



Published in final edited form as:

*J Youth Adolesc.* 2017 June ; 46(6): 1351–1369. doi:10.1007/s10964-016-0601-4.

## Dimensions of Peer Influences and Their Relationship to Adolescents' Aggression, Other Problem Behaviors and Prosocial Behavior

Albert D. Farrell<sup>a</sup>, Erin L. Thompson<sup>b</sup>, Krista R. Mehari<sup>c</sup>

<sup>a</sup>Department of Psychology, Virginia Commonwealth University, P.O. Box 842018, Richmond, VA 23284-2018

<sup>b</sup>Department of Psychology, Virginia Commonwealth University, P.O. Box 842018, Richmond, VA 23284-2018

<sup>c</sup>Violence Prevention Initiative, The Children's Hospital of Philadelphia, 3535 Market St, Rm. 1464, Philadelphia, PA, 19104

### Abstract

Although peers are a major influence during adolescence, the relative importance of specific mechanisms of peer influence on the development of problem behavior is not well understood. This study investigated five domains of peer influence and their relationships to adolescents' problem and prosocial behaviors. Self-report and teacher ratings were obtained for 1,787 (53% female) urban middle school students. Peer pressure for fighting and friends' delinquent behavior were uniquely associated with aggression, drug use and delinquent behavior. Friends' prosocial behavior was uniquely associated with prosocial behavior. Friends' support for fighting and friends' support for nonviolence were not as clearly related to behavior. Findings were generally consistent across gender. This study highlights the importance of studying multiple aspects of peer influences on adolescents' behavior.

### Keywords

peer influence; aggression; delinquency; prosocial behavior; early adolescence; measurement

---

Correspondence concerning this article should be addressed to Albert D. Farrell, Department of Psychology, Virginia Commonwealth University, P.O. Box 842018, Richmond, VA 23284-2018. afarrell@vcu.edu. Phone: (804) 828-8796. Fax: (804) 827-1511.

#### Authors Contributions

AF conceived of the study, completed the statistical analyses, participated in its design and coordination, and drafting of the manuscript; ET participated in the design and interpretation of the data and drafting of the manuscript; KM participated in the development of the measures and interpretation of the data, and drafting of the manuscript. All authors read and approved the final manuscript.

#### Conflicts of Interest

The authors report no conflicts of interest.

#### Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

#### Informed Consent

Informed consent was obtained from all individual participants included in the study.

## Introduction

Peers are among the most salient influences on an individual's behavior during the transition from childhood to adolescence (e.g., Akers, 1998; Allen, Porter, & McFarland, 2006). Adolescence is a time of identity seeking, with peer interactions becoming more frequent and conformity to parents decreasing over time (Brown, 2004). Individuals are more strongly influenced by peers and friends during adolescence than during any other time in their lifespan (e.g., Brown, 1990; Sumter, Bokhorst, Steinberg, & Westenberg, 2009). The strong influence of peers during adolescence is supported by studies that have found links between peer factors and problem behaviors including aggression, drug use, and delinquent behavior (Lipsey & Derzon, 1998). Peer influences associated with adolescents' problem behavior include association with delinquent peers, peer approval of delinquent behavior, and peer pressure for deviance (McCord, Widom, & Crowell, 2001). Research has shown that youth are particularly susceptible to peer influences when their social status is tenuous (Allen et al., 2006), underscoring the need to investigate peer influences during periods of transition and uncertainty, such as the middle school years.

Although peers may influence behavior in many ways, researchers have tended to focus on a single aspect of peer influence, most often investigating association with delinquent peers. This makes it unclear whether there are distinct dimensions of peer influence, or whether peer influences can be represented by a single dimension. A growing body of research has emphasized the importance of considering multiple aspects of peer influence, such as peer behavior, peer reactions to adolescents' behavior, and peer pressure (e.g., Farrell, Henry, Mays, & Schoeny, 2011). Differentiating among these domains of influence is critical to advancing theory and guiding future research. Studies examining peer influences have tended to focus on their relationships with a single type of problem behavior at a time (e.g., delinquent behaviors), rather than simultaneously investigating relationships with multiple domains of problem behavior (e.g., Meter, Casper, & Card, 2015). Researchers have also tended to focus on peer influences that support problem behavior without considering the potential impact of prosocial influences, such as peer models of prosocial behavior and peer support for nonviolence. Moreover, measures of peer influence do not consistently distinguish between close friends and peers, such that many studies use these terms interchangeably (e.g., Bell & Baron, 2015). As the strength of social influences may be influenced by proximity and frequency of contact (Akers, 1998; Bronfenbrenner, 1979), there is a need to consider the influence of both close friends and more distal peer influences. Throughout this article, we use the term "peer" as an umbrella term for same-age youth to whom an individual is regularly exposed and with whom an individual shares experiences, and the term "friend" to describe a subset of peers to whom an individual is attached and with whom a youth regularly interacts by choice. This study addressed key gaps in the current literature by assessing multiple facets of both deviant and prosocial peer influences and their association with several domains of problem behavior and prosocial behavior.

## Domains of Peer Influence

**Peers' deviant behavior.**—Associating with antisocial peers during early adolescence is a strong predictor of subsequent violent behavior and serious delinquency. Lipsey and Derzon (1998) noted that associating with antisocial peers is a key predictor of delinquency among youth ages 12–14. A recent meta-analysis found that a composite measure of peer relationships (including association with delinquent or deviant peers, gang membership, and peer rejection) predicted a life-course persistent trajectory of offending compared to an adolescent-limited trajectory (Assink et al., 2015). A recent systematic review found that associations with delinquent peers predicted delinquent behavior and violence, although the threshold for risk varied across outcomes (Brumley & Jaffee, 2016). The relative importance of peer associations was highlighted by a study that found friends' behavior to be a stronger predictor of individual behavior than friends' attitudes toward problem behavior (Haynie, 2002). These findings are consistent with social learning theories that state friends' behavior is imitated and reinforced by the peer group (Akers, 1985).

**Peer support for aggressive behavior.**—Adolescents are influenced not only by the behavior of their peers, but also by their perceptions of how their peers will react to their behavior in any given situation. There has been an increasing emphasis on the role of cognition in the development of children's aggressive behavior (Henry et al., 2000), which includes prior knowledge and beliefs that are shaped not only by one's own actions but also by the beliefs and actions of those closest to them (Crick & Dodge, 1994). This is particularly salient during early adolescence, which is characterized as a time of transition when social status is established (Stoltz, Cillessen, van den Berg, & Gommans, 2016). Previous studies have shown that aggression can increase adolescents' social status (Faris & Felmlee, 2011; Sentse, Kretschmer, & Salmivalli, 2015). Moreover, the likelihood of adolescents becoming bystanders, defenders of victims, or reinforcers of aggressive behavior varies based on whether they think their peers will approve of that behavior (Bastiaensens et al., 2015; Sandstrom, Makover, & Bartini, 2013). Despite strong theoretical support for the influence of peers' reactions on behavior, researchers have only recently begun to examine this relationship empirically. For example, Farrell et al. (2010) used a qualitative approach to investigate factors influencing urban African American adolescents' use of effective nonviolent responses in problem situations. They found that perceptions of friends' reactions to fighting promoted adolescents' use of fighting and also served as a barrier to nonviolent responses, as many youth were concerned with peer rejection if they engaged in nonviolent responses. In a more recent qualitative study, over 40% of adolescents in urban middle schools said that they were less likely to use a problem-solving or socio-emotional skill taught by a universal violence prevention program due to fear of peers' negative reactions (Farrell, Mehari, Kramer-Kuhn, Mays, & Sullivan, 2015). This highlights the need to examine the influence not only of peer behavior, but also of peer reactions to adolescents' behavior. The current study evaluated a measure of friends' reactions to fighting and nonviolent behavior that emerged from the qualitative work of Farrell and colleagues (2010) to explore the unique contributions of friends' reaction to fighting and nonviolence on various adolescent problem behaviors.

**Peer pressure.**—Although researchers have operationalized peer pressure differently across studies, a key feature is peers' active encouragement or urging of adolescents to behave in a certain manner (Santor, Messervey, & Kusumakar, 2000). Direct peer pressure has been associated with increases in adolescents' problem behavior, including delinquency and other externalizing problems (Allen et al., 2006; Santor et al., 2000; Sullivan, 2006). For example, Sullivan (2006) found that peer pressure to engage in delinquent acts was the strongest predictor of delinquent behavior in early adolescence compared to family environment and early childhood emotional and behavioral problems. Susceptibility to peer pressure has also been shown to predict problem behavior and substance abuse (Allen et al., 2006). Even broad measures of peer pressure that make no reference to problem behavior (e.g., I often feel pressured to do things I wouldn't normally do) have been strongly related to early adolescents' delinquency and substance use (Santor et al., 2000). Additional research is needed to understand the way in which peer pressure fits within the broader context of other peer influences. It is unclear whether certain forms of peer pressure, such as peer pressure for fighting, are more strongly linked to aggression than to other forms of deviant behavior, such as delinquency and drug use. It is also unclear whether peer pressure predicts adolescents' problem behavior even after taking peers' problem behavior into account, or if the relationship is spurious, such that both peer pressure and adolescents' problem behaviors are somewhat dependent on peers' problem behaviors.

**Peers' prosocial behavior and support for prosocial behavior.**—Although most research has focused on peers' delinquent influences, there is a need to assess peers' prosocial influences as well. This parallels the need to assess adolescents' prosocial behaviors, particularly within the context of violence prevention and successful youth development (e.g., Allison, Edmonds, Wilson, Pope, & Farrell, 2011; Caprara, Kanacri, Zuffiano, Gerbino, & Pastorelli, 2015). Prosocial behavior refers to intentional social behavior to benefit others, such as sharing with, helping, and comforting others (Eisenberg, Fabes, & Spinrad, 2006). The development of prosocial behavior has been linked to a decrease in problem behaviors including aggression (Caprara et al., 2015) and substance use (Coyle, Bramham, Dundon, Moynihan, & Carr, 2016), as well as an increase in positive outcomes, such as academic achievement and self-esteem (Zuffiano et al., 2014). Furthermore, the integration of positive peer relationships within prevention efforts has been shown to divert youth away from problem behaviors (Hawkins, Smith, & Catalano, 2004). Specifically, peers' prosocial behavior has been linked to an increase in an individual's prosocial behavior (Barry & Wentzel, 2006) and a decrease in delinquent attitudes (Carson, 2013). Another study found that peer encouragement of prosocial behavior was negatively associated with adolescent delinquency (Padilla-Walker & Carlo, 2007). However, peers' problem behavior had a stronger impact on adolescent behavior than peer's prosocial influences (Padilla-Walker & Carlo, 2007), highlighting the importance of simultaneously investigating the impact of peer influences that support problem behavior and those that support prosocial behavior. It is possible that adolescents who engage in problem behavior also engage in prosocial behavior, rather than these behaviors simply being two extremes on a continuum. The possibility of co-occurring prosocial and problem behaviors points to the need to understand the different roles that these factors may play in influencing adolescents' behaviors.

