

University of Memphis

University of Memphis Digital Commons

---

Electronic Theses and Dissertations

---

2021

## A Longitudinal Examination of the Relation of Profiles of Children Based on Overt, Relational, and Cyber Aggression, to Assessments of Peer Liking and Popularity

Robert Washington

Follow this and additional works at: <https://digitalcommons.memphis.edu/etd>

---

### Recommended Citation

Washington, Robert, "A Longitudinal Examination of the Relation of Profiles of Children Based on Overt, Relational, and Cyber Aggression, to Assessments of Peer Liking and Popularity" (2021). *Electronic Theses and Dissertations*. 2831.

<https://digitalcommons.memphis.edu/etd/2831>

This Dissertation is brought to you for free and open access by University of Memphis Digital Commons. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of University of Memphis Digital Commons. For more information, please contact [khggerty@memphis.edu](mailto:khggerty@memphis.edu).

A LONGITUDINAL EXAMINATION OF THE RELATION OF PROFILES OF  
CHILDREN BASED ON OVERT, RELATIONAL, AND CYBER AGGRESSION, TO  
ASSESSMENTS OF PEER LIKING AND POPULARITY

by

Robert Washington II

A Dissertation

Submitted in Partial Fulfillment of the

Requirements for the degree of

Doctor of Philosophy

Major: Clinical Psychology

The University of Memphis

August 2021

## **Abstract**

The present research examined the association of empirically derived, person centered profiles based on overt, relational, and cyber aggression to peer liking and popularity over a two-year period. Children from six cohorts of grades 3 – 5 (IRB approved) participated in the study (boys = 127, girls = 165; primarily middle-class SES families). A latent profile analysis (LPA) was conducted using third grade levels of the three subtypes of aggression. Three distinct groups were identified: non-aggressive (low in all three forms), traditionally aggressive (high only in overt and relational aggression), cyber aggressive (only high in cyber aggression). Growth curve models indicated that the non-aggressive group showed a higher initial level in popularity and a slower rate of change in both popularity and liking over time than the traditionally aggressive group. The non-aggressive group showed higher initial rates of popularity and peer liking compared to the cyber aggressive group. Lastly, the traditionally aggressive group showed a higher initial rate and higher rate of change in popularity and peer liking compared to the cyber aggressive group. These findings highlight that subtypes of aggression may serve different social functions for children, over time, and the importance of a person-centered approach for exploring these associations of subtypes to peer social standing.

## Table of Contents

Chapter	Page
List of Tables	iv
List of Figures	v
1. Introduction	1
Defining Aggression	2
Overview of Research on Overt, Relational, and Cyber Aggression	3
Overt and Relational Aggression	3
Cyber Aggression	5
Relation of Aggression to Peer Social Standing	6
The Present Research	9
2. Methods	10
Participants	10
Measures	11
Classroom Overt and Relational Aggression Behaviors	11
Cyber Aggression	12
Peer Liking	12
Peer Popularity	12
Procedure	13
3. Results	13
4. Discussion	29
Limitations and Future Directions	33
5. Conclusion	35
References	36

## List of Tables

Table	Page
1. Correlations Among Different Forms of Aggression Across Grades 3, 4, 5, with Means and Standard Deviations (SD).	15
2. Correlations Among Peer Liking Nominations and Popularity Nominations Across Grades 3, 4, 5, with Means and Standard Deviations (SD).	16
3. Correlations Among Different Forms of Aggression and Peer Liking and Popularity Nominations Across Grades 3, 4, 5.	17
4. Fit Statistics for LPA	19
5. Fit Statistics for Growth Models	21
6. Growth Curve Model with Gender Statistics	26
7. Model Constraint Comparisons for All Parameters	28

## List of Figures

Figure	Page
1. Graph of Latent Profiles with 95% Confidence Interval Error Bars	20
2. Peer Popularity Growth Curve Model Conceptual Model	22
3. Peer Liking Growth Curve Model Conceptual Model	23
4. Peer Popularity Intercept and Slope	27
5. Peer Liking Intercept and Slope	27

## A Longitudinal Examination of the Relation of Profiles of Children Based on Overt, Relational, and Cyber Aggression, to Assessments of Peer Liking and Popularity

The study of aggression and the study of the importance of peer group standing have a long and interrelated history within the fields of children's peer relations, (e.g., see Dodge, Coie, & Casper & Card, 2017). A common and useful form of aggressive behaviors extensively studied are overt and relational aggression. Recently, with the increased availability of virtual media in children's lives, the study of aggression has extended to the examination of cyber aggression. Since the publication of Coie, Dodge and Coppotelli (1982), there has been tremendous interest in the role of peers for children's development and adjustment. Quite consistently, it has been shown that being accepted by peers, often evaluated as liking and popularity by peers, is crucial for adjustment and successful development. The connections between these threads of aggression and peer relations are well established. It has been reported consistently in the research literature that engaging in aggression is associated with a large variety of peer social measures in a negative fashion (Casper & Card, 2017).

The present research expands our understanding of the relation of aggression to peer relations in a number of ways. The vast majority of work on aggression and peer relations has been cross sectional and variable centered and does not include multiple forms of aggression within a single study. This research has certainly been informative and useful, but arguably much can be gained through a longitudinal, person-centered approach, which evaluates multiple forms of aggression.

The present research, employing Latent Profile Analysis, considers empirically derived classes or profiles of children based on their peer nominations for overt aggression and relational aggression, and self-reports of cyber aggression. Membership in these classes was related to

children's liking and popularity for grades 3, 4, and 5, using longitudinal data. In sum, this research offers a comprehensive analysis of several forms of aggression using a person-centered, longitudinal analysis in relation to two important measures of peer group relations. Following consideration of definitions of aggression and subtypes of aggression (overt, relational, cyber), we provide a general overview of research on overt, relational, and cyber aggression. The next section reviews research documenting the association of aggression and peer social competence with an emphasis on research evaluating liking and popularity. The final section provides an overview of the present research. A conceptual simplification used in this manuscript should be noted. Throughout this manuscript the association of gender is considered and is discussed as a binary variable in the manner that researchers have used for many years. We recognize the limitation of this simplification.

### **Defining Aggression**

As noted above, aggression has had a number of definitions in the research literature, and indeed, the constructs of aggression and aggressive behaviors are difficult to unambiguously hard to define. One of the more comprehensive definitions, by Braine (1994), suggests four components: (a) intentional acts, with (b) the potential for harm, (c) committed by an individual in an aroused physical state, and (d) perceived as aversive by the victim. Research has documented that children engage in aggressive behaviors fairly early in life, certainly by preschool age. Concerning contributing factors, researchers have focused on heritability (Porsch et al. 2016), the influence of parents (Labella & Masten, 2018), and the influence of peers (Malonda, Llorca, Mesurado, Samper, & Mestre, 2019) as important factors in the development of aggression. Rates and types of aggression change with age (see Dodge et al, 2006). Generally, rates of physical, overt aggressive behaviors decrease after around age 5 with more indirect and social forms of aggression (e.g., relational aggression) increasing (Dodge et al., 2006; Underwood, Beron, & Rosen, 2009).



It bears noting that the term “aggression” often has been used interchangeably with the term “bullying.” Although there are similarities in the form and intent of the behaviors, there are distinct differences that set these two terms apart. Unlike aggression, bullying involves (a) repeated acts of harm over time between perpetrator(s) targeting victim(s), as well as (b) a clear power differential between perpetrator(s) and victim(s) (Olweus, 1987). All bullying is aggression, but not all aggression should be considered bullying. The present research focusses on aggression.

### **Overview of Research on Overt, Relational, and Cyber Aggression**

Underwood (2011) noted that more than 200 definitions of aggression exist and at least as many proposed forms or subtypes of aggression exist as well. A useful conceptual distinction to help understand these subtypes is Little (2003). Little suggested that some subtypes of aggression relate to “functions” of aggression. Other subtypes relate to “forms” of aggression. The most common forms of aggression evaluated in the last two decades, arguably, have been overt and relational aggression, which are the focus of the present research, along with the newer emerging form, cyber aggression. Both overt and relational aggression have been consistently shown to be associated with many negative peer relation social competence measures and detailed more fully below. Although considerably less studied, cyber aggression has been shown also to be associated with many negative peer relation social competence measures also detailed more fully below.

**Overt and relational aggression.** Overt aggression refers to acts of direct aggression that may be physical and/or verbal. It generally emerges during the second year of life and is prevalent in the preschool years (Tremblay 1999). Ladd and Price (1987) found that children observed to be more overtly aggressive in preschool were more likely to be socially rejected by their peers in kindergarten. Overt aggression is so common in the preschool years that it may be considered normative behavior (Tremblay, 1999). As children begin elementary school, overt

aggression is still prominent but at lower rates than during preschool (Underwood, Galen, and Paquette, 2001). Furthermore, the rate of overt aggression behaviors continues to decrease as children develop. This may be because children are more aware of the social norms surrounding aggression and make more of a commitment to comply to these norms. It is also likely that social environments such as school are considerably less accepting of these behaviors than social environments of preschoolers.

Gender differences in the frequency of overtly aggressive behavior are very common in the literature. Boys typically engage in more overt aggression than girls. However, this difference becomes wider as children grow older. As previously stated, overt aggression develops as early as a child's second year. However, gender differences often don't begin to appear until children reach the preschool years (Björkqvist, 2018). This timeframe coincides with the differences in the way that boys and girls are socialized (Maccoby, 1998). The rough-and-tumble play often present in boys' physical play with peers may promote more aggressive behaviors (Martin & Fabes, 2001). Also, it has been suggested that overt aggression is not generally an acceptable social/cultural behavior for girls (Fagot, Leinbach, & Hagan, 1986). Interestingly, although girls engage in less overt aggression, when they do, they are usually subjected to the same social consequences from peers (i.e., negative consequences; Underwood and Coie, 2004).

