully	.702	.493	.338	.114									.607	.393	.812
i3	Bully	.733	.537	.221	.049									.586	.414	.917
i4	Bully	.701	.491	.120	.014									.506	.494	.972
i5	Bully	.691	.477	.215	.046									.524	.476	.912
i6	Bully	.736	.542	.219	.048									.590	.410	.919
i7	Bully	.762	.581	.072	.005									.586	.414	.991
i8	Bully	.736	.542	.083	.007									.549	.451	.987
i9	Bully	.688	.473	.597	.356									.830	.170	.570
i10	Bully	.581	.338	.521	.271									.609	.391	.554
i11	Assistant	.700	.490			.399	.159							.649	.351	.755
i12	Assistant	.682	.465			.366	.134							.599	.401	.776
i13	Assistant	.636	.404			.412	.170							.574	.426	.704
i14	Assistant	.881	.776			-.066	.004							.781	.219	.994
i15	Assistant	.775	.601			.037	.001							.602	.398	.998
i16	Assistant	.716	.513			.087	.008							.520	.480	.985
i17	Assistant	.709	.503			-.161	.026							.529	.471	.951
i18	Assistant	.715	.511			-.137	.019							.530	.470	.965
i19	Assistant	.681	.464			.306	.094							.557	.443	.832
i20	Assistant	.762	.581			.271	.073							.654	.346	.888
i41	Outsider	.632	.399					.533	.284					.684	.316	.584
i42	Outsider	.520	.270					.579	.335					.606	.394	.446
i43	Outsider	.579	.335					.578	.334					.669	.331	.501
i44	Outsider	.598	.358					.550	.303					.660	.340	.542
i45	Outsider	.563	.317					.580	.336					.653	.347	.485
i46	Outsider	.554	.307					.604	.365					.672	.328	.457
i47	Outsider	.527	.278					.630	.397					.675	.325	.412
i48	Outsider	.536	.287					.643	.413					.701	.299	.410
i49	Outsider	.568	.323					.628	.394					.717	.283	.450
i50	Outsider	.600	.360					.509	.259					.619	.381	.582
Total Variance			.449		.036		.023		.114					.621	.379	
ECV			.722		.057		.037		.184							
ω			.975		.934		.932		.952							
ωH /ωHS			.878		.128		.039		.489							

Table A4 continues

Table A4 continued

Item/Role		Pro-victim		Bully		Assistant		Outsider		Victim		Defender		h^2	u^2	ECV
		b	S^2	b	S^2	b	S^2	b	S^2	b	S^2	b	S^2			
i21	Victim	.782	.612							.341	.116			.728	.272	.840
i22	Victim	.803	.645							.327	.107			.752	.248	.858
i23	Victim	.748	.560							.272	.074			.633	.367	.883
i24	Victim	.732	.536							.317	.100			.636	.364	.842
i25	Victim	.440	.194							.836	.699			.892	.108	.217
i26	Victim	.540	.292							.689	.475			.766	.234	.381
i27	Victim	.849	.721							.245	.060			.781	.219	.923
i28	Victim	.850	.722							.207	.043			.765	.235	.944
i29	Victim	.626	.392							.375	.141			.533	.467	.736
i30	Victim	.549	.301							.483	.233			.535	.465	.564
i31	Defender	.432	.187									.624	.389	.576	.424	.324
i32	Defender	.453	.205									.675	.456	.661	.339	.311
i33	Defender	.368	.135									.761	.579	.715	.285	.190
i34	Defender	.356	.127									.799	.638	.765	.235	.166
i35	Defender	.423	.179									.684	.468	.647	.353	.277
i36	Defender	.327	.107									.681	.464	.571	.429	.187
i37	Defender	.314	.099									.748	.560	.658	.342	.150
i38	Defender	.336	.113									.741	.549	.662	.338	.171
i39	Defender	.419	.176									.738	.545	.720	.280	.244
i40	Defender	.237	.056									.760	.578	.634	.366	.089
Total Variance			.318								.102		.261	.681	.319	
ECV			.466								.150		.383			
ω			.966								.956		.951			
ω_H / ω_{HS}			.599								.248		.756			

Note. ECV = explained common variance, ω = omega, ω_H = omega-hierarchical, ω_{HS} = omega-hierarchical subscale.