## Assessment of Peer Influences

Researchers have used a variety of approaches to measure peer behavior. Although adolescent- reports of their peers' behaviors are most commonly used, more direct measures have also been used, including behavioral observation (e.g., Allen et al., 2006) and social network mapping (e.g., Haynie, 2002). Others have aggregated adolescents' individual behaviors at the classroom level (e.g., Henry et al., 2000), although this can include non-friends who have been shown to be less influential than close friends (Brown, 1990). Critics of using an individual's report of their peers' behavior (an indirect measure) contend that such reports assess personal behavior rather than peers' behavior (Gottfredson & Hirschi, 1990). Supporting this contention, research has shown that respondents tend to assume greater similarity between themselves and their peers than is found with objective measures (Marks & Miller, 1987). In addition, one study found that indirect peer measures represented separate constructs from direct peer measures (Young, Rebellon, Barnes, & Weerman, 2014). In contrast, another study found that adolescents' reports of their friends' behavior were uniquely related to *both* their own behavior and to their friends' self-report (Boman, Stogner, Miller, Griffin, & Krohn, 2012). This suggests that although adolescents' own behaviors play a role in their perceptions of friends' behavior, there is still a direct connection between their perceptions of their friends and their friends' actual behavior. Furthermore, adolescents' perceptions of their friends' behavior have been shown to be a stronger influence than their friends' actual behaviors (Young et al., 2014) and as strong as the impact of self-control on future behavior (Pratt et al., 2010). Although there are limitations of using indirect measures of behavior, these findings highlight the importance of measuring adolescents' perceptions of their peers' behavior.

## Gender Moderation of Peer Influences

Given significant gender differences in socialization and peer relationships in adolescence, it is possible that peer influences differentially affect boys and girls. Although boys and girls have been found to engage in different frequencies of adolescent behaviors (e.g., Card, Stucky, Sawalani, & Little, 2008), there has been limited research investigating whether gender moderates the association between peer influences and adolescent behaviors (Galambos, 2004). Especially as they enter adolescence, boys and girls differ in their experiences of friendships (e.g., Rose & Rudolph, 2006). For example, girls' friendships are usually greater in quantity, involve more empathy, and are more interdependent and relationship-focused than boys (Galambos, 2004). In contrast, boys' friendships tend to focus more on specific activities, such as hobbies and sports (Galambos, 2004; Rose & Rudolph, 2006). These differences could affect the strength of peers' influences on adolescents' development (Moretti & Odgers, 2002) and suggest that research exploring the effects of peer influences on adolescents' behaviors should examine possible moderation by gender.

**Gender moderation of peers' deviant behaviors.**—Prior work has produced inconsistent findings concerning gender moderation of the association between peers' delinquent behavior and adolescents' delinquent behavior. Some researchers have not found gender to moderate the association between friends' aggression and adolescents' aggression (Meter et al., 2015) or the relations between friends' delinquency and adolescents'

delinquent and aggressive behaviors during middle school (Denault & Poulin, 2011; Henry, Guerra, Huesmann, Tolan, VanAcker, & Eron, 2000). Other research has found that gender does moderate the influence of peers' delinquent behavior on adolescents' behaviors. For example, when girls use substances (e.g., cigarettes), they use them within the context of a relationship, such as to gain approval from friends (Tomeo, Field, Berkey, Colditz, & Frazier, 1999). Although there is no consistent pattern in the literature about how peer behaviors might differentially influence boys and girls, one possible hypothesis is that friends may have a greater influence on girls' behaviors when it pertains to relationship building (Rose & Rudolph, 2006).

**Gender moderation of peer pressure.**—According to the Gender Intensification Hypothesis, adolescents exert increased pressures towards their peers to conform to traditional norms of masculinity and femininity during adolescence (Hill & Lynch, 1983; Polce-Lynch, Myers, Kliever, & Kilmartin, 2001). In support of this theory, prior research has pointed to the possibility that social pressures to engage in behaviors consistent with gender norms are stronger for boys than girls (Galambos, 2004). The link between peer pressure to conform and adolescents' delinquent behavior has been found to be stronger for boys than girls (Santor et al., 2000). Additionally, a prior study found resistance to peer pressure differed for boys and girls between the ages of 10 and 18, with girls starting to resist peer pressure earlier and show more resistance to peers than boys, particularly during the peak period of mid-adolescence (Sumter et al., 2009). These findings suggest that girls may be less susceptible to gender normative peer pressure.

**Gender moderation of peers' prosocial influences.**—Little research has examined gender differences in the effects of prosocial peer influences on adolescents' behavior (Underwood & Rosen, 2009), despite prior work indicating that girls engage in more prosocial behavior than boys (Barry & Wentzel, 2006; van Rijsewijk, Dijkstra, Pattiselanno, Steglich, Veenstra, 2016). One study found that peer expectations for prosocial behavior were a significant predictor of adolescent prosocial behavior for both genders (Padilla-Walker & Carlo, 2007). In contrast, it also found peer expectations for prosocial behavior predicted a significant decline problem behavior for boys but not for girls. These findings underscore the notion that prosocial and problem behaviors are separate constructs that can be influenced through different mechanisms. There is a lack of research on possible gender moderation of the influence of peers' prosocial behaviors on adolescent behaviors than peers' actual prosocial behavior. Given previous findings that gender moderates the relation between peers' delinquent behaviors and adolescent behaviors, it is possible that peers' prosocial behaviors may also differentially influence boys and girls.

## Hypotheses

The current study investigated the extent to which there is support for distinct dimensions of peer influence and whether these dimensions are independently associated with adolescent problem behavior. The first aim was to determine the structure of peer influences based on measures of several key dimensions. We hypothesized that support would be found for five distinct factors, including Friends' Delinquent Behavior, Friends' Prosocial Behavior, Friends' Support for Fighting, Friends' Support for Nonviolence, and Peer Pressure for

Fighting, and that these factors would fit the data better than broader factors representing deviant versus prosocial peer influences. We also hypothesized that support would be found for strong measurement invariance such that the structure and measurement parameters of these measures would not differ across gender or grade.

The second aim was to assess the extent to which different peer domains were uniquely related to adolescents' behaviors as assessed by both self-report and teacher ratings. This study explored the unique associations between peer domains and physical aggression, relational aggression, delinquent behavior, substance use, nonviolent intentions, and prosocial behavior. We hypothesized that each of the five peer domains would be uniquely related to each of the six outcome measures. We also hypothesized that peer support for problem behaviors would be more closely related to adolescents' problem behaviors, and that peer support for prosocial behaviors would be more closely related to adolescents' prosocial behaviors.

The third aim was to explore gender differences in peer influences. We hypothesized that peer pressure would be more closely associated with problem behaviors among boys than among girls, given prior research suggesting that girls are more resistant to peer pressure. We hypothesized that that friends' delinquent behavior would be more closely associated with problem behaviors among girls than among boys, given prior research suggesting that girls may engage in delinquent behavior with friends to maintain relationships. No specific hypotheses were formed for gender differences related to influences of friends' support for fighting and nonviolence or of friends' prosocial behaviors, given the scarcity of research in those areas,

## Method

### Setting and Participants

Participants were drawn from seven cohorts of students at three middle schools in an urban public school system in the southeastern United States who participated in a study to assess youth violence prevention efforts. The majority of students in these schools (i.e., 74% to 85%) were eligible for the federal free lunch program. About 210 students were randomly selected from each grade (sixth, seventh, and eighth) at each school in the fall of 2010. During each of the four subsequent years a random sample of new sixth grade students was recruited along with a random sample of seventh and eighth grade students to replace those who left the study. The project used a missing by design approach to reduce participant fatigue and testing effects. Data were collected quarterly, but each participant was randomly assigned to complete only two waves of data per year. Analyses for the present study were based on one randomly sampled wave from each participant, such that there was about the same number of participants from each grade and time of year. The resulting data set provided a basis for making between-subject comparisons to examine differences in the factor structure across grades.

The final sample of 1,787 included 592 sixth grade students, 596 seventh grade students, and 599 eighth grade students. Their mean ages were 11.7 (SD = 0.69), 12.7 (SD = 0.70), and 13.8 (SD = 0.72), for sixth, seventh, and eighth grade students, respectively. The sample was

53% female. Fifteen percent of the sample identified their ethnicity as Hispanic or Latino. The majority (82%) self-identified as Black or African American as the sole category (73%) or as one of several categories (9%). Ten percent, most of whom (91%) had identified themselves as Hispanic or Latino, did not endorse any racial category. Of the remainder, 5% identified themselves as White and 1% as Native American or Alaska Native, with less than 2% in all remaining categories. Single mother household was the most frequently reported family structure (42%), followed by two biological parents (26%), parent and stepparent (20%), relative without a parent (6%), and father without a mother or stepmother (3%).

## Procedures

All study procedures were reviewed and approved by the University's Institutional Review Board. The study was described to potential participants who were given student assent and parental consent forms to review with their parents. Staff followed up with parents via phone and home visits as needed. Students received a \$5 gift card for returning consent forms whether or not they participated. Participants were informed of their rights as research participants, including the option to decline or limit participation at any time, and received a \$10 gift certificate for participating in any portion of the survey. Participants completed self-report measures using a computer-assisted survey. Research assistants administered the measures to small groups of students in the schools during the school years and in students' homes or community locations during the summers. Ratings of each student's behavior were obtained from a core teacher during the three waves collected during the school year.

## Measures of Peer Constructs

**Friends' Behavior Scale.**—This measure was developed to assess friends' delinquent and prosocial behavior. Respondents are first asked how many friends they consider to be close friends to orient them to the task. They are then asked to indicate the proportion of their close friends who have been involved in specific behaviors within the past 3 months using a 5-point scale, ranging from 1 - *None of them* to 5 - *All of them*. Ten items assessing friends' engagement in specific problem behaviors including aggression, substance use, and delinquency were adapted from Things Your Friends Have Done developed by the Conduct Problems Prevention Research Group (2000). Seven items representing prosocial behaviors were based on a review of the literature and include prosocial activities, altruistic prosocial behaviors (e.g., "loaned things to people just to be nice;" Boxer, Tisak, & Goldstein, 2004), and prosocial responses to conflict (e.g., "solved most of their disagreements peacefully").