Relational aggression refers to a form of aggression in which the intent to harm is accomplished by damaging a target's relationships or social status (Romero-Abrio, Martínez-Ferrer, Sánchez-Sosa, & Musitu, 2019). Relationally aggressive behaviors primarily involve the direct (and indirect) manipulation of peer relationships. The primary goal of relational aggression is to negatively impact the peer relationships and social status of a peer and may be a direct

attack (e.g., “I’m not inviting you to my party.” or a more subtle indirect attack through another peer (e.g., “Let’s not play with him/her.”). Relational aggression has been shown to occur as early as age 3 and becomes more sophisticated as children age (Crick et al, 2007). Research has shown that both boys and girls engage in relational forms of aggression (Matheison et al., 2011) and gender differences for relational aggression, unlike with overt aggression, are not consistently reported. In sum, girls engage in more relational than overt aggression; boys are comparable to girls in the use of relational aggression and far exceed the rates for girls for overt aggression.

**Cyber aggression.** With the tremendous increase in availability and use of electronic media, cyber aggression has emerged as a new form of aggression. Children as young as elementary school ages have been reported to engage in a great deal of virtual social activities. Recent research has shown that 94 percent of children ages 3 to 17 years, spend time daily on the internet (United States Department of Commerce, 2016). This time spent online interacting with other children provides more opportunities for children to aggress against each other using the internet and electronic media as a medium.

Like other forms of aggression, cyber aggression is defined as the intent to harm or demean other individuals and is perceived as aversive by the victim. The primary unique characteristic of cyber aggression is that the harm is conveyed through media use, for example, email or social media, with computers, cell phones, and/or other electronic devices, (Hinduja & Patchin, 2008; Ybarra & Mitchell, 2004; Ybarra, Diener-West, & Leaf, 2007). This definition closely corresponds to the definition of traditional aggression that is often used and is reported above, with the inclusion of the use of technology as the medium. As with traditional aggression,

the particular acts used to define cyber aggression may vary across studies (Berne et al., 2013; Slonje, Smith, & Frisen, 2013; Tokunaga, 2010).

Cyber aggression can occur anywhere the technology is accessible. It has been argued that cyber aggression may be more pervasive than traditional aggression (Tokunaga 2016) This is due to defining characteristics that separate cyber aggression from more traditional forms of aggression. For instance, children who are victims of cyber aggression are more vulnerable than victims of traditional aggression due to the extended access that potential perpetrators may have with their victims. Furthermore, unlike engaging in traditional aggression which can be monitored by teachers and school administration personnel, cyber aggression typically has no authority persons tasked with policing the act (Holt & Keyes, 2004). In sum, as noted by Englander and Muldowney (2010), cyber aggression can be considered an offense that results in harm without direct physical interaction, requires little planning, and has a reduced threat of being caught.

### **Relation of Aggression to Peer Social Standing**

As stated at the beginning of this Introduction, successfully navigating peer social contexts has been consistently documented to be critical for children's adjustment and development (see Rubin, Bukowski, & Parker, 2006 for a review). A very common and important index of peer relations has been the use of peer social standing, i.e., how are children accepted and evaluated as members of the peer group. A great deal of research has documented negative associations of aggression with peer social competence, particularly the forms of aggression evaluated in the present research: overt, relational, and cyber aggression.

Kashani et al. (1997) found that children ages 6-12, with low social competence were more likely to use aggression than their more socially competent peers. Longitudinal studies

have also consistently found that aggression is a strong predictor of future social problems such as peer rejection and peer victimization (Coie 1998). Hektner et al. (2000) found that highly aggressive 7- and 8-year-olds had fewer reciprocal friends than did nonaggressive youth and were likely to lose friends during a 6-week summer camp. Furthermore, Casper and Card (2017) found that aggressive children were likely to cause problems in peer relationships and be rejected by their peers. The negative consequences that are associated with aggression are not limited to one particular subtype. Negative associations have been found for both relational and overt aggression. For instance, Crick, Ostrov, and Werner (2006) reported that relational aggression observed in third graders was a risk factor for future social–psychological adjustment in fourth grade and children who exhibited both relational and overt aggression were at increased risk for adjustment problems.

Interestingly some research reports that children may strategically use aggression in an attempt to improve or maintain social status. In support of this, some previous research has found that subsets of aggressive children are socially skilled, morally astute, and socially alluring (e.g., Bost, Vaughn, Washington, Cielinski, & Bradbard, 1998; Sutton, Smith, & Swettenham, 1999). It has been suggested that children may use aggressive strategies to ultimately increase their social status (Hawley, Little, & Card, 2008). In short, aggressive behaviors are complex and the social associations of the use of aggression are highly context dependent.

Adding complexity to the relation of aggression to social competence, some measures of social competence, particularly those relating to peer standing, have been shown to be *positively* related to the use of aggression. Literature on peer popularity exemplifies this complexity. Popularity has been considered with two constructs, sociometric popularity (“Who do you like the most?”) and perceived popularity (“Who do you think is the most popular?”). Sociometric

popularity is a measure of peer group preference or likeability. Perceived popularity reflects a more direct assessment of popularity among the peer group regarding who is deemed visible and dominant (Cillessen & Rose, 2005; Lease, Kennedy, & Axelrod, 2002). Overt aggression is virtually always associated with peer disliking (low sociometric popularity; see Dodge, Coie, & Lynam, 2006). Underwood (2003) found that overt aggression was associated with peer rejection for elementary-school aged children. However, there are some studies that show overt aggression may be positively associated with perceived popularity (Rodkin et al., 2000). In addition, some research suggests that popularity may be positively associated with relational aggression (e.g., Cillessen & Mayeux, 2004). LaFontana and Cillessen (2002) found that relational aggression may lead to an increase in popularity in a child's peer group. Furthermore, perceived popularity predicted an increase in overt aggression for both boys and girls during the transition from elementary to middle school. In sum, likeability by the peer group (sociometric popularity) decreases with aggression; direct measures of prominence (perceived popularity) may be associated with high levels of aggression.

Previous research has shown that aggressors are more likely to place importance on status goals (Ojanen, Grönroos, & Salmivalli, 2005; Sijtsema, Veenstra, Lindenberg, & Salmivalli, 2009). There are many ways that children may use aggression to their benefit in peer relationships. Prior research has suggested that aggressive individuals gain or maintain popularity by targeting low-status members of the group (Salmivalli & Peets, 2009; Sijtsema et al., 2009). It may be the case that children strategically decide when to be aggressive in an attempt to increase their social status. Adler and Adler (1998) suggested that although adolescents who appear to value popularity may be at increased risk for engaging in aggression, popularity may influence the nature of these aggressive behaviors. For example, those who are

viewed as popular by their peers appear to engage in strategic aggression to maintain their status within the group, whereas unpopular individuals who have a reputation for striving for popularity seem to use aggression in desperate attempts to impress popular peers (Van den Berg, Burk, Cillessen, 2019). At the very least the results of this study have shown that the relation between aggression and social status is complex.

As noted, much less research has related the use of cyber aggression to peer social competence. However, previous research has documented similar effects for cyber and traditional aggression, with both victims and perpetrators of cyber aggression experiencing negative social outcomes (Schoffstall & Cohen 2011). Schoffstall and Cohen (2011), with third through sixth graders, found that cyber aggression was positively related to loneliness, and negatively related to global self-worth, peer optimism, number of mutual friendships, sociability, and perceived popularity, after controlling for effects attributable to classroom, traditional aggression. Washington, Cohen, Berlin, Hsueh, and Zhou, (2018) found that for school-aged children, the peer relations negative effects associated with cyber aggression may be more pervasive for boys.

### **The Present Research**

As reviewed above, the area of aggression has a long history in psychology in general and developmental psychology in particular. A particular concentration of this interest in the last 30 years has been on the relation of aggression to peer social competence, particularly in relation to peer social standing. Also as reviewed above, although the use of aggression generally has negative social consequences, under some conditions, with some children, and with some measures (e.g., perceived popularity), aggression can be associated with positive, constructive outcomes. The extent research has largely been cross sectional in design; has not used a person-

centered design; and has not directly evaluated overt, relational, and cyber aggression in the same study. The present research extends our understanding of the relation of aggression to peer popularity (sociometric and perceived) by addressing these gaps.

The present research, with longitudinal data of third to fifth graders used a latent profile analysis. Classes (profiles) of children were empirically derived for third graders based on peer reports of overt and relational aggression and on self-reports of cyber aggression. These profiles were related to levels of liking and perceived popularity for children longitudinally, in grades 3, 4, and 5. Gender differences were considered. Also, due to the nature of the data, involving several sequential cohorts of children, cohort differences were examined.

## **Method**

### **Participants**

Children attending a university-affiliated public elementary school were selected to participate. The sample of 292 students consisted of 127 boys and 165 girls from grades 3-5 (70% White, 28% African American, 2% Other ethnicities). The participants were predominately middle-class background as evidenced by less than 20% of the children in the school receiving any lunch subsidy.

Data were selected from a longitudinal investigation of children's peer relations conducted at a university-affiliated public school. Participants were selected from archival data. Therefore, only children with complete data sets were selected. The part of the data set that was used came from sequential cohorts of children in third, then fourth, then fifth grade, for example, children assessed in Fall 2011 as third graders; Fall 2012 as fourth graders; and Fall 2013 as fifth graders (n=49). Additional, independent samples came from cohorts of children assessed Fall 2012 (Grade 3), Fall 2013 (Grade 4), and Fall 2014 (Grade 5) (n= 63), and cohorts of children



assessed Fall 2013 (Grade 3), Fall 2014 (Grade 4), and Fall 2015 (Grade 5) (n = 50), Fall 2014 (Grade 3), Fall 2015 (Grade 4), and Fall 2016 (Grade 5) (n = 47), Fall 2015 (Grade 3), Fall 2016 (Grade 4), and Fall 2017 (Grade 5) (n = 43), Fall 2016 (Grade 3), Fall 2017 (Grade 4), and Fall 2018 (Grade 5) (n = 40).