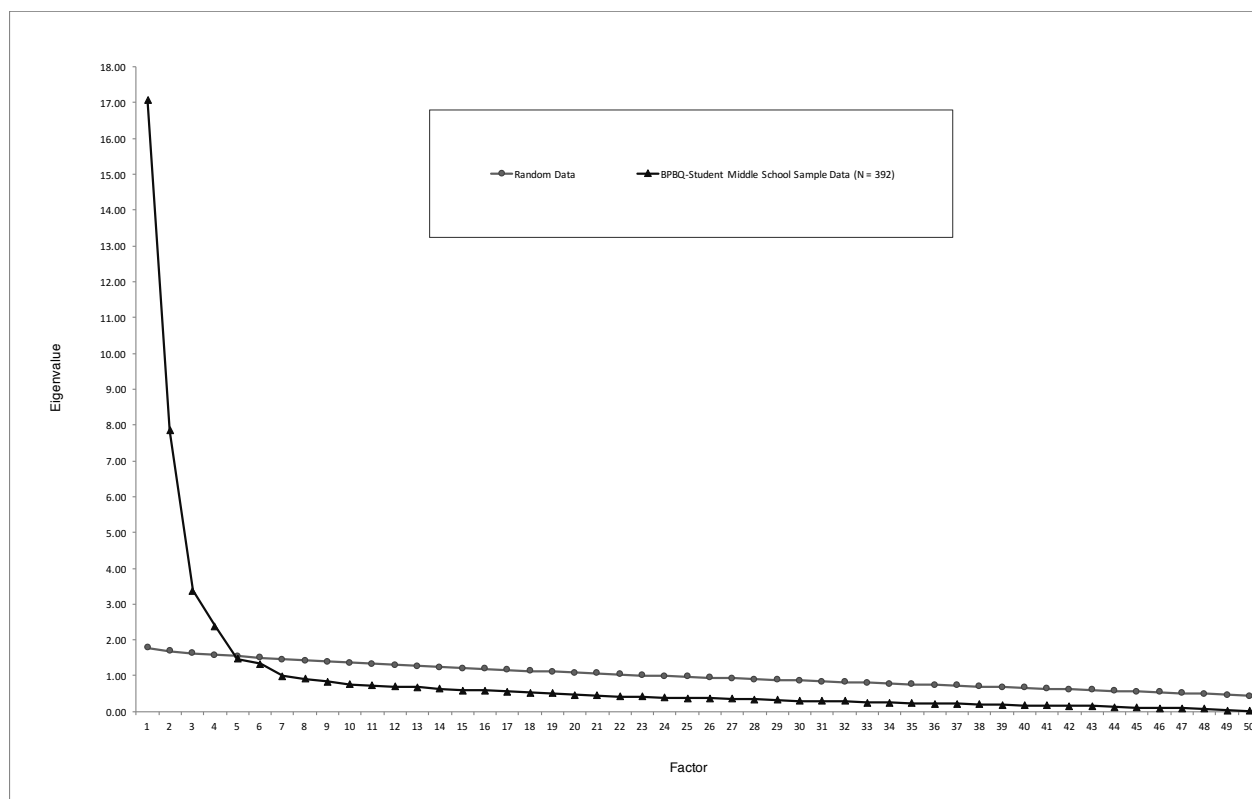
Figure A1. Scree plots for Horn's parallel analysis for the BPBQ middle school EFA (*n* = 392).