**Friends' Reaction to Responses to Conflict Situations.**—This measure was developed to assess expectations about how friends would react to the participant's behavior in conflict situations (see Appendix). Six scenarios that describe a problem situation are each followed by two types of possible responses: an aggressive response (e.g., "You started a fight") and a nonviolent response (e.g., "you tried to talk to the person calmly to settle the argument"). Participants are asked how they think their friends would react if they made each response in the specific situation. Choices are ordered categories that reflect varying degrees of support including a positive reaction (i.e., "They would think that I did the right thing"), a neutral reaction (i.e., "They would not care"), and a negative reaction (i.e., "They would think I was a punk"). Participants separately rated friends' reactions to



aggressive and prosocial responses, thus making it possible to assess friends' support for fighting and friends' support for nonviolence. Problem situations were obtained from a study that asked urban adolescents and adults familiar with them (e.g., parents, teachers, and other community members) to identify difficult situations commonly faced by adolescents (Author citation, 2006). Possible responses to 25 situations that emerged as prevalent and difficult were then obtained from interviews with 122 middle school students. The effectiveness of each response was then rated by three groups: (a) 61 adolescents from schools and community centers who were nominated by adults as skilled at problem solving; (b) 27 teachers, community center staff, and family interventionists; and (c) nine researchers. The effective nonviolent responses selected for this measure were those that received high ratings of effectiveness on a 5-point scale, ranging from 1 (*really bad*), 2 (*bad*), 3 (*okay*), 4 (*good*), and 5 (*really good*). The wording of peer reactions was revised based on pilot testing with a sample of middle school students from the same school system.

**Peer Pressure for Fighting.**—This seven-item scale assesses how frequently youth experienced pressure to fight over the past 30 days (see Appendix). It includes items about pressure to fight from both friends (e.g., “A friend wanted you to have their back in a fight”) and the larger peer group (e.g., “Other people tried to get you to start a fight with someone”). Participants rate each item on a 6-point rating scale with the anchors 1 - *Never*, 2 - *1-2 times*, 3 - *3-5 times*, 4 - *6-9 times*, 5 - *10-19 times*, and 6 - *20 or more times*. Situations were based on a study that asked youth and individuals familiar with these youth to identify situations that were relevant and difficult for this population (Author citation, 2006). More specifically, they reflected on situations in which either friends or other peers encouraged a physically aggressive response to a conflict with another adolescent.

## Measures of Problem Behaviors and Prosocial Behavior

**Frequency of Problem Behaviors.**—The Problem Behavior Frequency Scale – Adolescent Report (PBFS-AR; Farrell et al., 2016) was used to assess participants' frequency of engaging in problem behaviors. This self-report measure has separate scales that assess the frequency of physical aggression (5 items), relational aggression (5 items), substance use (8 items), and other delinquent behaviors (4 items). Additional scales not used in this study assessed the frequency of victimization. Adolescents rate how frequently each item occurred in the past 30 days on a 6-point rating scale, ranging from 1 – *Never* to 6 - *20 or more times*. Analyses of data from 5,532 adolescents from 37 schools in four states found support for separate factors representing physical aggression, verbal aggression, relational aggression, substance use, and other delinquent behavior, and victimization. Support was also found for strong measurement invariance across gender, geographic locations, and grades (Farrell et al., 2016). The Physical and Relational Aggression scales demonstrated concurrent validity with measures of related constructs including teacher ratings of adolescents' adjustment and adolescents' report of their beliefs, values, and peer associations. Internal consistency was strong across subscales, with alpha coefficients from .77 to .81.

**Nonviolent Intentions.**—The Effective Nonviolent Intentions scale from the Behavioral Intentions Scale was used to assess the propensity to use nonviolent responses in peer

conflict situations. Adolescents are presented with 18 situations paired with a specific response and asked to rate their likelihood of making that responses in that situation on a 5-point rating scale from 1 - *Definitely would not* to 5 - *Definitely would* (alpha = .71). The problem situations and responses for the five items on the Effective Nonviolent Intentions scale were selected using the same process described for the Friends' Support for Fighting and Nonviolence scale (e.g., in response to a situation where the adolescent was blamed for starting a rumor: "If you were in that situation, do you think you would talk it out with the person the rumor was about and explain that you didn't start it?").

**Physical Aggression and Prosocial Behavior.**—The Problem Behavior Frequency Scale – Teacher Report Form (PBFS-TR) is a teacher report form of the PBFS with separate factors representing physical, verbal, and relational aggression, overt and relational victimization, prosocial behavior, and effective nonviolent behavior. Teachers rate how frequently the identified adolescent engaged in each behavior in the past 30 days using a 4-point scale, where 1 = *Never*, 2 = *Sometimes*, 3 = *Often* and 4 = *Very Often*. Analyses of the PBFS-TR have found support for its overall structure, and measurement invariance over time, gender, and grade. The PBFS-TR scales were found to have strong correlations with corresponding scales on the Social Skills Improvement System (Elliott & Gresham, 2008) and significant correlations with corresponding scales on the PBFS-AR. The current study used the Physical Aggression scale, which consists of 7 items (e.g., "Hit or slapped someone; alpha = .90), and the Prosocial Behavior scale, which consists of 7 items (e.g., "Said nice things or complimented someone just to be nice;" alpha = .92).

## Results

### Psychometric Analyses of Each Peer Influence Measure

Confirmatory factor analyses were used to compare competing models of the structure of each of the three peer measures. Analyses were conducted in Mplus 7.4 using weighted least squares mean- and variance-adjusted estimators (WLSMV) that treated scores on each item as ordered categorical variables rather than as equal interval scales. This is comparable to a graded response item-response theory model. Measurement parameters include factor loadings and item thresholds. Thresholds represent the value of the underlying latent variable (e.g., Friends' Delinquent Behavior) at which there is a .50 probability of crossing into the next category on the rating scale (e.g., moving from *None of them* to a higher category) (Embretson & Reise, 2000). Item information curves (Fraley, Waller, & Brennan, 2000) were examined to identify items that contributed limited information to assessing each construct. We also summed item information across items to determine the overall reliability of each factor. Unlike classical test theory, which provides a single estimate of reliability, item-response theory takes into account the fact that precision of measurement may vary across levels of the construct being measured. For scales hypothesized to assess two factors, we examined the root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis fit index (TLI), and the difference test function in MPlus (Muthén & Asparouhov, 2006) to determine if the two-factor model represented a significantly better fit than a one-factor model.

**Friends' Behavior.**—Item information curves based on the two-factor model indicated that three of the ten items on the Friends' Delinquent Behavior factor and one of the seven items on the Friends' Prosocial Behavior factor made a limited contribution to the measurement of those constructs. Deleting these four items resulted in a two-factor model that fit the data very well and significantly improved the fit compared with the one-factor model (see Table 1). Reliability estimates based on total item information curves for the Friends' Delinquent Behavior factor indicated that the reliability was .70 or higher for individuals with scores between 0.60 and 4.0. This indicates a floor effect such that the scale was best able to differentiate among individuals at fairly high levels of friends' delinquent behavior (i.e., factor scores had a mean of 0 and SD of 1.0). In contrast, reliability for the Friends' Prosocial Behavior factor was .70 or higher for individuals with scores between -1.6 and 1.8.

**Friends' Support for Fighting and Nonviolence.**—Inspection of item information curves based on the two-factor model identified one item on each factor that made a limited contribution to measurement of the underlying construct. Deleting these items resulted in a two-factor model that fit the data very well and represented a significant improvement in fit over the one-factor model (see Table 1). Reliability was .70 or higher for adolescents with scores on the Friends' Support for Fighting scale between -0.8 and 1.4. Reliability was .70 or higher for adolescents with scores on the Friends' Support for Nonviolence factor between -1.4 and 0.8.

**Peer Pressure for Fighting.**—Although participants rated items on a 6-point scale, initial analyses indicated that very few participants (i.e., 0% to 3%) used the two highest frequency categories. Extremely low frequencies create problems for the WLSMV estimator, which requires non-zero values in two-way frequency tables for each pair of variables included in the analysis. We therefore recoded all items into a 4-point scale by combining the three higher-order frequency categories (i.e., 6-9 times, 10-19 times, and 20 or more times). This was also supported by initial analyses of thresholds that indicated little differentiation between thresholds for higher points on the scale. An initial one-factor model had an acceptable fit based on the CFI and TLI, but was below the cutoff on the RMSEA (i.e., RMSEA = .107). Item information curves indicated that two of the seven items made a limited contribution to the factor's reliability. Deletion of these two items resulted in a one-factor model that fit the data very well (see Table 1). Reliability was .70 or higher for adolescents with scores between -0.2 and 2.8.

### Overall Structure of Peer Influences

After establishing the structure of the individual measures, we tested a full model that included items from all three measures to test our hypothesis that there are multiple distinct dimensions of peer influence. We compared the fit of a five-factor model with a two-factor model. The five-factor model specified separate factors representing Friends' Support for Fighting, Friends' Support for Nonviolence, Friends' Delinquent Behavior, Friends' Prosocial Behavior, and Peer Pressure for Fighting. The two-factor model specified broader factors represented by a Peer Support for Problem Behavior factor measured by items on the Friends' Support for Fighting, Friends' Delinquent Behavior, and Peer Pressure for Fighting;

and a Peer Support for Prosocial Behavior factor measured by items on the Friends' Prosocial Behavior and Friends' Support for Nonviolence scales. As hypothesized, the five-factor model fit the data very well (RMSEA = .03, CFI = .97, TLI = .97) and significantly improved upon the fit of the two-factor model (see Models 1 and 2 in Table 2). Standardized factor loadings for the seven-factor model were all significant, ranging from .58 to .87. All but five of the 29 loadings were greater than .70. Correlations among the five factors are reported in Table 3. Correlations among the three factors assessing deviant peer influences ranged from .28 to .51. This suggests that the three factors represent related, but fairly independent dimensions of deviant peer influences. The two factors representing prosocial peer influences were also moderately correlated ( $r = .44$ ). Within the Friends' Behavior scale, the factors representing Friends' Delinquent Behavior and Friends' Prosocial Behavior were not significantly correlated, suggesting that they represent independent dimensions of peer influence. This contrasts with the fairly large negative correlation between the two factors within the Friends' Support for Fighting and Nonviolence scale ( $r = -.83$ ), which suggests that adolescents who anticipated favorable reactions from their friends for an aggressive response also anticipated friends' negative reactions if they chose a nonviolent response.