Parents of all children at the school were contacted for participation. The school is highly research-focused, and parents' consent at enrollment to allow their children to participate in a wide range of studies, each of which they are specifically informed about and given the opportunity to decline participation for their children. Information about the present study was mailed to parents who were given the opportunity to opt out of the research with assurance of no penalty to their children. An Institutional Review Board and school administrators approved the research protocol.

## **Measures**

The present research included five measures that addressed the primary research questions: classroom peer behavior nominations for overt and relational aggression; self-reported use of cyber aggression; and classroom peer nominations for liking (sociometric popularity) and for popularity (perceived popularity). Revised class play has been used by numerous studies and has evidence of reliability and validity (Masten, Morison, & Pellegrini, 1985). For the sake of brevity, sociometric popularity will be referred to as "likeability" and perceived popularity will be referred to as "popularity."

*Classroom Overt and Relational Aggression Behaviors* Peer evaluations of aggression were assessed using the Revised Class Play procedure (Masten, Morison, & Pellegrini, 1985). Children were provided classroom rosters and told they were to pretend that they were the director of a play. They were instructed to "cast" their fellow classroom classmates (unlimited

nominations, no self-nominations) as characters in a play based on which classmate(s) they believed would best fit certain roles. Five items assessed overt aggression and three items assessed relational aggression. The five items assessing overt aggression behaviors were: “A person who threatens people”; “Somebody who teases other children too much”; “Someone who gets into fights for little or no reason”; “A person who jokes around in a mean way”; and “A person who fights.” The relational aggression behaviors items were: “A person who threatens people;” “Somebody who teases other children too much;” and “A person who fights when others wouldn’t.”

**Cyber Aggression** Children completed a self-report measure to assess cyber aggression. Children indicated their responses using a 4-point scale, anchored as: *never*, *rarely*, *sometimes*, and *often*. Four of the 15 items were used in the current research (“Have you ever bullied someone using the internet or a text message?”, “Have you ever teased someone in a mean way using the internet or a text message?”, “Have you ever called someone hurtful names using the internet or a text message?”, and “Have you ever spread rumors using the internet or a text message?”) Responses were summed (never = 0, often = 3) to get an overall score for cyber aggression for each child (range = 0–12).

**Peer Liking** Children were given a classroom roster and asked to circle those classroom classmates they liked the most (unlimited nominations). To control for differences in class size, total numbers of liking nominations received by each child were standardized by classroom.

**Peer Popularity** Children were given a classroom roster and asked to circle those classroom classmates they believed to be the most popular (unlimited nominations). To control for differences in class size, total numbers of popularity nominations received by each child were standardized by classroom.

## **Procedure**

The University Institutional Review Board (IRB) approved the measures and procedure for this study for all years of the study. At school enrollment, parents provided consent to allow their children to participate in a wide range of studies occurring at the school. For each study, parents were given specific information about each research project being conducted, as well as the opportunity to decline participation for their children in specific studies or all studies. Information about the present study was mailed to parents each year who were informed there would be no penalty to their child if they chose to opt out of the research study. Children were informed about the purpose of the research and confidentiality at the beginning of the data collection session. Additionally, children were informed of their right to refuse or discontinue participation at any time with no penalty. In any given year, approximately six parents declined participation and one child refused to participate.

The children were administered questionnaires in two 50-minute sessions, by classroom, in the library of the school. The sessions were led by at least two graduate students and additional graduate and undergraduate research assistants were also present. A session leader read the instructions aloud and the other researchers gave individual assistance as needed.

## **Results**

As preliminary analyses, correlations, means, and standard deviations were calculated using SPSS. The primary analysis was conducted in two parts. First, a Latent Profile Analysis was conducted using Mplus 8.4. Third grade levels of relational, overt, and cyber aggression were used as predictors to determine the profiles. BCH weights were saved using the auxiliary function in Mplus. Next a linear Growth Curve Model was constructed to determine the rate of change for peer liking and peer popularity nominations over a child's third and fourth grade

years. As a follow up analysis, a model constraint was conducted using the BCH from the latent profile analysis to explore potential significant mean differences in the rates of change in third and fourth grade peer liking, and popularity based on third grade profiles of aggression. Results are discussed below.

Correlations, means, and standard deviations for all variables are presented in Tables 1, 2, and 3. Results revealed a variety of significant correlations. Most relevant to the present study, third grade overt aggression was significantly (negative) associated with peer liking at time 3 and peer popularity at time 1 and time 3. Third grade relational aggression was significantly (negative) associated with peer liking at time 1 and time 3. Third and fourth grade cyber aggression were not significantly associated with peer liking or peer popularity at any time point. Fourth grade overt aggression was significantly and negatively associated with peer popularity at time 2. Fourth grade relational aggression was significantly (negative) associated with peer liking at time 2 and peer popularity at time 3. Interestingly fourth grade relational and overt aggression were both significantly (negative) associated with cyber aggression at time 3. Overall, correlations revealed different patterns of association for each subtype of aggression. Generally, negative correlations were found between overt aggression, relational aggression, popularity, and peer liking. Cyber aggression did not reveal any significant associations with peer liking or popularity. However, it was negatively associated with other subtypes of association in the fourth grade.

Table 1

Correlations among different forms of aggression across Grades 3, 4, 5, with Means and Standard Deviations (SD)

	1	2	3	4	5	6	7	8	9	Mean	SD
1. Grade 3 Overt Aggression	–									4.22	7.28
2. Grade 3 Relational Aggression	.53	–								2.96	3.39
3. Grade 3 Cyber Aggression	.11	.12*	–							4.29	.99
4. Grade 4 Overt Aggression	.21**	.34**	.01	–						4.07	7.04
5. Grade 4 Relational Aggression	.21**	.44**	-.02	.84**	–					4.35	5.49
6. Grade 4 Cyber Aggression	.11	-.01	.10	.03	-.03	–				4.35	1.05
7. Grade 5 Overt Aggression	.66*	.43**	.04	.40**	.30**	.07	–			3.91	7.24
8. Grade 5 Relational Aggression	.51**	.55**	.05	.51**	.49**	.02	.77**	–		4.02	5.29
9. Grade 5 Cyber Aggression	.07	.01	.04	-.15*	-.28**	.33**	.10	.11	–	3.79	1.38

Note \* =  $p < .05$ , \*\* =  $p < .001$

Table 2

Correlations among peer liking nominations and popularity nominations across Grades 3, 4, 5, with Means and Standard Deviations (SD)

	1	2	3	4	5	6	Mean	SD
1. Grade 3 Peer Liking	—						6.95	3.82
2. Grade 3 Peer Popularity	.69**	—					4.95	3.31
3. Grade 4 Peer Liking	.29**	.19**	—				6.39	3.74
4. Grade 4 Peer Popularity	.34**	.48**	.60**	—			4.70	3.80
5. Grade 5 Peer liking	.13*	.11	.40**	.39**	—		5.48	3.38
6. Grade 5 Peer Popularity	.12*	.27**	.35**	.60**	.68**	—	5.17	4.65

Note \* =  $p < .05$ , \*\* =  $p < .001$

Table 3

Correlations among different forms of aggression and peer liking and popularity nominations across grades 3, 4, 5

	Grade 3		Grade4		Grade 5	
	Liking	Popularity	Liking	Popularity	Liking	Popularity
Grade 3 Overt Aggression	-.28	-.15*	-.02	.04	-.24**	-.13*
Grade 3 Relational Aggression	-.37**	-.15*	-.09	-.003	-.14*	-.01
Grade 3 Cyber Aggression	-.03	-.04	-.10	-.11	-.07	-.10
Grade 4 Overt aggression	-.11	.07	-.20**	.90	-.08	.10
Grade 4 Relational Aggression	-.12	.04	-.18**	.07	-.03	.13*
Grade 4 Cyber Aggression	-.06	-.02	.12	.37	.01	-.02
Grade 5 Overt Aggression	-.15**	-.004	-.06	.13*	-.27**	.04
Grade 5 Relational Aggression	-.19**	.03	-.15**	.07	-.27**	.08
Grade 5 Cyber Aggression	-.21**	-.11	-.07	-.22**	-.29**	-.27**

Note \* =  $p < .05$ , \*\* =  $p < .$

A latent profile analysis was conducted using Mplus 8.4. The estimator MLR was used to account for non-normal data and missingness was considered missing at random. Fit statistics along with theoretical relevance were considered. The fit statistics used to consider model fit were the bootstrapped likelihood ratio test (BLRT), the Akaike Information Criterion (AIC), the Bayes Information Criterion (BIC), entropy, and univariate entropy. The BLRT compares the estimated model to a model with one less profile. A significant value indicates a better fit of the current model. The AIC is a measure of goodness of fit that considers the number of parameters. The BIC compares non-nested models with different numbers of latent classes in order to evaluate model fit, with a lower BIC value indicating a better fit. The BIC also considers the number of parameters and the number of observations. Entropy measures class certainty with values closer to one indicating high certainty and values near zero indicating low certainty. The univariate entropy is made up of calculated individual indicators which are directly comparable to each other. The higher the entropy the more informative the indicator is in estimating classes.

Model fit criteria for four latent profiles are shown in Table 4. Analysis of the model fit criteria and theoretical consideration indicated that a three-profile model was the best fit. The three-profile model resulted in a lower BIC (1981.85) and AIC (1930.77) than the two-profile model (BIC 2116.80, AIC 2080.03). According to the BLRT, the three-class model was significantly different from the two-profile model. The four-profile model was not considered due to only having one member in its fourth profile. Furthermore, in line with theoretical assumptions, the three-profile model three distinctly different aggression profiles both in terms of rate of usage and aggression type.