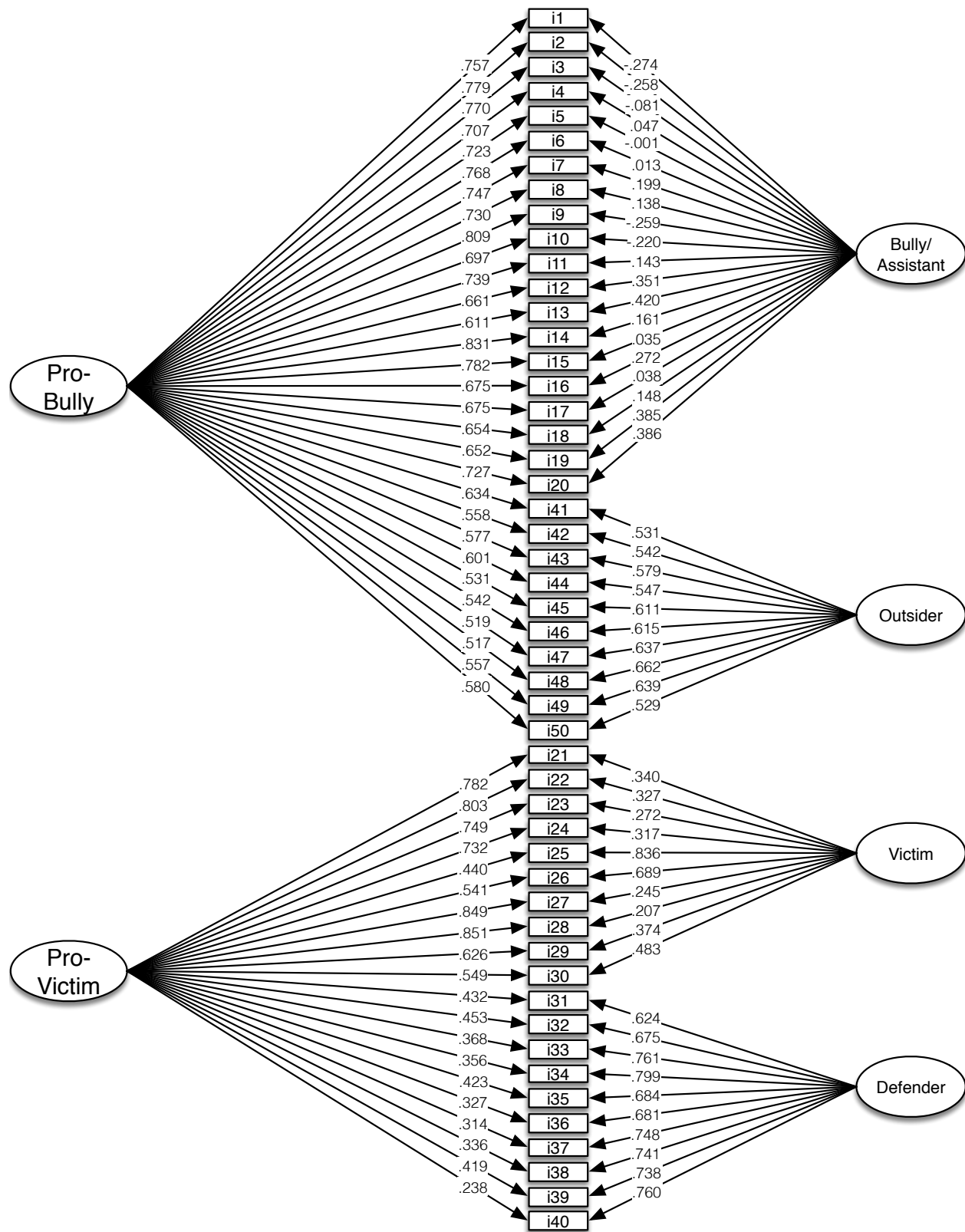
Figure A2. CFA bifactor measurement model with two general and four group factors (Model 13a) with standardized coefficients for the BPBQ middle school sample.