To test the hypothesis that the structure and measurement parameters of these factors would be consistent across grade and gender, we used multiple group analyses to compare an unconstrained model that specified the same structure for each group (i.e., configural invariance) to a model that constrained corresponding factor loadings and thresholds to the same values across groups (i.e., scalar or strong factorial invariance). We followed the recommendations of Cheung and Rensvold (2014) who argued that a change in the CFI (i.e., CFI) of less than .01 provides a more appropriate test of model invariance than the chi-squared difference test because the latter is more sensitive to sample size. The model imposing scalar invariance (i.e., loadings and item thresholds constrained to the same values across gender) fit the data very well and resulted in a negligible decrease in fit (CFI = -.001) compared to a model specifying configural invariance (see Models 3 and 4 in Table 2). The model imposing scalar invariance across grades also fit the data well and resulted in a slight improvement in fit based on the CFI (CFI = .001, see Models 5 and 6 in Table 2). In addition to invariance across grade and gender, support was found for scalar invariance across intervention conditions (see Model 8 in Table 2), indicating that the presence of the intervention did not influence the measurement properties of the three measures of peer influences

Establishing scalar invariance made it possible to make meaningful comparisons of adolescents' exposure to different peer influences across gender and grades. Several significant gender differences were found. Compared to girls, boys reported that their friends were significantly more likely to support fighting and less likely to support nonviolence. Boys also reported that their friends engaged in significantly lower frequency of prosocial behavior (see Table 3). In contrast, there were no gender differences in adolescents' experiences of peer pressure for fighting or friends' frequency of engaging in delinquent behavior. There were also significant differences across grades, such that compared to sixth grade students, seventh and eighth grade students reported that their friends were more likely to support fighting and less likely to support nonviolence. Also compared to sixth grade

students, seventh and eighth grade students reported that their friends engaged in higher frequency of delinquent behavior and lower frequency of prosocial behavior.

### **Relationship Between Peer Factors and Measures of Problem and Prosocial Behaviors**

We used two approaches to examine relationships between peer influences and concurrent measures of problem behavior (physical and relational aggression, substance use, and other delinquent behavior) and prosocial behavior (intentions to use nonviolent responses and prosocial behavior). We examined correlations to assess first-order relations among latent variables representing each construct (see Figure 1). We also used regression analyses to determine the unique and combined contribution of the five peer factors for predicting adolescents' problem and prosocial behaviors after controlling for intervention condition, gender, and grade (dummy coded). Models that included teacher ratings were examined separately using a data set that excluded observations collected in the summer when teacher ratings were not obtained ( $N = 1,345$ ). We conducted multiple group analyses to examine gender differences in correlations between peer factors and the other variables within the measurement model, and differences in regression coefficients within the regression model. In order to reduce the family-wise Type I error rate for these analyses, we only reviewed significance tests on gender differences in individual parameters (i.e., correlations or regression coefficients) if an overall Wald test was significant for each peer factor's relationships to adolescents' self-reported problem behaviors and nonviolent intentions. Because there were only two concurrent teacher report measures (Physical Aggression and Prosocial Behavior), we used a per-test significance of  $p < .01$  based on a Bonferroni adjustment to maintain a family-wise error rate of  $p < .05$  for those comparisons.

Peer influences explained a large proportion of variance in adolescents' problem and prosocial behaviors. The model with correlations among latent variables representing the peer factors and measures of behavior based on adolescents' self-reports fit the data very well (see Model 9 in Table 2), as did the model based on teachers' ratings of students' behavior (see Model 13 in Table 2). Aim 2 of the study was to assess the extent to which different peer influences were uniquely related to adolescents' problem and prosocial behaviors, and it was hypothesized that all five domains of peer influence would be uniquely related to adolescents' behaviors. To test this hypothesis, a regression model based on concurrent measures completed by adolescents was examined. This model fit the data very well (see Model 11 in Table 2). Within this model, peer influences accounted for an additional 46% to 56% of the variance in adolescents' problem behaviors and 23% of the variance in adolescents' nonviolent intentions, relative to a model that included only the covariates (see Table 4). The overall pattern was for friends' delinquent behavior to have the strongest relationships with delinquent behavior and substance use, and for peer pressure for fighting to have the strongest relationships with the measures of aggression. The regression model examining relations with teacher ratings also fit the data very well (see Model 14 in Table 2), with peer influences accounting for an additional 7% of the variance in the teacher-reported physical aggression and 3% of the variance in teacher-reported prosocial behavior. The following sections discuss findings specific to each of the five peer factors.

**Friends' Delinquent Behavior.**—Friends' delinquent behavior was positively associated with adolescents' concurrent problem behavior, as expected. It had large positive correlations with physical and relational aggression, substance use, and other delinquent behaviors based on adolescents' report ( $r_s = .56$  to  $.71$ ), and a small, but significant correlation with physical aggression based on teachers' ratings ( $r = .11$ ). Although not significantly related to the adolescents' nonviolent intentions, friends' delinquent behavior was negatively correlated with prosocial behavior as measured by teachers' ratings ( $r = -.13$ ). The regression analysis indicated that friends' delinquent behavior accounted for a unique portion of the variance in each of the four problem behaviors based on adolescent reports. Furthermore, friends' delinquent behavior emerged as the strongest predictor of adolescents' delinquent behaviors and substance use after controlling for the other domains of peer influence and covariates (see Table 4). It did not, however, account for a unique proportion of the variance in the adolescents' self-reported nonviolent intentions or teacher-reported physical aggression or prosocial behavior. Gender differences in correlations were examined to test the hypothesis that friends' delinquent behaviors would be more closely associated with problem behaviors among girls than among boys. There were significant gender differences in the correlations between the friends' delinquent behavior and adolescent-reported behaviors ( $\chi^2[5] = 15.66, p = .008$ ). We found mixed support for our hypothesis that friends' delinquent behavior would have stronger relations with problem behaviors for girls than for boys. Follow-up analyses indicated the correlation between friends' delinquent behavior and substance use was significantly stronger among girls than among boys ( $r_s = .73$  and  $.60$ , respectively). However, there were no significant gender differences in the correlation between friends' delinquent behavior and teacher-reported physical aggression or prosocial behavior.

**Friends' Support for Fighting.**—Friends' support for fighting was associated with adolescents' concurrent problem and prosocial behavior, in the expected directions. It was positively correlated with all adolescent-reported physical and relational aggression, substance use, and other delinquent behaviors ( $r_s = .30$  to  $.34$ ), as well as with teacher ratings of physical aggression ( $r = .17$ ). It was negatively correlated with prosocial behavior based on both student and teacher reports ( $r = -.32$  and  $-.14$ , respectively). Within the regression analyses, friends' support for fighting accounted for a unique portion of variance of adolescents' self-reported physical aggression, but not for the other adolescent-reported problem behaviors or for teacher-reported physical aggression. Our exploratory analyses of gender differences did not reveal differences in correlations between friends' support for fighting and adolescent-reported behaviors ( $\chi^2[5] = 3.64, p = .602$ ) or in coefficients within the regression model ( $\chi^2[5] = 2.40, p = .663$ ). Similarly, there were no gender differences in the relationships between friends' support for fighting and teacher-reported problem and prosocial behavior.

**Peer Pressure for Fighting.**—Peer pressure for fighting had large positive correlations with adolescent reports of their frequency of problem behavior ( $r_s = .47$  to  $.68$ ), and was the strongest predictor of the three measures of aggression ( $r_s = .62, .68$ , and  $.22$  for adolescent' reported physical aggression and relational aggression, and teacher-reported physical aggression, respectively). Although peer pressure for fighting was not significantly

correlated with self-reported nonviolent intentions, it was inversely correlated with teacher-reported prosocial behavior. Within the regression models, peer pressure for fighting accounted for a unique portion of the variance in all four problem behavior factors based on adolescent report and teacher-reported physical aggression after controlling for the other peer factors. Gender differences were examined to test the hypothesis that peer pressure would be more strongly associated with problem behaviors for boys. The Wald test indicated significant gender differences in correlations between the peer pressure for fighting and the adolescent-reported problem and prosocial behaviors ( $\chi^2[5] = 14.26, p = .014$ ). Follow-up analyses indicated that compared with girls, peer pressure for fighting was more strongly correlated with self-reported physical aggression ( $r_s = .68$  versus  $.57$ ) and delinquent behavior for boys ( $r_s = .68$  versus  $.49$ ). However, there were no gender differences in the relationships between peer pressure for fighting and teacher-reported problem and prosocial behavior.

**Friends' Prosocial Behavior.**—As expected, friends' prosocial behavior was positively correlated with adolescent-reported nonviolent intentions ( $r = .48$ ) and teacher-reported prosocial behavior ( $r = .14$ ). It also had a significant, but small, negative correlation with adolescent-reported substance use ( $r = -.12$ ) and teacher-reported physical aggression ( $r = -.16$ ). Within the regression analyses controlling for other peer factors and covariates, friends' prosocial behavior was uniquely associated with both adolescent-reported nonviolent intentions and teacher-reported prosocial behavior. Friends' prosocial behavior also emerged as a unique predictor of adolescent-reported substance use and teacher-reported physical aggression, in the expected direction. Exploratory analyses of gender differences based on Wald tests did not identify any gender differences in its correlations with concurrent measures or in regression coefficients.

**Friends' Support for Nonviolence.**—Friends' support for nonviolence showed the expected pattern of positive correlations with adolescent-reported nonviolent intentions ( $r = .34$ ) and teacher-reported prosocial behavior ( $r = .14$ ). It was also negatively correlated with adolescent-reported physical and relational aggression, substance use, and other delinquent behaviors ( $r_s = -.33$  to  $-.29$ ) and with teacher-reported physical aggression ( $r = -.14$ ). Within the regression analysis, friends' support for nonviolence was uniquely related to the nonviolent intentions after controlling for the other peer measures (excluding friends' support for fighting), but not to teacher-reported prosocial behavior. Exploratory analyses of gender differences did not identify any significant gender differences in the patterns of correlations between friends' support for nonviolence and self- or teacher-reported problem or prosocial behaviors, or any gender differences in regression coefficients.

## Discussion

Although peers are among the most salient influences on behavior during adolescence (e.g., Akers, 1998; Allen et al., 2006), the relative importance of specific mechanisms of peer influence is not well understood. Prior studies have identified multiple forms of peer influence including peer behavior, peer reactions to adolescents' behavior, and peer pressure (e.g., Farrell, Henry, Mays, & Schoeny, 2011) that may affect prosocial behavior as well as problem behaviors such as aggression, substance use, and delinquent behavior (Lipsey

& Derzon, 1998). Whereas peers may influence adolescents' behavior in multiple ways, previous studies have typically focused on a single aspect of peer influence and its relation to a specific form of problem behavior (e.g., Meter et al., 2015). This makes it unclear whether there are distinct domains of peer influence that exert unique effects on adolescents' behaviors or whether peer influences can be captured by a single overall dimension. There has also been limited research on the impact of prosocial peer influences. This study addressed these issues by investigating the extent to which there is support for distinct domains of deviant and prosocial peer influence, and by evaluating the relative influence of each domain on adolescents' prosocial behaviors and specific forms of problem behaviors including physical aggression, substance use, and delinquent behavior. We also explored gender differences in the relationships between peer influences and adolescents' behaviors. The resulting findings have important implications for efforts to identify and address specific risk and protective factors within the peer domain that influence adolescents' adjustment.