Table 4

Fit statistics for LPA

Class	AIC	BIC	P value LMR	P value BLRT	Entropy	Lowest Class
1	2420.60	2442.66				292
2	2080.03	2116.80	.02	.001	.96	46
3	1930.77	1981.85	.67	.001	.95	36
4	1786.07	1795.17	.06	.001	.96	1

The first latent profile ( $N = 218$ , 74%) was characterized by low levels of all three subtypes of aggression, overt aggression ( $M = -0.34$ ,  $SE = .04$ ), relational aggression ( $M = -0.32$ ,  $SE = .05$ ), and cyber aggression ( $M = -0.24$ ,  $SE = .02$ ). The second latent profile ( $N = 38$ , 12.9%) was characterized by relatively high levels of overt aggression ( $M = 1.80$ ,  $SE = .28$ ) and relational aggression ( $M = 1.81$ ,  $SE = 0.22$ ), but a low level of cyber aggression ( $M = -0.14$ ,  $SE = 0.11$ ). The third class ( $N = 36$ , 13.1%) was characterized by lower levels of overt aggression ( $M = -0.13$ ,  $SE = 0.13$ ) and relational aggression ( $M = -0.16$ ,  $SE = 0.13$ ), but the highest levels of cyber aggression ( $M = 2.62$ ,  $SE = 0.21$ ). A graph of the latent profiles can be found in figure 1.

Unsurprisingly, the results revealed a large group of children who are not aggressive. However, results also revealed a group that chose to use both overt and relational aggression. Confirming previous research that has indicated that children who choose to use overt aggression also tend to use relational aggression (Little, et al., 2003). Lastly, the results indicated that children who participate in cyber aggression do not typically use the more traditional means of aggression. This may indicate that children are using aggression for different reasons

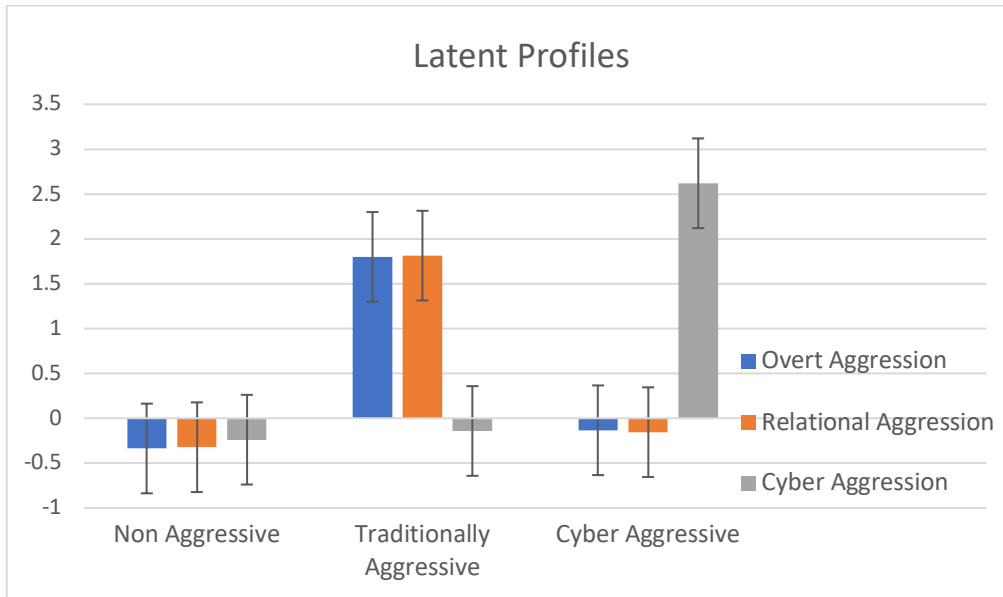


Figure 1. Graph of latent profiles with 95% confidence interval error bars.

The R3STEP command in Mplus was used to explore the potential impact that gender may have had on profile formation. The R3STEP conducts a series of multinomial that are used to determine whether being a boy or girl would result in a higher probability of being in one profile group over another. Results indicated that girls were more likely to be in the non-aggressive group than boys and boys were more likely to be in the traditionally aggressive group than girls. Gender was not significantly associated with the cyber aggressive group.

An intercept, linear, and quadratic model were compared to determine the best fit to model the rate of growth for peer popularity and peer liking in school aged children’s third and fourth grade year. Two growth models (one for peer liking and one for peer popularity) were analyzed simultaneously for each model type. The estimator MLR was used to account for non-normal data and missingness was considered missing at random. A model chi-square and degrees of freedom, Steiger-Lind root mean square error of approximation (RMSEA; Steiger, 1990), Bentler comparative fit index (CFI; Bentler, 1990), and standardized root mean square residual

(SRMR) were the indices used to evaluate model fit. The Model chi-square tests the null hypothesis that the model is correct. The model chi square is sensitive to sample size and assumes a perfect fit of the model. The model chi square is a badness of fit test. RMSEA reflects the lack of fit of the researcher's model to the population covariance matrix per degrees of freedom. A RMSEA of  $\leq .05$  indicates a close approximate fit. Values between .05 and .08 suggest reasonable error of approximation. An RMSEA of  $\geq .10$  suggests poor fit (Brown & Cudeck, 1993). The Comparative Fit Index (CFI) range from 0 to 1 with higher values indicating better fit. CFI values greater than roughly .90 indicates a marginal fit of the researcher's model (Hu & Bentler, 1999), and values  $\geq 0.95$  indicate an excellent fit. The CFI compares the fit of the target model to the fit of an independent model that assumes all variables to be uncorrelated. The CFI represents the extent to which the target model is better than the independent model. The SRMR is a measure of the mean of absolute correlation residual and the overall difference between the observed and predicted correlations. Values of the SRMR less than .10 are generally considered a good fit (Hu & Bentler, 1999). Fit statistics from each model can be found in Table 5.

Table 5. Fit statistics for growth models.

<b>Model</b>	<b>AIC</b>	<b>BIC</b>	<b>X2(df)</b>	<b>RMSEA (90% CI)</b>	<b>CFI</b>	<b>SRMR</b>
Intercept	4210.94	4251.39	70.97 (16)	.11 (0.08 – 0.14)	.92	.05
Linear	4171.49	4245.02	0.03 (7)	0.07 (0.02. – 0.11)	.99	.02
Quadratic	4168.31	4267.58	0.00	0.00 (0.00 – 0.00)	1	.00

Analysis of the fit statistics identified a linear growth model as the best model fit. The conceptual model can be found in Figure 2 and 3.

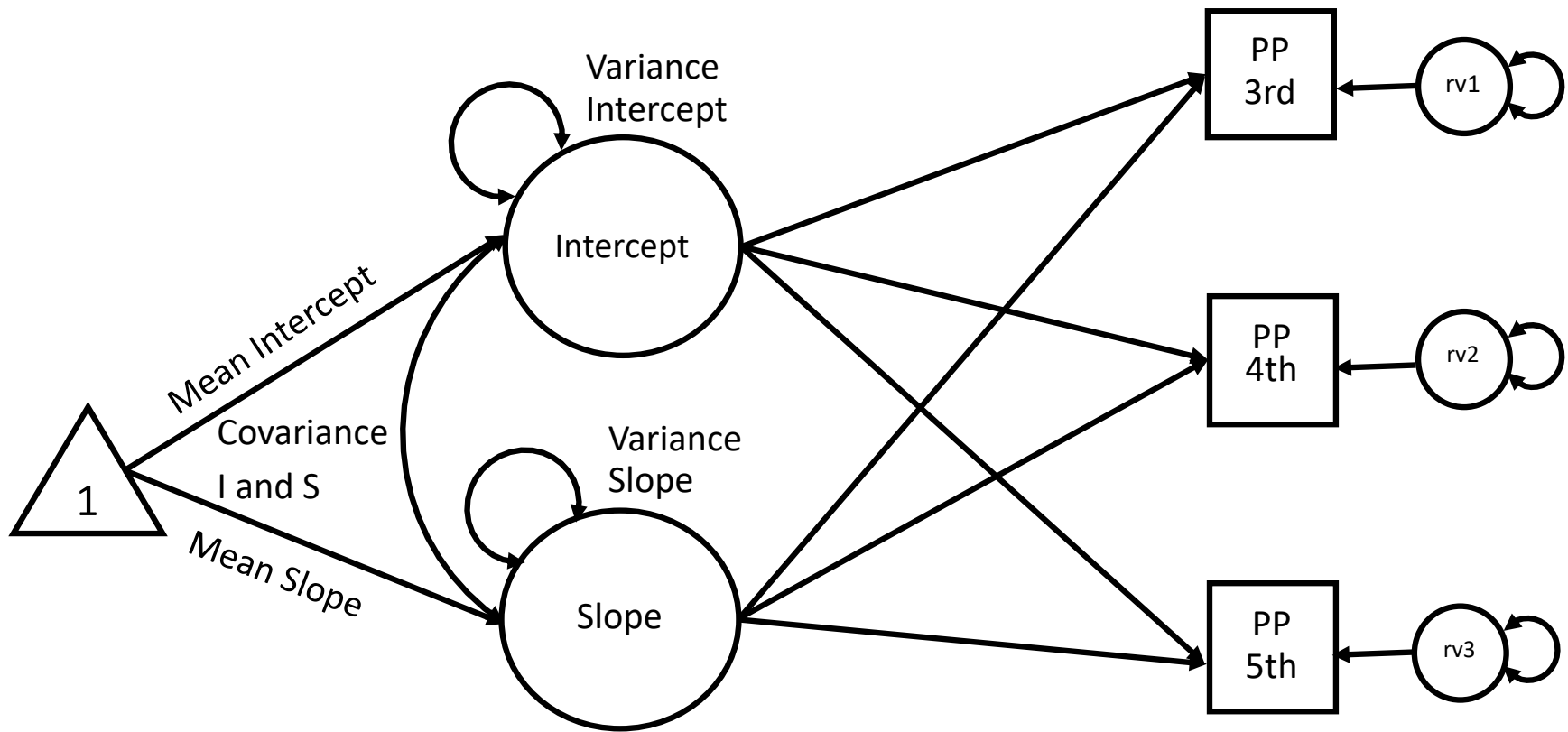


Figure 2. Peer popularity growth curve model conceptual model. Note. PP = Peer Popularity, RV = Residual Variance