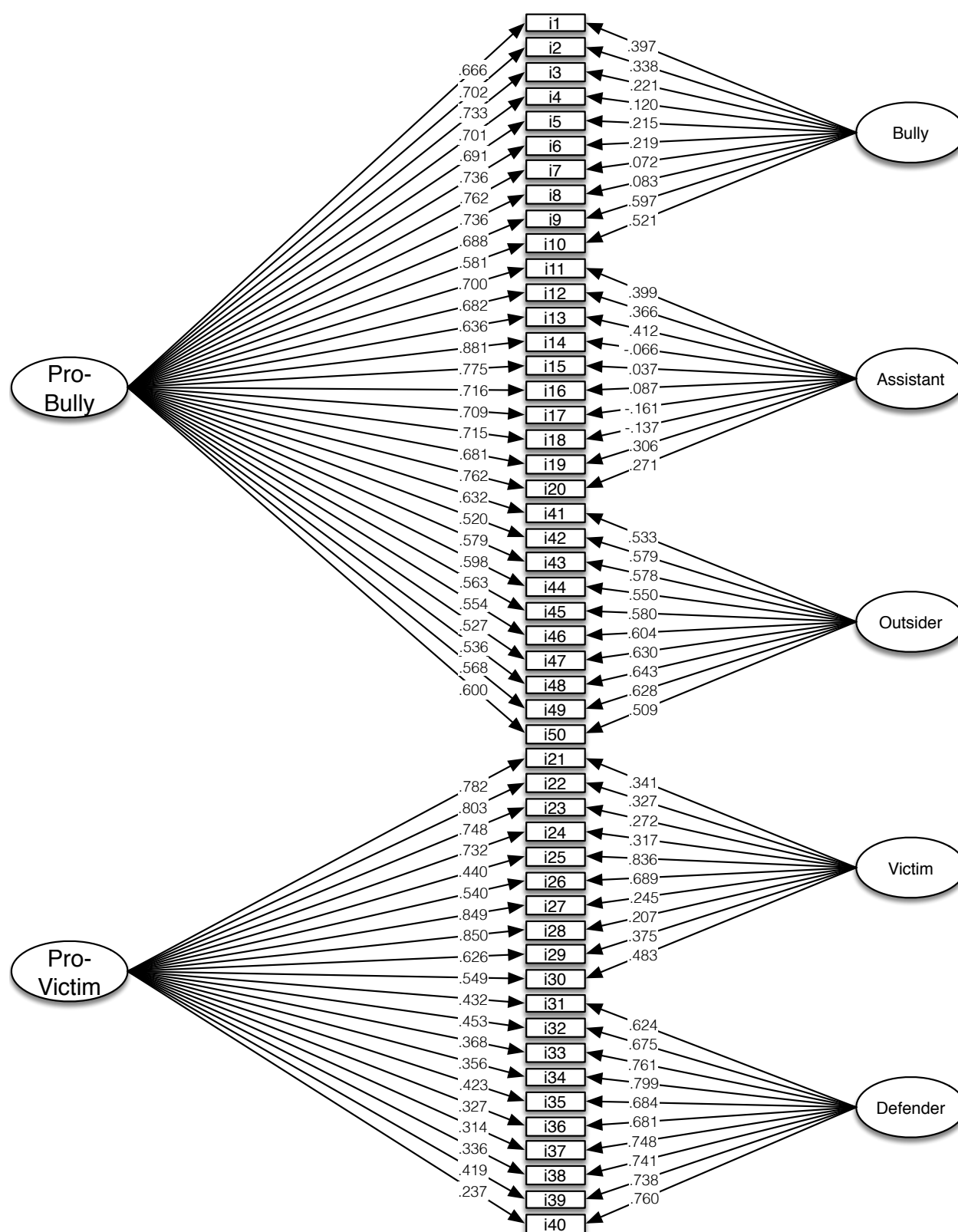
Figure A3. CFA bifactor measurement model with two general and five group factors (Model 14a) with standardized coefficients for the BPBQ middle school sample.