Support was found for distinct dimensions of both delinquent and prosocial peer influences representing friends' behaviors, perceived friends' reactions to behavior in conflict situations, and peer pressure for fighting. These dimensions were differentiated by both the form (i.e., friends' behaviors versus friends' support for adolescents' behaviors) and the nature of that influence (i.e., support for problem behavior versus prosocial behavior). Measures of these five dimensions demonstrated strong measurement invariance across both gender and grades. In general, factors representing these dimensions showed the expected patterns of correlations with both adolescent and teacher reports of adolescents' behavior. Although support was found for distinct domains of peer influence, the more critical question is whether there is any added value in studying multiple domains of influence. Based on the results of the regression analyses the answer appears to be "yes." In particular, multiple domains of peer influence were uniquely related to adolescents' reports of their frequency of problem behaviors and nonviolent intentions, and to teachers' ratings of adolescents' physical aggression and prosocial behavior.

### **Understanding Both Deviant and Prosocial Influences**

A major finding of this study is the importance of measuring both peers' deviant and prosocial influences on adolescents' behavior. Of note, there was no significant correlation between friends' delinquent behavior and friends' prosocial behavior. This suggests that these are not simply opposite ends of the same continuum. Adolescents whose friends engage in delinquent behavior also have friends who engage in prosocial behavior. The fact that each of these factors was uniquely related to adolescents' behavior underscores the need to broaden the focus of peer influences to include peers' prosocial influences as well as their negative influences. The wording of the Friends' Behavior measure does not provide a basis for determining whether the nonsignificant correlation is due to adolescents having associations with both delinquent and prosocial peers or whether friends who engage in delinquent behavior also engage in prosocial behavior. This has important implications for further research in this area. In particular, if the latter is true, it suggests that describing peers' and friends' behavior (e.g., friends' delinquent behavior) may be more appropriate than labeling peers or friends as delinquent (e.g., delinquent peers), which is typical of research in this area. The very limited research that has simultaneously examined the deviant



and prosocial influences of peers supports the value of studying both types of influences. For example, Carson (2013) found that friends' delinquent and prosocial behaviors both uniquely contributed to youth's delinquent attitudes.

In contrast to the lack of relationship between friends' delinquent and prosocial behaviors, friends' support for fighting and friends' support for nonviolence were highly negatively correlated. Taken together, these findings suggest that although adolescents are able to identify that their friends engage in both delinquent and prosocial behaviors, they anticipate that their friends will support either nonviolent responses or aggressive responses, but not both. Many of the hypothetical conflict situations involved provocations in which adolescents may have competing goals of relationship repair, conflict avoidance, or image and status maintenance. It is possible that a friend group has a culture in which one goal is valued above others, which would determine friends' reactions to adolescents' behavior choices and make it unlikely that a friend group would support both fighting and nonviolence.

### **The Strong Influence of Peer Pressure**

Peer pressure for fighting showed the most consistent pattern of relations with adolescents' problem behavior. Within the regression analyses, it was the strongest predictor of adolescents' reports of their frequency of physical and relational aggression and teacher ratings of physical aggression. Although friends' behavior emerged as an important predictor, peer pressure for fighting accounted for a significant portion of the variance of each measure of problem behavior as well. Peer pressure for fighting was also negatively correlated with nonviolent intentions and with teacher ratings of prosocial behavior. This highlights the significant impact direct peer pressure has on adolescent behavior over and above friends' actual behavior, as well as the more distal perception of how friends would respond to adolescents' behavior in conflict situations. This finding is consistent with prior studies that have found relationships between peer pressure and general measures of problem behavior, delinquent behavior, and substance use (e.g., Allen et al., 2006; Padilla-Walker & Carlo, 2007; Santor et al., 2000; Sullivan, 2006). It is possible that interventions can impact adolescents' behavior by changing peer pressure. One study found that reduction in peer pressure to engage in problem behavior mediated the effects of an intervention on adolescents' problem behavior (Hay, Wang, Ciaravolo, & Meldrum, 2015).

### **Friends' Behavior Trumps Friends' Reactions**

Friends' delinquent behavior was uniquely associated with adolescents' physical and relational aggression, delinquent behavior, and substance use, even after controlling for the other peer factors. This is consistent with prior work that has found reciprocal relations between adolescents' and their friends' behaviors (Wang, Hipp, Butts, Jose, & Lakon, 2016). As expected, friends' delinquent behavior was more strongly related to self-reported substance use and delinquent behavior to self-reported physical and relational aggression. Similarly, friends' prosocial behavior was uniquely associated with adolescents' reports of nonviolent intentions and teacher ratings of adolescents' prosocial behaviors. Having friends who engaged in prosocial behaviors was also uniquely and inversely related to substance use, even after controlling for peer influences for problem behavior. Some of the

literature investigating prosocial behavior has conceptualized it as an integral component of social competence and a key developmental milestone within childhood and adolescence (Monahan & Booth-LaForce, 2015). Although research has shown that adolescents' social competence is a protective factor against maladjustment (Bornstein, Hahn, & Haynes, 2010; Monahan & Steinberg, 2011), more work is needed to understand how close friends' social competence influences adolescents' development. Studies have found that more positive interactions and fewer negative interactions between friends were associated with adolescents' own prosocial behavior (Barry & Wentzel, 2006; Monahan & Booth-LaForce, 2015). It is possible that measures of adolescents' and friends' prosocial behavior may, to some degree, represent a proxy for the social reciprocity between adolescents and their friends. That is, adolescents may be reporting on their friends' prosocial behavior towards themselves rather than to the non-friend others.

In contrast to the unique predictive power of friends' behavior, friends' support for fighting was generally not uniquely associated with adolescents' behavior after taking other peer influences into account. This is similar to a previous study that found friends' behavior to be a stronger predictor of adolescents' problem behavior than friends' attitudes towards problem behavior (Haynie, 2002). It is possible that when adolescents answer questions about their friends' possible reactions in hypothetical situations, they base their answers on their knowledge of their friends' behaviors and values, rather than on previous experiences of their friends' reactions in specific situations. In that case, measurement of friends' support for fighting may be a more distal proxy of adolescents' perception of friends' aggressive behaviors. Similarly, friends' support for nonviolence was not uniquely related to adolescents' prosocial behavior after controlling for friends' prosocial behavior and other peer influences, although it was uniquely related to nonviolent intentions. Again, this suggests that perceptions of friends' behavior, rather than perceptions of friends' support for different behaviors, is a better predictor of adolescents' behaviors.

### **Gender Moderation of Peer Influences**

Although support was found for measurement invariance across gender, there were several significant differences in rates of exposure to different peer influences between boys and girls. Boys indicated that their friends were more likely to support fighting and less likely to support nonviolent responses. Boys also reported lower levels of prosocial behavior among their friends. These findings align with past research that has found boys to engage in higher levels overt aggression and delinquent behavior (Card, Stucky, Sawalani, & Little, 2008) and lower levels of prosocial behavior (Barry & Wentzel, 2006; van Rijsewijk, Dijkstra, Pattiselanno, Steglich, & Veenstra, 2016). The current study did not find any differences in the frequency of peer pressure for fighting between boys and girls within this sample. This may be partially explained by contextual differences, in that gender differences emerged when adolescents were asked to think about their close friends versus peers in general. Peer pressure may also be a unique type of peer influence that is so pervasive throughout middle schools that it is difficult to discern gender differences.

Gender differences in the relationships between peer factors and adolescent behaviors were also identified. Consistent with our hypotheses, the peer pressure for fighting was

more strongly correlated with physical aggression and delinquent behavior among boys than among girls. This is consistent with past studies that have found peer pressure to have a stronger influence on boys than girls, particularly for traditional cultural norms of masculinity such as physical aggression (e.g., Galambos, 2004; Santor et al., 2004). Within the current study, the relationship between friends' delinquent behavior and adolescents' substance use was significantly stronger among girls. Girls may be more likely to use drugs to gain approval from friends (Tomeo et al., 1999) although this is not a consistent finding across studies (e.g., Clark, Belgrave, & Abell, 2011). A prior systematic review indicated that boys are more focused on activities that enhance their social status, whereas girls are more focused on relationship-enhancing and connection-oriented behaviors (Rose & Rudolph, 2006). As such, future work should investigate possible mechanisms that may explain gender differences between peer influences and adolescent behavior, such as identifying which behaviors function as relationship-building versus status-enhancing. Interestingly, there were no gender differences in the association between friends' prosocial behavior and adolescents' behavior. Future research should continue to explore whether friends' prosocial behaviors are equally promotive for both boys and girls.

### **Differences in Relations With Teacher-Reported versus Self-Reported Behaviors**

Peer influences were more strongly associated with adolescents' reports of their behavior than with teacher ratings of adolescents' behavior, and peer factors explained much less of the variance of teachers' report of adolescents' behavior compared with adolescents' report. This is not surprising in that teachers' observations are limited to the school setting and to how adolescents behave in their presence. Teachers have also been found to be better reporters of their overall impressions of an adolescent than an objective reporter of the frequency of any specific behavior (De Los Reyes & Kazdin, 2005). However, all peer factors, with the exception of friends' delinquent behavior, were correlated with teacher ratings of physical aggression and prosocial behaviors in the expected directions. This suggests that the pattern of findings is not solely a result of method-specific variance.

### **Limitations**

The current study had several limitations. Critics of using adolescents' reports of peer constructs assert that adolescents assume their peers are more similar to them than what is suggested by their peers' self-report (Boman et al., 2012) and therefore, argue that these measures are in fact measures of adolescents' own behavior (Gottfredson & Hirschi, 1990). Although adolescents' report and peers' own report of their behavior have been found to be distinct constructs (Young et al., 2014), adolescents' perceptions of their peers' behavior are associated with their peers' self-reported behavior. Adolescents' perceptions of their peers' behavior are also uniquely associated with their own behavior. Therefore, adolescents' perceptions of their friends and peers likely play an important role in their behavior choices. Furthermore, using teachers' report of adolescents' behavior limits the effects of shared method variance and, in this study, supported the overall findings that adolescents' behavior is related to their perceptions of their friends and peers. Because the sample was drawn from schools that served a predominantly African American student population many of whom lived in neighborhoods with high rates of crime and poverty, it is not clear how well these findings would generalize to other adolescents. The lack of diversity also prevented

us from examining the possible moderating role of race or ethnicity on the relation between peer influences and adolescent behavior. Further work is needed to establish measurement invariance across a more diverse sample.