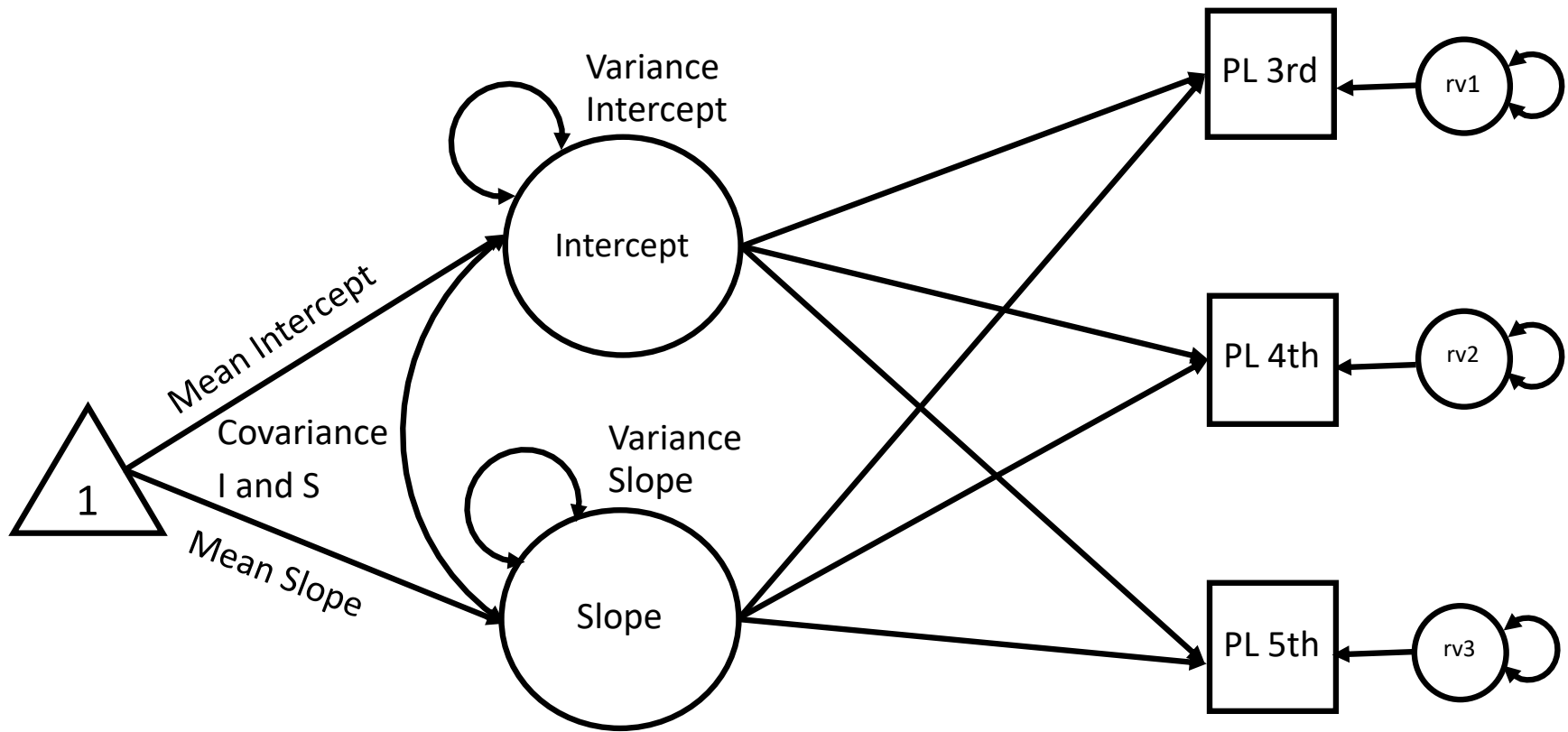


Figure 3. Peer liking growth curve conceptual model. Note. PL = Peer Liking, RV = Residual Variance

Results from the linear growth model revealed a negative covariance between the peer popularity slope and intercept (est. = -1.36,  $p = 0.07$ ) indicating higher initial levels of peer popularity led to slower rates of growth. The covariance between the peer liking slope and intercept was also negative (est. = -3.21,  $p = 0.001$ ). Indicating higher levels of peer liking was related to slower rates of growth for peer liking levels. The mean intercept for peer popularity was statistically significant ( $M_i = 4.86$ ,  $p < 0.01$ ). The rate of change was not statistically different from zero ( $M_s = 0.10$ ,  $p = 0.47$ ). The variances for both the peer popularity intercept (est. = 7.01,  $p < 0.01$ ) and peer popularity slope (est. = 3.81,  $p < 0.001$ ) were statistically significant. Indicating individual differences for the initial level of peer popularity and the rate of change over time.

Unlike peer popularity, the covariance between the peer liking intercept and slope was significant ( $\sigma = -3.21$ ,  $p = 0.001$ ), with higher levels of peer liking led to slower rates of growth for peer liking. The mean intercept for peer liking was statistically significant ( $M_i = 6.99$ ,  $p < 0.01$ ) indicating that the average change was significantly different than zero. The mean slope for peer liking was also statistically significant ( $M_s = -0.74$ ,  $p < 0.01$ ). Initial levels of peer liking were 6.99 and reduced an average of -0.74 annually. The variances for both the peer liking intercept ( $\sigma^2 = 8.08$ ,  $p < 0.01$ ) and slope were also statistically significant. Indicating individual differences for the initial level of peer liking and the rate of change over time.

Finally, two growth models (peer liking and peer popularity) were estimated for each class taking into account uncertainty in class membership by using BCH weights. For the low aggression model, the intercept mean ( $M_i = 7.43$ ,  $p < 0.01$ ) and slope mean ( $M_s = -0.77$ ,  $p < 0.01$ ) were both statistically significant for peer popularity. The peer liking intercept ( $M_i = 0.12$ ,  $p < 0.01$ ) and slope ( $M_s = 0.01$ ,  $p < 0.01$ ) means were not significant. Indicating that the initial

level of peer liking and the rate of change over time were not statistically different from zero. For the traditionally aggressive group, the intercept mean ( $Mi = 5.06, p < 0.01$ ) and slope mean ( $Ms = -0.73, p = 0.02$ ) were both statistically significant for peer popularity. The peer liking intercept mean ( $Mi = -0.41, p = 0.01$ ) was statistically significant. However, the peer liking slope mean ( $Ms = -0.06, p = 0.46$ ) was not significant. Indicating that the traditionally aggressive group, rate of change in peer liking over the fourth and fifth grade was not statistically different from zero. For the cyber aggressive group, the intercept mean ( $Mi = 6.50, p < 0.01$ ) and slope mean ( $Ms = -0.71, p = 0.03$ ) were both statistically significant for peer popularity. The intercept ( $Mi = 0.01, p = 0.93$ ) and slope means ( $Ms = -0.05, p = 0.27$ ) for peer liking were not statistically significant.

To account for the significant impact of gender on class membership, two additional growth models (peer liking and peer popularity) were estimated for each class taking into account uncertainty in class membership by using BCH weights and adding gender as a covariate. The latent class slopes in this growth model were predicted by the intercept to determine if classes differ in slope across classes. For the low aggression profile, boys had an annual significant decrease in peer popularity ratings ( $est = -0.82, p = .02$ ) when compared to girls. Boys also had an annual increase of peer liking significantly higher than girls ( $est. = .05, p = 0.008$ ). For the traditionally aggressive group, boys had an annual decrease in peer popularity rankings significantly lower than girls ( $est = -0.16, p = 0.005$ ). Boys also had annual increase in peer liking significantly higher than girls ( $est = 0.04, p < 0.01$ ). For the cyber aggression group, the annual change in peer popularity was not significantly different between boys and girls. However, boys had an annual increase in peer liking that was significantly higher than girls ( $est. = 0.05, p = .001$ ). Statistics for the growth curve model with gender as a covariate can be found in table 6.

Table 6

Growth curve model with gender statistics

	Non-Aggressive Group			Traditionally Aggressive Group			Cyber Aggressive Group		
	Estimate	S.E.	<i>p</i> -Value	Estimate	S.E.	<i>p</i> -Value	Estimate	S.E.	<i>p</i> -Value
<b>Sample Coefficients</b>									
PP Intercept on Gender	0.67	0.06	0.001	0.75	0.06	.001	0.88	0.06	.001
PL Intercept on Gender	0.11	0.01	0.001	0.11	0.02	.001	0.14	0.02	.001
PP Slope on Gender	-0.31	0.04	0.001	-0.38	0.04	.001	-0.36	0.04	.001
PL Slope on Gender	-0.01	0.01	.31	-0.01	0.01	.51	-0.01	0.01	.25
<b>Covariances</b>									
PP Slope with Intercept	-1.14	0.71	0.11	-1.14	0.71	.11	-1.14	0.71	0.11
PL Slope with Intercept	0.37	0.06	0.001	0.37	0.06	.001	0.37	0.06	.001
<b>Intercept</b>									
PP Intercept	4.12	0.37	.001	3.08	0.32	.001	2.46	0.32	.001
PL Intercept	-0.39	0.11	.001	-0.46	0.10	.001	-0.95	0.09	.001
PP Slope	0.57	0.25	.03	1.68	0.26	.001	0.36	0.21	.09
PL Slope	-0.04	0.06	.54	0.16	0.06	.003	0.04	0.03	0.28
<b>Residual Variances</b>									
3 <sup>rd</sup> Grade PP	4.62	1.34	.001	4.62	1.34	.001	4.62	1.34	.001
4 <sup>th</sup> Grade PP	10.30	0.86	.001	10.30	0.86	.001	10.30	0.86	.001
5 <sup>th</sup> Grade PP	3.17	0.90	.001	3.17	0.90	.001	3.17	0.90	.001
3 <sup>rd</sup> Grade PL	1.09	0.12	.001	1.09	0.12	.001	1.09	0.12	.001
4 <sup>th</sup> Grade PL	0.38	0.05	.001	0.38	0.05	.001	0.38	0.05	.001
5 <sup>th</sup> Grade PL	0.83	0.14	.001	0.83	0.14	.001	0.83	0.14	.001
PP Intercept	2.95	1.24	.02	3.14	1.26	0.01	2.75	1.23	.03
PP Slope	2.19	0.52	.001	2.35	0.52	.001	1.93	0.51	.001
PL Intercept	-0.14	0.08	0.06	-0.14	0.08	.001	-0.12	0.08	.10
PL Slope	-0.31	0.06	.001	-0.31	0.06	.001	-0.34	0.06	.001



A line graph for the peer popularity intercept and slope can be found in figure 4 and a line graph for the peer liking intercept and slope can be found in figure 5.

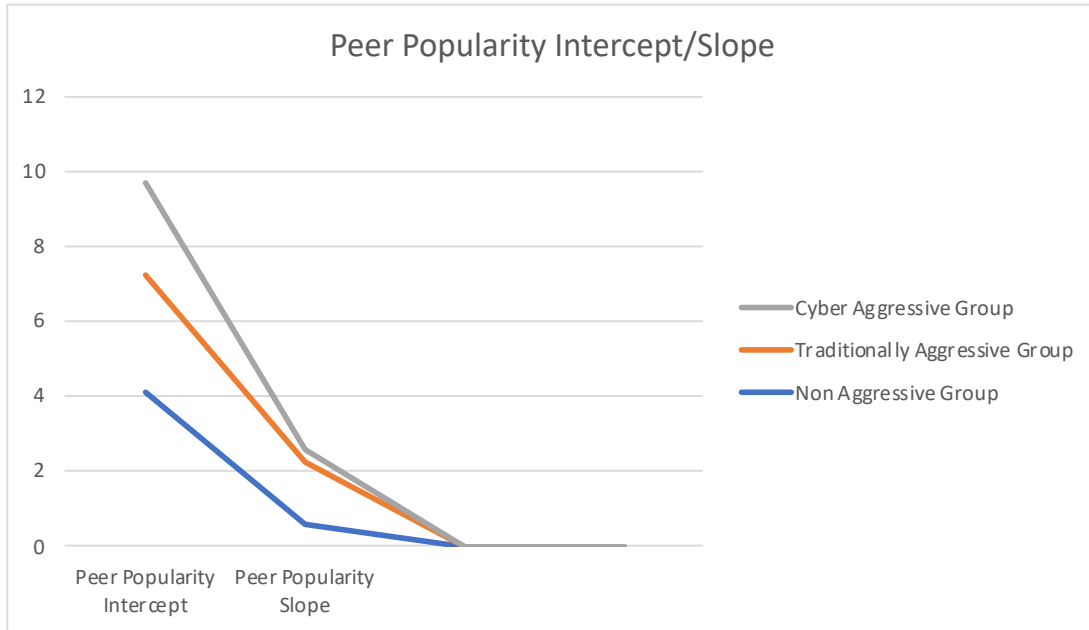


Figure 4. Peer Popularity Intercept and Slope

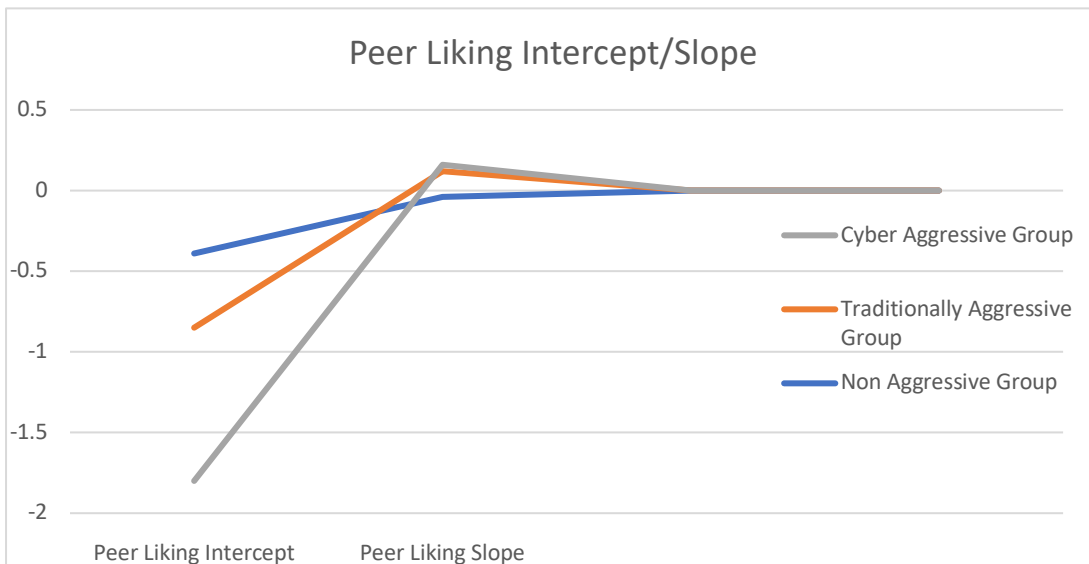


Figure 5. Peer Liking Intercept and Slope

A model constraint was conducted to explore potential mean differences in slope by calculating differences in parameters in the initial levels and rates of change of peer popularity and peer liking levels in fourth and fifth grade for the nonaggressive, traditionally aggressive, and cyber aggressive profiles. All parameters with estimates, standard errors, and *p* values can be found below in Table 7.

Table 7

Model constraint comparisons for all parameters.

Parameters	Estimate	Standard Error	<i>p</i> -Value
Nonaggressive/ Traditionally Aggressive Peer Popularity Intercept	0.07	0.12	0.55
Nonaggressive/Traditionally Aggressive Peer Popularity Slope	-0.88	0.33	.01
Nonaggressive/Traditionally Aggressive Peer Liking Intercept	-0.04	0.03	.11
Nonaggressive/Traditionally Aggressive Peer Liking Slope	-0.47	0.10	0.01
Nonaggressive/Cyber Aggressive Peer Popularity Intercept	0.07	0.12	0.57
Nonaggressive/Cyber Aggressive Peer Popularity Slope	-1.25	0.49	.01
Nonaggressive/Cyber Aggressive Peer Liking Intercept	0.04	0.03	0.15
Nonaggressive/Cyber Aggressive Peer Liking Slope	-0.23	0.11	.04
Traditionally Aggressive/Cyber Aggressive Peer Popularity Intercept	0.01	0.15	0.99
Traditionally Aggressive/Cyber Aggressive Peer Popularity Slope	-0.37	0.46	0.43
Traditionally Aggressive/Cyber Aggressive Peer Liking Intercept	0.08	0.03	0.003
Traditionally Aggressive/Cyber Aggressive Peer Liking Slope	0.24	0.08	0.004

Analysis identified five significant differences, related to slope, between the three profiles. There was a significant mean difference for the peer popularity and peer liking slope for the nonaggressive and traditionally aggressive profiles (est. = -0.88,  $P < 0.01$ ) and (est. = -0.47,  $P = 0.001$ ). Indicating that the nonaggressive group had a faster rate of negative change when compared to the traditionally aggressive group. There was also a significant mean difference between the nonaggressive and cyber aggressive profiles for peer liking and peer popularity (est. = -1.25,  $P < 0.01$ ) and (est. = -0.23,  $P < 0.01$ ). Again, indicating that the nonaggressive group had a statistically significant faster rate of negative change of peer liking and popularity ratings. There was also a statistically significant difference in the peer liking slope for the traditionally

aggressive and cyber aggressive profiles (est. = 0.23,  $p < 0.001$ ) indicating that the traditionally aggressive group had a faster rate of positive change for peer liking ratings than the cyber aggressive group. No other significant parameter differences were identified.

### **Discussion**

The association between traditional aggression (here, as overt and relational aggression) and peer social standing (here, as liking and popularity) has captured the attention of researchers for many years. Although aggression, particularly overt aggression, has been associated with negative consequences such as peer rejection and loneliness, research has shown that a subset of children may use aggression as a tool to increase social status. Recently, the use of cyber aggression has been examined in relation to peer social competence. The present research contributes to the literature on aggression and peer social standing by using a person-centered approach to explore the association between overt, relational, and cyber aggression and social standing (peer popularity and peer liking). We used a latent profile analysis to create distinct profiles groups based on third grade levels of aggression (overt, relational, and cyber). These profiles were then used in a growth curve model to explore the potential rate of change in children's fourth and fifth grade peer popularity and peer liking nominations.

Results, from the LPA identified three distinct groups of children. The most populous group of children was those with minimal aggression scores. This is not surprising as most children are not considered to be aggressive in the classroom setting. However, the other two profiles revealed children who chose to be aggressive in distinctly different ways. One group of children was found to be aggressive in the more traditional face to face manner and were (relatively) high in both overt and relational aggression. The third group, which was comparable in size to the second, used technology as a means to be aggressive towards peers and were low in

overt and relational aggression, and high in cyber aggression. These results may indicate that cyber aggression should be considered as an independent construct rather than a simple extension of traditional aggression.