The cross-sectional nature of the current study limits the ability to make statements about the direction of effects. It is likely that peer factors, particularly friends' behaviors and attitudes, and adolescents' behaviors are reciprocal, as suggested by ecological models of development (Bronfenbrenner, 1979). The present study supported the notion that there are multiple dimensions of both deviant and prosocial peer influences, and that they have unique associations with both problem behavior and prosocial behavior. Support was also found for the three new scales designed to assess these constructs. This hopefully lays the groundwork for future research examining reciprocal longitudinal relations between each of the current study's peer constructs and adolescent behavior. Future longitudinal research should explore the reciprocal relation between a range of peer factors and a range of adolescent behaviors. It should also explore the mechanisms through which peers influence adolescents' behavior and the potential role of peers as protective factors. For example, it is possible that peer pressure for fighting mediates the relation between friends' delinquent behaviors and adolescents' aggression. It may also be that friends' prosocial behavior buffers the effect of peer pressure for fighting on adolescents' aggression. Social network analysis, in which each adolescent identifies their friends and then reports on their own behaviors, may be particularly well-suited to explore these relations over time. Although not within the scope of this study, it is likely that peer pressure to engage in other risky behaviors (e.g., relational aggression, substance use, early first sex, truancy, extreme dieting) would also play an important role in the development of adolescents' problem behaviors. Future research should work towards developing measures of peer pressure for other risky behaviors, particularly when evaluating prevention programs that focus on their reduction.

### Implications and Future Directions

This study highlights the need for further research to address multiple dimensions of peer influence. Researchers should be encouraged to take a broad approach when assessing peers' influence on adolescent behaviors. Our findings suggest the need to assess not only deviant peer influences, but also prosocial influences that might exert a promotive or protective influence on adolescents' behavior. This was particular true for friends' prosocial behavior, which was uniquely related to adolescents' nonviolent intentions and prosocial behaviors. The measures assessing peer pressure for fighting and friends' delinquent and prosocial behavior were particularly effective in explaining the variance in adolescents' behaviors, and may be of use when exploring mechanisms of change in prevention research. Researchers should also take a broader approach in terms of assessing the impact of peer influence on a range of behavioral outcomes rather than only delinquent behavior. In order to effectively reduce adolescents' fighting, delinquent behaviors, and substance use, we must replace those behaviors with other, more prosocial behaviors that meet adolescents' needs for belonging, intimacy, and autonomy. To do that, intervention scientists need to know which peer factors help to develop and maintain prosocial alternatives so that they might cultivate those peer factors.

Differences in exposure to peer influences across grades point to the need for early intervention in middle school. Sixth grade students reported the same exposure to peer pressure for fighting as did seventh and eighth grade students. However, friends' delinquent influences were higher, and friends' prosocial influences were lower, in seventh and eighth grade compared to sixth grade. This suggests that sixth grade students are exposed to the more pervasive influence of peer pressure within the broader school climate immediately upon entering middle school, but that changes in friends' behaviors and attitudes occur over time. This is consistent with prior longitudinal studies that have found increases in deviant peer influences as adolescents move through the middle school (Farrell et al., 2011; Sumter et al., 2009). Peers may be particularly influential when there is a lack of fit between adolescents' developmental needs and their environment contexts (e.g., the larger student population and reduced adult supervision in middle school; Eccles, 2008). This highlights the need for intervention at the beginning of middle school. This strategy might mitigate the effects of school culture related to fighting on changes in adolescents' and their friends' behaviors and attitudes by intervening prior to adolescents having prolonged exposure to a school culture in which peer pressure for fighting is prevalent.

## Conclusion

This study examined multiple domains of peer influence and their relationship to the development of prosocial behavior and problem behaviors during adolescence. Prior research has identified multiple mechanisms through which peers can influence adolescents' behavior. These include association with deviant peers (e.g., Brumley & Jaffee, 2016; Lipsey & Derzon, 1998), perceived peer reactions to aggressive behavior (e.g., Bastiaensens et al., 2015; Sandstrom et al., 2013), and direct peer pressure (e.g., Allen et al., 2006; Santor et al., 2000; Sullivan, 2006). The present study built upon and extended prior work by investigating multiple domains of peer influence on both prosocial behavior and specific forms of problem behavior. These domains were characterized by their mechanism of influence (i.e., friends' behavior, perceptions of friends' reactions to behavior, and direct pressure), and the type of behavior they supported (i.e., problem behavior versus prosocial behavior). Our findings revealed unique associations between different forms of peer influence and specific forms of adolescents' behavior suggesting the value of studying the multiple ways in which peers might influence behavior. For example, friends' delinquent behavior was uniquely related to problem behaviors after controlling for peer pressure for fighting and for friends' support for fighting. This suggests that associating with delinquent peers may exert a subtle influence on behavior even after controlling for more direct influences such as peer pressure and concerns about friends' reactions. A unique contribution of this study was its examination of prosocial peer influences. Friends' prosocial behavior and friends' support for nonviolence were both uniquely associated with adolescents' intentions to use nonviolent approaches to problem situations even after controlling for deviant peer influences. This suggests that efforts to promote prosocial behavior might target enhancing prosocial peer influences rather than focusing solely on reducing deviant peer influences. This is consistent with broader efforts to promote positive development that attempt not only to reduce risk factors, but also to increase promotive factors (Catalano et al., 2002; Coie et al., 1993). Overall, our findings highlight the complex nature of peer influences during adolescence and

the need to consider the multiple mechanisms through which peers may influence specific forms of problem behaviors as well as prosocial behavior.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Funding

This study was funded by the National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, CDC Cooperative Agreements 5U01CE001956 and 1 U49 CE000730. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

## References

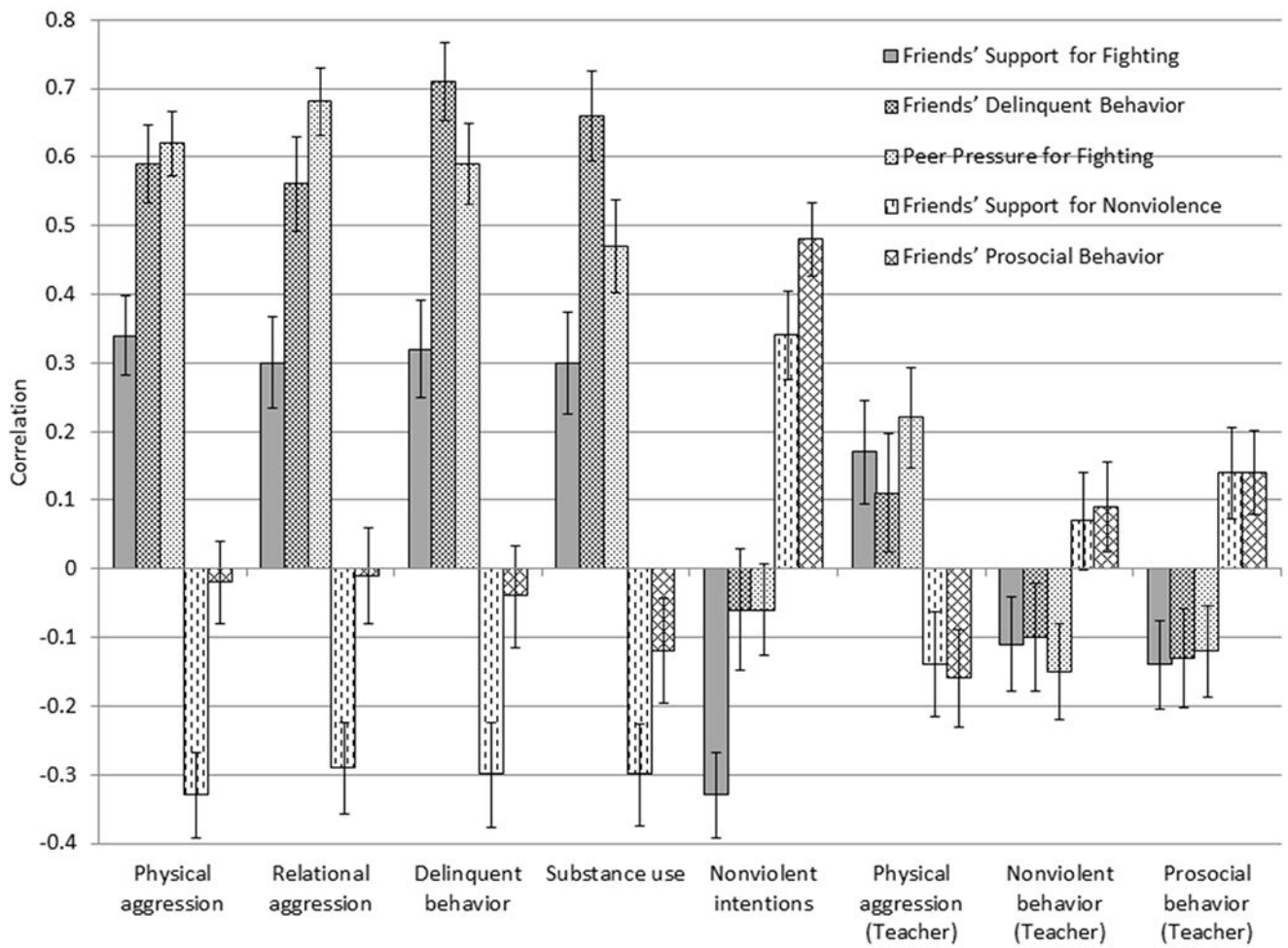
- Akers RL (1998). *Social learning and social structure: A general theory of crime and deviance*. Boston: Northeastern University Press.
- Allen JP, Porter MR, & McFarland FC (2006). Leaders and followers in adolescent close friendships: Susceptibility to peer influence as a predictor of risky behavior, friendship instability, and depression. *Development and Psychopathology*, 18(1), 155–172. doi:10.1017/S0954579406060093 [PubMed: 16478557]
- Allison KW, Edmonds T, Wilson K, Pope M, & Farrell AD (2011). Connecting youth violence prevention, positive youth development, and community mobilization. *American Journal of Community Psychology*, 48(1–2), 8–20. doi:10.1007/s10464-010-9407-9 [PubMed: 21246272]
- Assink M, van der Put CE, Hoeve M, de Vries SL, Stams GJJ, & Oort FJ (2015). Risk factors for persistent delinquent behavior among juveniles: A meta-analytic review. *Clinical Psychology Review*, 42, 47–61. doi: 10.1016/j.cpr.2015.08.002 [PubMed: 26301752]
- Barry CM, & Wentzel KR (2006). Friend influence on prosocial behavior: The role of motivational factors and friendship characteristics. *Developmental Psychology*, 42(1), 153–163. doi:10.1037/0012-1649.42.1.153 [PubMed: 16420125]
- Bastiaensens S, Pabian S, Vandebosch H, Poels K, Van Cleemput K, DeSmet A, & De Bourdeaudhuij I (2016). From normative influence to social pressure: How relevant others affect whether bystanders join in cyberbullying. *Social Development*, 25(1), 193–211. doi:10.1111/sode.12134
- Bell NJ, & Baron EK (2015). Resistance to peer influence during adolescence: Proposing a sociocultural-developmental framework. *New Ideas in Psychology*, 39, 53–62. doi:10.1016/j.newideapsych.2015.07.005
- Boman IV, J. H, Stogner JM, Miller BL, Griffin OH III, & Krohn MD. (2012). On the operational validity of perceptual peer delinquency: Exploring projection and elements contained in perceptions. *Journal of Research in Crime and Delinquency*, 49(4), 601–621. doi:10.1177/0022427811419367
- Bornstein MH, Hahn C, & Haynes OM (2010). Social competence, externalizing, and internalizing behavioral adjustment from early childhood through early adolescence: Developmental cascades. *Development and Psychopathology*, 22(4), 717–735. doi:10.1017/S0954579410000416 [PubMed: 20883577]
- Boxer P, Tisak MS, & Goldstein SE (2004). Is it bad to be good? An exploration of aggressive and prosocial behavior subtypes in adolescence. *Journal of Youth and Adolescence*, 33(2), 91–100. doi:10.1023/B:JOYO.0000013421.02015.ef
- Bronfenbrenner U (1979). Contexts of child rearing: Problems and prospects. *American Psychologist*, 34(10), 844–850. doi:10.1037/0003-066X.34.10.844
- Brown BB (1990). Peer groups and peer cultures. In Feldman SS Elliott GR (Ed.), *At the threshold: the developing adolescent*. Cambridge, MA, US: Harvard University Press.
- Brown BB (2004). Adolescents' relationships with peers. In Lerner RM Steinberg L (Ed.), *Handbook of Adolescent Psychology*. Hoboken, NJ, US: John Wiley & Sons Inc.