Results from the growth curve model revealed different trajectories in the association of aggression and social standing based on third grade aggression levels. The non-aggressive group appeared to have the greatest decrease over time when compared to the other two profile groups. However, this result is somewhat misleading due to the fact that the non-aggressive group had a significantly higher social standing in comparison to the other two groups. Furthermore, although the non-aggressive group had the highest decrease in social standing, this group still enjoyed a higher social standing. This may imply that this group utilized more effective strategies to maintain their social standing over time. Indicating that other factors besides aggression play a more prominent role in a child's social standing. However, when children are aggressive, present results indicate that the form of aggression used may impact a child's social standing in significantly different ways.

As previously stated, it is known that there is an association of children who participate in more traditional means of aggression and their social status in the classroom. Past research suggests that, although these children sacrifice likeability by peers, they improve their peer popularity (Cillessen & Mayeux, 2004; Kuryluk, Cohen, & Audley-Piotrowski, 2011) and therefore one assessment of their social standing. This is supported by the findings of the present research which indicated that children who were traditionally aggressive had a higher rate of change in peer popularity than children who were not aggressive. However, children who were aggressive through the use of technology did not appear to enjoy the same benefits or boosts to their social standing. Results indicated that children who were primarily cyber aggressive had

lower initial rates of peer liking and peer popularity ratings when compared to children who used more traditional means of aggression. Furthermore, results indicated that children who participate primarily in cyber aggression do not experience a higher rate of change in peer liking over time when compared to traditionally aggressive children. In short, children who participate in traditional aggression appear to have a higher social standing than children who primarily participate in cyber aggression.

It is unclear why children engage in acts of aggression and not particularly well understood what function these aggressive acts serve. The context in which these aggressive acts are committed must also be considered. It is plausible that children are aggressive in different ways for perhaps different reasons. It may be that children who use technology to be aggressive are not able or willing to use more traditional means of aggression. Cyber aggression may be an avenue for the child who typically lacks the social status or power differential to be aggressive in a safe space without fear of retaliation. Although research has indicated that most children may know the identity of cyber aggressors (Tokuna, 2010), children may be more compelled to be aggressive in what they feel is a safe distance away from their victim, adulting monitoring, and a more anonymous manner. Therefore, it may be possible that children who use cyber aggression are doing so for very different reasons than children who use traditional aggression. Further research is needed to explore both the forms and functions of aggression and their association to peer standing over time.

The association of gender to membership the profile groups was expected based on previous literature. Research consistently has shown that boys commit overt aggression at higher rates than girls. Much previous research also has indicated that boys commit relational aggression at rates that are comparable to girls. Therefore, it is not surprising that boys were

more likely to be assigned to the aggressive group. The present research failed to find a significant association between gender and those primarily assigned to the cyber aggressive group. This result has mixed support in the literature. Tokunaga (2010) found that boys commit cyber aggression at higher rates than girls. However, Washington et. al., (2018) found that boys and girls engaged in cyber aggression at similar rates. The differences in the association of gender to cyber aggression may be due to differences in methodology. Further research is needed to explore the longitudinal association of gender to aggression and peer social standing.

In sum, findings clearly show a longitudinal association between forms of aggression to peer liking and popularity. It is also clear that this association is negative in nature. Furthermore, results indicate that this association may weaken over time. This may provide evidence that aggression is not as impactful on social standing over time. It is commonly known that use of aggression becomes even more taboo as children age. This may enable children to devise different ways to impact their social standing.

Although the present research was conceptualized through a developmental lens, potential clinical implications should be considered. Previous research has found that classroom climate has a profound effect on the development of aggression. Classrooms that are more aggressive collectively tend to increase the aggression rates of those students over time. Considering the importance that classroom climate plays in the development of aggressive behaviors, the classroom, quite naturally, should be considered an important arena for the potential development of prevention and intervention models providing a unique atmosphere in which policy and structure can have a lasting impact. Teachers are in a unique position in the classroom and have the ability to impact the trajectory of a child's expression of aggression. They are important agents not only to mitigate peer conflict and aggression, but to also provide

children with alternatives to enhance their social standing by increasing their use of prosocial behaviors.

Also, considering the increasingly high usage of the internet by elementary-aged children, more attention should be devoted towards the online activity of children in the classroom. Increasing the usage of technology in the classroom can give teachers the opportunity to address cyber aggression in the classroom setting. Teachers can teach digitized citizenship and openly discuss the impact that aggression can have over time. Policies that have been shown to be improve classroom climate can be transferred to the digital spaces that children use daily. Teachers can also work collaboratively with parents to ensure proper monitoring of children's online activity. These collaborative conversations can even be incorporated into the typically scheduled parent teacher conferences. With the hope that these conversations can help teachers and parents gain better insight into the motives of cyber aggression and provide the opportunity to develop strategic and individually tailored interventions.

### **Limitations and Future Consideration**

The present research explored the impact of gender on class membership for the latent profile analysis as well as the slope and intercept for the growth curve model with varying results. As previously mentioned, gender predicted class membership for both the nonaggressive and traditionally aggressive class. Gender also predicted the slope or rate of change for peer liking. However, the present study did not explore the potential impact of classroom differences in the formation of aggression class membership or the growth curve model. Previous research suggests that classroom climate may influence aggressive behavior (Thomas, Bierman, & Powers, 2011). Therefore, it is possible that particular classrooms are higher in certain subtypes of aggression than other classes. Previous research has also found that classroom climate affects

the way that aggression is associated with popularity (Laninga-Wijnen, Harakeh, Dijkstra, Veenstra, & Vollebergh, 2020). Clearly, the potential impact of classroom climate may impact the trajectory of aggressive behaviors and subsequently future social status. Future studies should consider using individual classrooms as predictors (LPA) and covariates (growth curve models).

The present research only considered the impact of aggression on peer liking and peer popularity over time. Future research should expand on this foundation and consider how subtypes of aggression impact other indices of social competence (e.g., loneliness, peer rejection) over time. Subtypes of aggression may have varying effects on other indices over time. Exploring a wider set of dependent variables can possibly paint a clearer picture in terms of the impact that subtypes of aggression have on social standing and a child's overall development in that area.

The current study used a sample of predominantly middle-class students. Therefore, the results may have limited generalizability. Previous research has shown that schools located in lower SES neighborhoods have higher reported rates of aggression. Future research should be expanded on this topic to include a more diverse and representative sample. The present research focused on the association between subtypes of aggression and social status. However, children become aggressive for a number of reasons and a child's specific motivation for becoming aggressive was not explored. A study of a more qualitative nature may be better suited to investigate the motivation behind children's aggressive acts. Furthermore, qualitative studies may provide a better understanding of what makes children who are cyber aggressive different from children who choose to use more traditional aggression tactics.



## **Conclusions**

The current study was designed to explore the association between profiles of aggression group membership and peer social standing over time using an LPA and Growth Curve Model. Results of the LPA revealed three distinct profiles based on expression of forms of aggression: non aggression, traditional (overt and relational aggression), and cyber aggression. Results from the LPA also revealed a group of children who engaged primarily in cyber aggression. Results from the Growth Curve Model indicate that children who were traditionally aggressive had a better social standing initially and over time when compared to children who chose to predominately use cyber aggression. These results bring into question the specific function of the different forms of aggression and the context that these aggressive acts are committed. The results also highlight individual differences in the association between aggression and social standing over time. This association is not based on one simple formula, but rather a combination of individual factors. Furthermore, results indicate a clear path to prevention and intervention aimed improving the climate and quality of social engagement through technology. Further research can build on the present study by reconceptualizing the inclusion of gender and exploring the impact of SES and classroom level variables in the association between aggression and peer standing.

## References

- Adler, P. A., Adler, P., & Adler, P. (1998). *Peer power: preadolescent culture and identity*. Rutgers University Press: New Brunswick, NJ.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*, 238-246.
- Berne, S., Frisé, A., Schultze-Krumbholz, A., Scheithauer, H., Naruskov, K., Luik, P., & Zukauskienė, R. (2013). Cyberbullying assessment instruments: A systematic review. *Aggression and Violent Behavior*, *18*, 320-334.
- Björkqvist, K. (2018). Gender differences in aggression. *Current Opinion in Psychology*, *19*, 39-42.
- Bost, K. K., Vaughn, B. E., Washington, W. N., Cielinski, K. L., & Bradbard, M. R. (1998). Social competence, social support, and attachment: Demarcation of construct domains, measurement, and paths of influence for preschool children attending head start. *Child Development*, *69*, 192-218.
- Brain, P. F. (1994). Hormonal aspects of aggression and violence. In A. J. Reis Jr. & J. A. Roth (Eds.). *Understanding and control of biobehavioral influences on violence* (Vol. 2, pp. 177-244). Washington, DC: National Academy Press.
- Casper, D. M., & Card, N. A. (2017). Overt and relational victimization: A meta-analytic review of their overlap and associations with social-psychological adjustment. *Child Development*, *88*, 466-483.
- Cillessen, A. H., & Mayeux, L. (2004). From censure to reinforcement: Developmental changes in the association between aggression and social status. *Child Development*, *75*, 147-163.
- Cillessen, A. H., & Rose, A. J. (2005). Understanding popularity in the peer system. *Current Directions in Psychological Science*, *14*, 102-105.
- Coie, J. D. (1998). Aggression and antisocial behavior. *Social, Emotional, and Personality Development*, 779-862.
- Coie, J. D., Dodge, K. A., & Coppotelli, H. (1982). Dimensions and types of social status: A cross-age perspective. *Developmental Psychology*, *18*, 557-570.
- Crick, N.R., Ostrov, J.M., & Awabata, Y. (2007). Relational aggression and gender: An overview. In D.J. Flannery, A.T. Vazsonyi, and I.D. Waldman (Eds.), *Cambridge handbook of violent behavior and aggression* (pp. 245-259). New York, New York: Cambridge University Press.

- Dodge, K. A., Coie, J.D. and Lynam, D. (2006). Aggression and antisocial behavior in youth. In W. Damon (Series Ed.) and N. Eisenberg (Vol. Ed.), *Handbook of Child Psychology*; Vol. 3. Social, emotional, and personality development (pp. 719-788). Hoboken, NJ: Wiley.
- Crick, N. R., Ostrov, J. M., & Werner, N. E. (2006). A longitudinal study of relational aggression, physical aggression, and children's social-psychological adjustment. *Journal of Abnormal Child Psychology*, *34*, 127-138.
- Englander, E. K., & Muldowney, A. M. (2007). Just Turn the Darn Thing Off: Understanding Cyberbullying. In *Proceedings of persistently safe schools: The 2007 National Conference on Safe Schools*.
- Fagot, B. I., Leinbach, M. D., & Hagan, R. (1986). Gender labeling and the adoption of sex-typed behaviors. *Developmental Psychology*, *22*, 440-443.
- Harré, R., & Lamb, R. (1983). *The encyclopedic dictionary of psychology*. The MIT Press.
- Hawley, P. H. (2003). Strategies of control, aggression, and morality in preschoolers: An evolutionary perspective. *Journal of Experimental Child Psychology*, *85*, 213-235.
- Hawley, P. H., Little, T. D., & Card, N. A. (2008). The myth of the alpha male: A new look at dominance-related beliefs and behaviors among adolescent males and females. *International Journal of Behavioral Development*, *32*, 76-88.
- Hektner, J. M., August, G. J., & Realmuto, G. M. (2000). Patterns and temporal changes in peer affiliation among aggressive and nonaggressive children participating in a summer school program. *Journal of Clinical Child Psychology*, *29*, 603-614.
- Hinduja, S., & Patchin, J. W. (2008). Cyberbullying: An exploratory analysis of factors related to offending and victimization. *Deviant Behavior*, *29*, 129-156.
- Holt, M. K., & Keyes, M. A. (2004). Teachers' attitudes toward bullying. In D. L. Espelage & S. M. Swearer (Eds.), *Bullying in American schools: A social-ecological perspective on prevention and intervention* (pp. 121-139). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*, 1-55.
- Kashani, J. H., Suarez, L., Allan, W. D., & Reid, J. C. (1997). Hopelessness in inpatient youths: A closer look at behavior, emotional expression, and social support. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*, 1625-1631.

- Kuryluk, A., Cohen, R., & Audley-Piotrowski, S. (2011). The role of respect in the relation of aggression to popularity. *Social Development, 20*, 703-717.
- Labella, M. H., & Masten, A. S. (2018). Family influences on the development of aggression and violence. *Current opinion in psychology, 19*, 11-16.
- Ladd, G. W., & Price, J. M. (1987). Predicting children's social and school adjustment following the transition from preschool to kindergarten. *Child Development, 58*, 1168-1189.
- LaFontana, K. M., & Cillessen, A. H. (2002). Children's perceptions of popular and unpopular peers: A multimethod assessment. *Developmental Psychology, 38*, 635-647.
- Laninga-Wijnen, L., Harakeh, Z., Dijkstra, Jan K., Veenstra, R., & Vollebergh, W. (2020). Who sets the aggressive popularity norm in classrooms? It's the number and strength of aggressive, prosocial, and bi-strategic adolescents. *Journal of Abnormal Child Psychology, 48*, 13–27.
- Lease, A. M., Kennedy, C. A., & Axelrod, J. L. (2002). Children's social constructions of popularity. *Social Development, 11*, 87-109.
- Little, T. D., Brauner, J., Jones, S. M., Nock, M. K., & Hawley, P. H. (2003). Rethinking Aggression: A Typological Examination of the Functions of Aggression. *Merrill-Palmer Quarterly, 49*, 343-369.
- Macoby EE. 1998. *The Two Sexes: Growing Up Apart, Coming Together*. Cambridge, MA: Harvard University Press.
- Malonda, E., Llorca, A., Mesurado, B., Samper, P., & Mestre, M. V. (2019). Parents or peers? Predictors of prosocial behavior and aggression: a longitudinal study. *Frontiers in psychology, 10*, 2379.
- Martin, C. L., & Fabes, R. A. (2001). The stability and consequences of young children's same-sex peer interactions. *Developmental Psychology, 37*, 431- 446.
- Masten, A. S., Morison, P., & Pellegrini, D. S. (1985). A revised class play method of peer assessment. *Developmental Psychology, 21*, 523- 533.
- Mathieson, L. C., Murray-Close, D., Crick, N. R., Woods, K. E., Zimmer-Gembeck, M., Geiger, T. C., & Morales, J. R. (2011). Hostile intent attributions and relational aggression: The moderating roles of emotional sensitivity, gender, and victimization. *Journal of Abnormal Child Psychology, 39*, 977-987.
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus user's guide* (7th ed). Los Angeles, CA: Muthén & Muthén.

- Ojanen, T., Grönroos, M., & Salmivalli, C. (2005). An interpersonal circumplex model of children's social goals: Links with peer-reported behavior and sociometric status. *Developmental Psychology, 41*, 699-710.
- Olweus, D. (1987). Schoolyard bullying: Grounds for intervention. *School Safety, 6*, 4-11.
- Porsch, R. M., Middeldorp, C. M., Cherny, S. S., Krapohl, E., Van Beijsterveldt, C. E., Loukola, A., & Bartels, M. (2016). Longitudinal heritability of childhood aggression. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics, 171*, 697-707.
- Tokunaga, R. S. (2010). Following you home from school: A critical review and synthesis of research on cyberbullying victimization. *Computers in Human Behavior, 26*, 277-287.
- Rodkin, P. C., Farmer, T. W., Pearl, R., & Van Acker, R. (2000). Heterogeneity of popular boys: Antisocial and prosocial configurations. *Developmental Psychology, 36*, 14-24.
- Romero-Abrio, A., Martínez-Ferrer, B., Sánchez-Sosa, J. C., & Musitu, G. (2019). A psychosocial analysis of relational aggression in Mexican adolescents based on sex and age. *Psicothema, 31*, 88-93.
- Rubin, K. H., Bukowski, W. M., & Parker, J. G. (2006). Peer Interactions, Relationships, and Groups. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: social, emotional, and personality development* (pp. 571-645). Hoboken, NJ, US: John Wiley & Sons Inc.
- Schoffstall, C. L., & Cohen, R. (2011). Cyber aggression: The relation between online offenders and offline social competence. *Social Development, 20*, 587-604.
- Sijtsema, J. J., Veenstra, R., Lindenberg, S., & Salmivalli, C. (2009). Empirical test of bullies' status goals: Assessing direct goals, aggression, and prestige. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression, 35*, 57-67.
- Slonje, R., Smith, P. K., & Frisén, A. (2013). The nature of cyberbullying, and strategies for prevention. *Computers in Human Behavior, 29*, 26-32.
- Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research, 25*, 173-180.
- Sutton, J., Smith, P. K., & Swettenham, J. (1999). Bullying and 'theory of mind': A critique of the 'social skills deficit' view of anti-social behaviour. *Social Development, 8*, 117-127.
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5). Boston, MA: Pearson.

- Thomas, D. E., Bierman, K. L., Powers, C. J., & Conduct Problems Prevention Research Group. (2011). The influence of classroom aggression and classroom climate on aggressive–disruptive behavior. *Child Development, 82*, 751-757.
- Tremblay, R. E., Japel, C., Perusse, D., McDuff, P., Boivin, M., Zoccolillo, M., & Montplaisir, J. (1999). The search for the age of ‘onset ‘of physical aggression: Rousseau and Bandura revisited. *Criminal Behaviour and Mental Health, 9*, 8-23.
- Underwood, M. K. (2002). Sticks and stones and social exclusion: Aggression among girls and boys. In P. K. Smith & C. H. Hart (Eds.), *Blackwell handbook of childhood social development* (pp. 533-548). Oxford, UK: Blackwell Publishing.
- Underwood, M.K. (2003) *Social Aggression among Girls*. New York, New York: Guilford.
- Underwood, M. K., Beron, K. J., & Rosen, L. H. (2009). Continuity and change in social and physical aggression from middle childhood through early adolescence. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression, 35*, 357-375.
- Underwood, M. K., & Coie, J. D. (2004). Future directions and priorities for prevention and intervention. In M. Putallaz & K. L. Bierman (Eds.), *Aggression, antisocial behavior, and violence among girls* (pp. 289-301). New York, NY: The Guilford Press.
- Underwood, M. K., & Rosen, L. H. (2011). *Social Development*. Guilford Press: New York.
- Underwood, M.K., Galen, B. R., and Paquette, J.A., (2001). Hopes rather than fears, admirations rather than hostilities: A response to Archer and Bjorkqvist. *Social Development, 10* 275-280.
- Van den Berg, Y. H., Burk, W. J., & Cillessen, A. H. (2019). The functions of aggression in gaining, maintaining, and losing popularity during adolescence: A multiple-cohort design. *Developmental Psychology, 55*, 2159.
- Washington, R., Cohen, R., Berlin, K. S., Hsueh, Y., & Zhou, Z. (2018). The relation of cyber aggression to peer social competence in the classroom for children in China. *Social Development, 27*, 715-731.
- Ybarra, M. L., & Mitchell, K. J. (2004). Youth engaging in online harassment: Associations with caregiver–child relationships, Internet use, and personal characteristics. *Journal of Adolescence, 27*, 319-336.
- Ybarra, M. L., Diener-West, M., & Leaf, P. J. (2007). Examining the overlap in internet harassment and school bullying: Implications for school intervention. *Journal of Adolescent Health, 41*, 42-50.

Yuan, K. H., & Bentler, P. M. (2000). Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. *Sociological Methodology*, 30, 165-200.