- Brumley LD, & Jaffee SR (2016). Defining and distinguishing promotive and protective effects for childhood externalizing psychopathology: A systematic review. *Social Psychiatry And Psychiatric Epidemiology*, 51(6), 803–815. doi: 10.1007/s00127-016-1228-1 [PubMed: 27130443]
- Caprara GV, Luengo Kanacri BP, Zuffianò A, Gerbino M, & Pastorelli C (2015). Why and how to promote adolescents' prosocial behaviors: Direct, mediated and moderated effects of the CEPIDEA school-based program. *Journal of Youth and Adolescence*, 44(12), 2211–2229. doi:10.1007/s10964-015-0293-1 [PubMed: 25963445]
- Card NA, Stucky BD, Sawalani GM, & Little TD (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development*, 79(5), 1185–1229. doi:10.1111/j.1467-8624.2008.01184.x [PubMed: 18826521]
- Carson DC (2013). Perceptions of prosocial and delinquent peer behavior and the effect on delinquent attitudes: A longitudinal study. *Journal of Criminal Justice*, 41(3), 151–161. doi:10.1016/j.jcrimjus.2013.01.005
- Catalano RF, Hawkins JD, Berglund LM, Pollard JA, & Arthur MW (2002). Prevention science and positive youth development: Competitive or cooperative frameworks? *Journal of Adolescent Health*, 31, 230–239.
- Clark TT, Belgrave FZ, & Abell M (2012). The mediating and moderating effects of parent and peer influences upon drug use among African American adolescents. *Journal of Black Psychology*, 38(1), 52–80. doi:10.1177/0095798411403617
- Cheung GW, & Rensvold RB (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9(2), 233–255. doi:10.1207/S15328007SEM0902\_5
- Conduct Problems Prevention Research Group. (2000). Merging universal and indicated prevention programs: The fast track model. *Addictive Behaviors*, 25(6), 913–927. doi:10.1016/S0306-4603(00)00120-9 [PubMed: 11125779]
- Coyle C, Bramham J, Dundon N, Moynihan M, & Carr A (2016). Exploring the positive impact of peers on adolescent substance misuse. *Journal of Child & Adolescent Substance Abuse*, 25(2), 134–143. doi:10.1080/1067828X.2014.896761
- Crick NR, & Dodge KA (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin*, 115(1), 74–101. doi:10.1037/0033-2909.115.1.74
- De Los Reyes A, & Kazdin AE (2005). Informant discrepancies in the assessment of childhood psychopathology: A critical review, theoretical framework, and recommendations for further study. *Psychological Bulletin*, 131(4), 483–509. doi:10.1037/0033-2909.131.4.483 [PubMed: 16060799]
- Eccles JS (2008). Agency and structure in human development. *Research in Human Development*, 5(4), 231–243. doi:10.1080/15427600802493973 [PubMed: 19526068]
- Eisenberg N, Fabes RA, & Spinrad TL (2006). Prosocial development. In Eisenberg N, Damon W, & Lerner RM (Eds.), *Handbook of child psychology: Vol. 3, Social, emotional, and personality development* (6th ed., pp. 646–718). Hoboken, NJ: Wiley.
- Elliott SN, Gresham FM (2008). *Social Skills Improvement System: Intervention guide*. Minneapolis, MN: Pearson Assessments.
- Embretson SE, & Reise SP (2000). *Item response theory for psychologists*. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Faris R, & Felmler D (2011). Status struggles: Network centrality and gender segregation in same- and cross-gender aggression. *American Sociological Review*, 76(1), 48–73. doi:10.1177/0003122410396196
- Farrell AD, Henry DB, Mays SA, & Schoeny ME (2011). Parents as moderators of the impact of school norms and peer influences on aggression in middle school students. *Child Development*, 82(1), 146–161. doi:10.1111/j.1467-8624.2010.01546.x [PubMed: 21291434]
- Farrell AD, Mays S, Bettencourt A, Erwin EH, Vulin-Reynolds M, & Allison KW (2010). Environmental influences on fighting versus nonviolent behavior in peer situations: A qualitative study with urban African American adolescents. *American Journal of Community Psychology*, 46(1–2), 19–35. doi:10.1007/s10464-010-9331-z [PubMed: 20526663]

- Farrell AD, Mehari KR, Kramer-Kuhn A, Mays SA, & Sullivan TN (2015). A qualitative analysis of factors influencing middle school students' use of skills taught by a violence prevention curriculum. *Journal of School Psychology, 53*(3), 179–194. doi:10.1016/j.jsp.2015.03.001 [PubMed: 26054813]
- Farrell AD, Sullivan TN, Gony EA, & Le AH (2016). Assessment of adolescents' victimization, aggression, and problem behaviors: Evaluation of the problem behavior frequency scale. *Psychological Assessment, 28*(6), 702–714. doi:10.1037/pas0000225 [PubMed: 26372261]
- Farrell AD, & Vulin-Reynolds M (2007). Violent behavior and the science of prevention. In Flannery DJ, Vazsonyi AT & Waldman ID (Eds.), *The Cambridge handbook of violent behavior and aggression* (pp. 767–786). New York, NY, US: Cambridge University Press.
- Fraley RC, Waller NG, & Brennan KA (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology, 78*(2), 350–365. doi:10.1037/0022-3514.78.2.350 [PubMed: 10707340]
- Galambos NL (2004). Gender and gender role development in adolescence. In Lerner RML (Ed.), *Handbook of Adolescent Psychology* (pp. 233–262). Hoboken, NJ, US: John Wiley & Sons.
- Gottfredson MR, & Hirschi T (1990). *A general theory of crime*. Stanford, California: Stanford University Press.
- Hay C, Wang X, Ciaravolo E, & Meldrum RC (2015). Inside the black box: Identifying the variables that mediate the effects of an experimental intervention for adolescents. *Crime & Delinquency, 61*(2), 243–270. doi:10.1177/0011128711398030
- Haynie DL (2002). Friendship networks and delinquency: The relative nature of peer delinquency. *Journal of Quantitative Criminology, 18*(2), 99–134. doi:10.1023/A:1015227414929
- Henry D, Guerra N, Huesmann R, Tolan P, VanAcker R, & Eron L (2000). Normative influences on aggression in urban elementary school classrooms. *American Journal of Community Psychology, 28*(1), 59–81. doi:10.1023/A:1005142429725 [PubMed: 10824274]
- Hill JP, & Lynch MW (1983). The intensification of gender-related role expectations during early adolescence. In Brooks-Gunn J & Petersen AC (Eds.), *Girls at puberty: Biological and psychosocial perspectives* (pp. 201–228). New York: Plenum Press.
- Lipsey MW, & Derzon JH (1998). Predictors of violent or serious delinquency in adolescence and early adulthood: A synthesis of longitudinal research. In Loeber D R, Farrington P (Ed.), *Serious and violent juvenile offenders: risk factors and successful interventions*, (pp. 86–105). Thousand Oaks, CA, US: Sage Publications.
- Marks G, & Miller N (1987). Ten years of research on the false-consensus effect: An empirical and theoretical review. *Psychological Bulletin, 102*(1), 72–90. doi:10.1037/0033-2909.102.1.72
- McCord J, Widom CS, and Crowell NA, eds. (2001). *Juvenile Crime, Juvenile Justice. Panel on Juvenile Crime: Prevention, Treatment, and Control*. Washington, DC: National Academy Press.
- Meter DJ, Casper DM, & Card NA (2015). Perceptions of intimacy and friendship reciprocity moderate peer influence on aggression. *Aggressive Behavior, 41*(5), 432–442. doi:10.1002/ab.21577 [PubMed: 26918432]
- Monahan KC, & Booth-LaForce C (2016). Deflected pathways: Becoming aggressive, socially withdrawn, or prosocial with peers during the transition to adolescence. *Journal of Research on Adolescence, 26*(2), 270–285. doi:10.1111/jora.12190 [PubMed: 27231420]
- Monahan KC, & Steinberg L (2011). Accentuation of individual differences in social competence during the transition to adolescence. *Journal of Research on Adolescence, 21*(3), 576–585. doi:10.1111/j.1532-7795.2010.00705.x [PubMed: 21857776]
- Moretti M, & Odgers C (2002). Aggressive and violent girls: Prevalence, profiles and contributing factors. *NATO Science Series Sub Series I Life and Behavioural Sciences, 324*, 116–129.
- Muthén B, & Asparouhov T (2006). Item response mixture modeling: Application to tobacco dependence criteria. *Addictive Behaviors, 31*(6), 1050–1066. doi:10.1016/j.addbeh.2006.03.026 [PubMed: 16675147]
- Padilla-Walker L, & Carlo G (2007). Personal values as a mediator between parent and peer expectations and adolescent behaviors. *Journal of Family Psychology, 21*(3), 538–541. doi:10.1037/0893-3200.21.3.538 [PubMed: 17874940]



- Polce-Lynch M, Myers BJ, Kliewer W, & Kilmartin C (2001). Adolescent self-esteem and gender: Exploring relations to sexual harassment, body image, media influence, and emotional expression. *Journal of Youth and Adolescence*, 30(2), 225–244. doi:10.1023/A:1010397809136
- Pratt TC, Cullen FT, Sellers CS, Winfree LT Jr, Madensen TD, Daigle LE, ... Gau JM (2010). The empirical status of social learning theory: A meta-analysis. *Justice Quarterly*, 27(6), 765–802. doi: 10.1080/07418820903379610
- Rose AJ, & Rudolph KD (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin*, 132(1), 98–131. doi:10.1037/0033-2909.132.1.98 [PubMed: 16435959]
- Sandstrom M, Makover H, & Bartini M (2013). Social context of bullying: Do misperceptions of group norms influence children's responses to witnessed episodes? *Social Influence*, 8(2–3), 196–215. doi:10.1080/15534510.2011.651302
- Santor DA, Messervey D, & Kusumakar V (2000). Measuring peer pressure, popularity, and conformity in adolescent boys and girls: Predicting school performance, sexual attitudes and substance abuse. *Journal of Youth and Adolescence*, 29, 163–182. doi: 10.1023/A:1005152515264
- Sentse M, Kretschmer T, & Salmivalli C (2015). The longitudinal interplay between bullying, victimization, and social status: Age-related and gender differences. *Social Development*, 24(3), 659–677. doi:10.1111/sode.12115
- Stoltz S, Cillessen AHN, van d. B., & Gommans R. (2016). Popularity differentially predicts reactive and proactive aggression in early adolescence. *Aggressive Behavior*, 42(1), 29–40. doi:10.1002/ab.21603 [PubMed: 26299476]
- Sullivan CJ (2006). Early adolescent delinquency assessing the role of childhood problems, family environment, and peer pressure. *Youth Violence and Juvenile Justice*, 4(4), 291–313. doi: 10.1177/1541204006292656
- Sumter SR, Bokhorst CL, Steinberg L, & Westenberg PM (2009). The developmental pattern of resistance to peer influence in adolescence: Will the teenager ever be able to resist? *Journal of Adolescence*, 32(4), 1009–1021. doi:10.1016/j.adolescence.2008.08.010 [PubMed: 18992936]
- Tomeo CA, Field AE, Berkey CS, Colditz GA, & Frazier AL (1999). Weight concerns, weight control behaviors, and smoking initiation. *Pediatrics*, 104(4), 918–924. [PubMed: 10506235]
- van Rijsewijk L, Dijkstra JK, Pattiselanno K, Steglich C, & Veenstra R (2016). Who helps whom? Investigating the development of adolescent prosocial relationships. *Developmental Psychology*, 52(6), 894–908. doi:10.1037/dev0000106 [PubMed: 27228450]
- Wang C, Hipp JR, Butts CT, Jose R, & Lakon CM (2016). Coevolution of adolescent friendship networks and smoking and drinking behaviors with consideration of parental influence. *Psychology of Addictive Behaviors*, 30(3), 312–324. doi:10.1037/adb0000163 [PubMed: 26962975]
- Young JTN, Rebellon CJ, Barnes JC, & Weerman FM (2014). Unpacking the black box of peer similarity in deviance: Understanding the mechanisms linking personal behavior, peer behavior, and perceptions. *Criminology: An Interdisciplinary Journal*, 52(1), 60–86. doi: 10.1111/1745-9125.12029
- Zuffianò A, Alessandri G, Luengo Kanacri BP, Pastorelli C, Milioni M, Ceravolo R, ... Caprara GV. (2014). The relation between prosociality and self-esteem from middle-adolescence to young adulthood. *Personality and Individual Differences*, 63, 24–29. doi:10.1016/j.paid.2014.01.041



**Figure 1.** Correlations of the five peer factors with factors based on student measures of physical aggression, relational aggression, delinquent behavior, substance use and nonviolent intentions, and teacher ratings of adolescents’ physical aggression, nonviolent behavior, and prosocial behavior. Measures are based on student reports except where noted. Error bars represent 95% confidence intervals.

**Table 1**

Fit Indices From Confirmatory Factor Analyses of Competing Models of Each Peer Measure

Model	$\chi^2$	df	RMSEA	CFI	TLI	$\chi^2(1)^a$
Friends' Delinquent and Prosocial Behavior Scale						
One factor	4931.58***	65	.207	.638	.565	
Two factor	412.98***	64	.056	.974	.968	92.03***
Friends' Reactions to Responses in Conflict Situations Scale						
One factor	514.74***	35	.090	.954	.941	
Two factor	256.12***	34	.062	.979	.972	143.82***
Peer Pressure for Fighting Scale						
One factor	27.16**	5	.050	.997	.994	

Note.  $N = 1,787$ .

RMSEA = Root mean square error of approximation. CFI = comparative fit index. TLI = Tucker-Lewis fit index.

<sup>a</sup> Difference in fit between the two-factor and one-factor models.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**Table 2**

Fit indices for Models Inclusive of All Peer Factors and Models of Relations Between Peer Factors and Concurrent Measures

Model	$\chi^2$	df	RMSEA	CFI	TLI	$\chi^2^a$	df <sup>a</sup>
Comparison of competing models ( $N = 1,787$ )							
1. Five factor	1135.00 <sup>***</sup>	367	.034	.973	.970	1848.51 <sup>***</sup>	9
2. Two factor	9013.91 <sup>***</sup>	376	.113	.700	.676		
Tests of measurement invariance across gender ( $N = 1,787$ )							
3. Configural invariance	1456.12 <sup>***</sup>	734	.033	.974	.971		
4. Scalar invariance	1555.23 <sup>***</sup>	801	.032	.973	.973	125.51 <sup>***</sup>	67
Tests of measurement invariance across grades ( $N = 1,787$ )							
5. Configural invariance	1782.77 <sup>***</sup>	1101	.032	.973	.973		
6. Scalar invariance	1953.72 <sup>***</sup>	1233	.031	.974	.974	224.14 <sup>***</sup>	132
Tests of measurement invariance across intervention condition ( $N = 1,787$ )							
7. Configural invariance	1442.40 <sup>***</sup>	734	.033	.975	.972		
8. Scalar invariance	1512.08 <sup>***</sup>	801	.032	.974	.974	90.94 <sup>*</sup>	67
Relationships between peer factors and concurrent adolescent-report measures ( $N = 1,787$ )							
9. Correlations – full sample	2862.93 <sup>***</sup>	1439	.023	.966	.964		
10. Correlations - by gender	4273.66	3018	.022	.967	.966		
11. Regression model – full sample	3518.15	1643	.025	.957	.954		
12. Regression model - by gender	4786.66	3319	.022	.964	.963		
Relationships between peer factors and concurrent teacher-report measures ( $N = 1,345$ )							
13. Correlations – full sample	1615.19	719	.030	.986	.985		
14. Correlations - by gender	2350.85	1538	.028	.986	.986		
15. Regression Model– full sample	2205.37	871	.034	.979	.977		
16. Regression model - by gender	2757.50	1766	.029	.983	.983		

Note.  $N = 1,787$  except where noted.

RMSEA = Root mean square error of approximation. CFI = comparative fit index. TLI = Tucker-Lewis fit index.

All models specify five peer factors except where indicated otherwise.

<sup>a</sup>Difference in fit for less constrained model (i.e., five-factor model, configural invariance model) versus more constrained model (two-factor model, scalar invariance model).

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**Table 3**

Correlations Among Peer Factors in Five-Factor Model and Mean Gender and Grade Differences From Multiple Group Models

	Friends' Support for Fighting	Friends' Delinquent Behavior	Peer Pressure for Fighting	Friends' Support for Nonviolence	Friends' Prosocial Behavior
Intercorrelations among peer factors					
Friends' Support for Fighting					
Friends' Delinquent Behavior	.42 <sup>***</sup>				
Peer Pressure for Fighting	.28 <sup>***</sup>	.51 <sup>***</sup>			
Friends' Support for Nonviolence	-.83 <sup>***</sup>	-.43 <sup>***</sup>	-.25 <sup>***</sup>		
Friends' Prosocial Behavior	-.38 <sup>***</sup>	-.03	.06	.44 <sup>***</sup>	
Mean differences (d-coefficients) from multiple group models					
Boys – Girls	0.21 <sup>***</sup>	0.04	-0.12	-0.44 <sup>***</sup>	-0.35 <sup>***</sup>
7th grade – 6th grade students	0.17 <sup>*</sup>	0.44 <sup>*</sup>	-0.15	-0.19 <sup>*</sup>	-0.19 <sup>**</sup>
8th grade – 6th grade students	0.27 <sup>***</sup>	0.84 <sup>***</sup>	-0.14	-0.36 <sup>***</sup>	-0.16 <sup>*</sup>

Note.  $N = 1,789$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**Table 4** Summary of Regression Analyses of Peer Measures (rows) as Predictors of Measures of Problem Behavior and Prosocial Behavior (columns)

	Student Report Measures (N = 1,792)					Teacher Report Measures (N = 1,345)		
	Physical Aggression	Relational Aggression	Delinquent Behavior	Substance Use	Nonviolent Intentions	Physical Aggression	Prosocial Behavior	
Friends' Delinquent Behavior	.35***	.34***	.56***	.55***	.06	-.05	-.09	
Friends' Prosocial Behavior	-.02	-.06	-.04	-.15***	.38***	-.15**	.11**	
Friends' Support for Fighting	.07*	.02	-.03	-.05	<i>a</i>	.06	<i>a</i>	
Friends' Support for Nonviolence	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	.16***	<i>a</i>	.01	
Peer Pressure for Fighting	.42***	.49***	.30***	.22***	-.08	.23***	-.08	
Intervention condition	-.04	-.04	-.01	.00	-.03	-.12***	-.11***	
Male gender	-.06*	-.11***	.13***	.01	-.21***	.11***	-.21***	
Grade is 7	.05	-.12**	.03	.12**	-.02	-.01	-.04	
Grade is 8	.05	-.14***	.01	.17***	-.02	.03	.08*	
R <sup>2</sup> based on just covariates	.01	.03**	.02	.02*	.04***	.03***	.07***	
R <sup>2</sup> full model	.51***	.57***	.58***	.48***	.27***	.10***	.10***	

Note. Values are standardized regression coefficients except where noted. Teacher ratings based on a reduced sample because teacher ratings were not collected for the summer wave.

<sup>a</sup>Not included in model due to high correlation between Friends' Support for Fighting and Friends' Support for Nonviolence.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .