

VARIABILITY IN ANTISOCIAL AND PROSOCIAL BEHAVIORS IN EARLY
ADOLESCENCE:
CONTRIBUTIONS OF PEER BEHAVIOR AND PERCEPTIONS OF ADULT AND PEER
FEEDBACK

by

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Abstract

The present study identifies processes contributing to variability in antisocial and prosocial behaviors in early adolescence. More specifically, we considered how perceived feedback from adults (i.e., adult praise) and peers (i.e., coolness) might account for some of the established associations between peer involvement in prosocial behaviors and an individual's engagement in prosocial and antisocial behaviors in the school context. Both adult praise and peer prosocial behavior are tested as predictors of school engagement and antisocial behavior in schools, with perceived feedback from peers (i.e., coolness) examined as both a mediator and moderator using multilevel analysis (MLM) in a statewide sub-sample ($N=6,525$) of 8th grade Middle School/Junior High students located in Southwestern United States. Results testing mediation indicate a significantly positive association between reports of peer prosocial behavior and individual's own involvement in prosocial behaviors, and a significantly inverse association between reports of peer prosocial behavior and individual's own antisocial behaviors. Perceived feedback from peers (i.e., coolness) only partially accounted for these associations. Conversely, results testing moderation indicated a significantly positive link between perceived feedback from adults (i.e., adult praise) and individual's own engagement in prosocial behaviors, and an inverse association between perceived feedback from adults (i.e., adult praise) and individual's own antisocial behaviors. No interaction effects were observed for perceived feedback from peers (i.e., coolness) on these associations. These findings extend literature regarding the processes through which peer involvement in prosocial behavior is linked to individual prosocial and antisocial behaviors. This study makes research advancements by considering the contributions of perceived feedback from both adults and peers that can both be significant during early adolescence. These results justify implications for practice and policy related to prevention/intervention efforts that include peer associations, since they matter for prosocial behavior.

Keywords: Prosocial behavior, antisocial behavior, adult praise, peer associations, evolutionary psychology, intervention, school engagement

Variability in Antisocial and Prosocial Behaviors in Early Adolescence: Contributions of Peer Behavior and Perceptions of Adult and Peer Feedback

A major aim of families, practitioners, scholars, and policymakers centers on the identification of early predictors of antisocial behaviors and the establishment of effective strategies to intervene, with the goal of developing prosocial behavior patterns. Previous studies found that early appearing antisocial behaviors were the single best predictor of delinquency in adolescence, gang membership, and adult incarceration (Dishion, French, & Patterson, 1995; Reid, 1993). Children who grew into adolescence with antisocial behaviors were likely to drop out of school, be arrested, abuse drugs and alcohol, have marginalized adult lives, and die young (Lipsey & Derzon, 1998; Walker, Colvin, & Ramsey, 1995). Furthermore, when students display antisocial behaviors, such as classroom disruption, chronic noncompliance, disrespect toward authority, and aggression, they experience impaired academic and social progress and had diminishing overall success (August, Realmuto, Hektner, & Bloomquist, 2001; Kam, Greenberg, & Kusché, 2004; Larkin & Thyer, 1999).

The social environment of early adolescents is different from that of the child or the later adolescent. Research suggests that social relationships with parents are transformed as adolescents are no longer treated as children, but neither as adults as they acquire greater independence (Silverberg & Steinberg, 1990; Larson & Richards, 1991; Steinberg & Sheffield Morris, 2001). Confronted with biological changes, friends and other peers become more intimate and supportive, and peers become more important in decision-making (Berndt, 1992; Larson, Richards, Moneta, Holm-beck, & Duckett, 1996). Empirical evidence has consistently shown that peers are a powerful source of influence in adolescence (see Brechwald & Prinstein, 2011; Veenstra, Dijkstra, Steglich, & Van Zalk, 2013). Although research has found an increase in

observed risk-taking behavior by the mere presence of peers (Chein, Albert, O'Brien, Uchert, & Steinberg, 2011; Gardner & Steinberg, 2005). Research by van Hoorn, van Dijk, Meuwese, Rieffe, and Crone (2014) found that changes in prosocial behavior depended on the behavior that was liked by the peer group. In addition, You (2011) found that students whose friends had high academic value and high academic aspiration increased in their school engagement. Peer academic value and academic aspiration had significant direct effects on student's academic engagement. Thus, individuals can be compelled to act prosocial based on socialization with their close friends and peers. However, scholars debate whether adolescent development is likely to be influenced more by the actual attitudes or behaviors of peers or perceptions of these peer characteristics (Brown & Larsen, 2009).

In light of these findings, it is important to identify processes that may lead to antisocial and prosocial behaviors. Adult praise was found to increase prosocial behaviors (i.e., compliance and engagement) and decrease antisocial behaviors among children in early- and middle-childhood and for early adolescents (Fullerton, Conroy, & Correa, 2009; Stormont, Smith, & Lewis, 2007). In addition to adults, peers were also found to influence prosocial behavior. Adolescents with prosocial peers are more likely to enact prosocial behavior themselves. For example, Wentzel, McNamara, and Caldwell (2004) showed that children's prosociality is influenced by close friends, and the better the affective quality of the friendship, the more influential friends are on each other's prosocial behavior. Additionally, Barry and Wentzel (2006) found associations between 9th graders close friend's prosocial behaviors and their own, with effects carrying over one year later. During early adolescence and subsequent years, the boost in prosocial behavior has been attributed to increased cognitive development in regards to empathy and perspective-taking (Eisenberg, Fabes, & Spinard, 2006).

Interactions with peers is an important developmental influence during adolescence. Contagion effects were discovered among adolescents already involved in risky behaviors in childhood who were found to be most likely to contribute to antisocial behavior to their peers through peer influence processes in early adolescence (Scott, 2008; Veenstra & Dijkstra, 2011; Benson & Buehler, 2012). Research overwhelmingly finds that antisocial behavior patterns, including violence, drug/substance use, and school related behavior problems are present among adolescents of all cultures, ethnicities, and communities (Sexton, Gilman, & Johnson-Erickson, 2005). However, there remains considerable variability in respect to the manifestation of antisocial behavior in early adolescence and how antisocial behavior is influenced by peer behavior and adult/parenting social interactions during this particular age (Spear, 2000). Peer behavior and adult/parenting social interactions in some cases were found to facilitate antisocial behavior peaking in early- to mid-adolescence (Berndt, 1979). This study will extend the literature regarding processes and mechanisms associated with prosocial influences and antisocial behavior outcomes during early adolescence.

Furthermore, examinations into the contributions of peer behavior and perceptions of adult and peer feedback on variability in antisocial and prosocial behaviors in early adolescence motivates this study. We analyzed a statewide sub-sample obtained from the Arizona Youth Survey (AYS) regarding early adolescents who are at risk for problem behaviors (Arizona Criminal Justice Commission & Bach Harrison, L.L.C., 2012). Biennial data obtained in 2012 showed that students' responses on several scales such as Perceived Availability of Drugs, Family Conflict, Family History of Antisocial Behavior, Friends' Use of Drugs, and Rewards for Antisocial Behavior are above the 2012 national Bach Harrison (BH) Norm, when compared to eight other states. The BH Norm is comprised of responses to the same survey questions used in

the Arizona Youth Survey but administered in a variety of other states to create a benchmark of responses for comparative purposes. The states upon which the BH Norm is based include Arkansas, Louisiana, Michigan, Montana, Nebraska, New York, Oklahoma, and Utah. The results of these comparative data indicate that youth in Arizona are at disproportionately high risk for experiencing a variety of antisocial outcomes.

Further, a review of the risk factor scores in Arizona between the 2010 and 2012 administration of the AYS revealed a significant increase in five risk factor scores including, Perceived Availability of Handguns, Parental Attitudes Favorable to Drug Use, Low Commitment to School, Perceived Risk of Drug Use, and Peer/Individual Rewards for Antisocial Behavior. Understanding the magnitude of early adolescent engagement in risky behaviors is important to wider audiences because early adolescent engagement in antisocial behavior and undesired outcomes represents a key marker of future maladjustment (Reid & Eddy, 1997; Reid, Patterson & Snyder, 2002), that may have a variety of negative consequences on individuals and society in the United States.

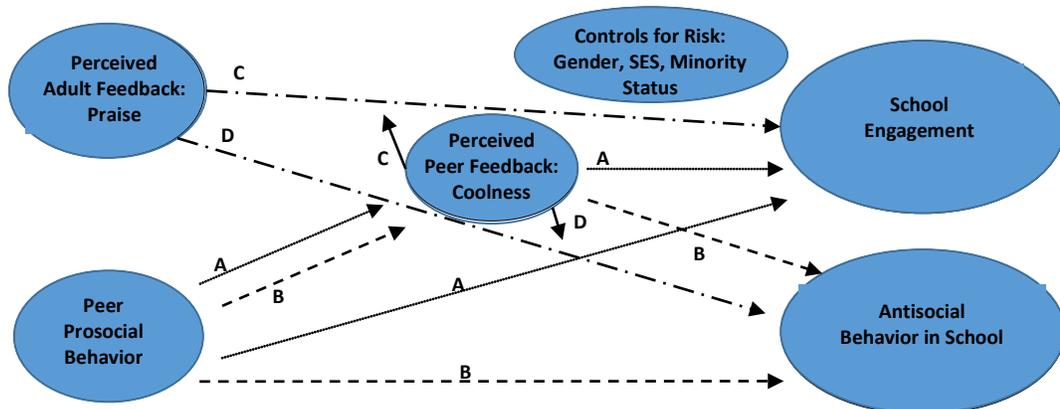
Antisocial Behavior Patterns

Antisocial behavior patterns (e.g. involvement in aggressive or delinquent behavior) often begin to increase during early adolescence and may contribute to adjustment problems during adolescence and into adulthood, such as decreased educational attainment, sporadic acts of school violence, persistently high rates of school dropout and drug use, and increases in poverty (Annie E. Casey Foundation, 2010; Centers for Disease Control and Prevention, 2008a; French & Conrad, 2005; Johnston, O'Malley, Bachman, & Schulenberg 2010, McCord, 1997). Antisocial behavior patterns pose substantial costs to society in the resulting crime, incarceration, reduced job productivity, prevention, and treatment efforts that arise when antisocial behavior patterns are

not identified early, successfully redirected, and/or treated (Cohen, 1998).

At a proximal level, antisocial behavior can be seen in early adolescents' engagement in risky and undesired behavior in school. At a distal level, these early adolescent behavior patterns may result in outcomes with long-term negative effects on the mental health and well-being of early adolescents themselves, relationships with families and loved ones, relationships with peers and teachers in schools, and others in the communities in which they thrive. Studies exist to date which demonstrate parents, siblings, and peers to be the main environmental causes of antisocial behavior (Patterson, Reid, & Dishion, 1992) and the long-term outcomes for children and early adolescents who engage in antisocial behavior, particularly those who arrive to certain school settings with antisocial behavior already developed (Reid, Patterson, & Snyder, 2002).

Additionally, a vast literature exists on the influences of peer perceptions and attitudes on delinquency (Carson, 2013), but no studies have examined the contribution of a specific type of individual perception of peer feedback (i.e., being seen as "cool" by peers for engaging in prosocial behaviors) toward adolescents' antisocial behaviors in the school context. The proposed project will examine the influences of this specific perceived feedback from peers (i.e., coolness) on the linkages between peer behavior and perceived feedback from adults (i.e., adult praise), and school engagement and antisocial behavior in early adolescence (see conceptual model below).



Prosocial Behavior

Although social and material goals such as social status and acceptance, as well as, food and safety were found to be achieved in groups through risky and antisocial means such as theft, bullying, trickery, or threatening harm (Ellis, Del Giudice, Dishion, Figueredo, Gray, Griskevicius, Hawley, Jacobs, James, Volk & Wilson, 2012), they were also found to be achieved in groups by prosocial means such as participating in friendly relationship-building cooperation and reciprocation (Hawley, 1999). Previous studies define prosocial behavior to include voluntary behavior that is aimed at fulfilling another person's need for support (Bar-Tal, 1984; Eisenberg & Fabes, 1998). A systematic review of sociometric status by Newcomb, Bukowski and Pattee (1993) found that behavioral skills consisting primarily of socially skilled behaviors lead to positive social outcomes, that prosocial behavior facilitated and enhanced rather than undermined the goals of peers, and that low levels of disruptive aggression coupled with higher levels of positive traits, actions, and problem-solving skills make for better friends. Furthermore, findings did not address the processes of such influences (Brown & Larson, 2009). Thus, studies of prosocial behavior continue to include voluntary behavior that benefits others or promotes harmonious relations with others (Carlo & Randall, 2001; Eisenberg, Fabes, & Spinrad, 2006).

The social competencies developed from early childhood into adolescence include characteristics such as prosocial behavior (i.e., friendly, cooperative, helpful behaviors and self-control) or regulatory skills (i.e., anger management, negotiation skills, problem solving). A key emphasis of early adolescence is the development of the capacity to regulate one's emotions and behavior, which during adolescence represents a shift from vulnerability to social competence (Shonkoff & Phillips, 2000; Hair, Jager & Garrett, 2001). Early adolescence marks the onset of a period of substantial developmental change affecting the complexity of skills and behaviors

contributing to social competence and prosocial engagement interactions (e.g., Ellis et al., 2012; Gardner & Steinberg, 2005; Scott, 1992; Steinberg, Graham, O'Brien, Woolard, Cauffman, & Banich, 2009). Thus, in order to understand the processes that contribute to variability in prosocial and antisocial behavior for early adolescents, the current study will examine the contributions of perceptions of feedback from peers, on the independent influences of a) perceptions of feedback from adults and b) peer behavior on school engagement and antisocial behavior in school.

Although some previous research has placed particular emphasis on further understanding the dynamic of adults and peers on socialization in early adolescence (see Veenstra, Lindenberg, Oldehinkel, De Winter, Verhulst, & Ormel, 2008), specifics regarding both the mediation and moderation effects of peer associations (i.e., perceptions of peer feedback, peer behavior) can elucidate important mechanisms fostering prosocial behavior that have been largely overlooked. Given the scarcity of research on the influence of perceptions of peer feedback, knowledge resulting from this project addresses a significant scientific gap.

Theoretical Frameworks

Social Development Model – Risk & Protective Factors

The social development model (Catalano & Hawkins, 1996) explains that individuals adopt the beliefs and values of the social unit to which they are bonded (e.g., prosocial or antisocial behavior). Whether an individual behaves in a prosocial or antisocial manner is directly influenced by the behaviors, beliefs, and values of the social unit that is of greatest importance to the individual. A social unit can be an individual, family, school, peer, a neighborhood, or an entire community. As previously stated, peers in addition to adults become the dominant social associations during early adolescence (Kandel & Andrews, 1987; Rose, Boush, & Friestad, 1998; Windle, 2000; Wood, Vinson & Sher, 2001)

In extension, public health frameworks for understanding and preventing problems in childhood through adolescence tend to emphasize addressing risk factors that may hinder positive outcomes (Hawkins, Catalano, & Miller, 1992; Biglan, Brennan, Foster, & Holder, 2004; Hawkins, 2006). Broadly defined, the term “risk factor” was previously used to identify substance abuse and delinquency in prevention science (e.g., Hawkins, Jenson, Catalano, & Lishner, 1988). However, current practice explains that risk factors pertain to any event, condition, or experience that increases the probability that a problem will be formed, maintained, or exacerbated (Fraser & Terzian, 2005). Thus, a focus on interactive processes may lead to uncovering the moderating and mediating effects of underscored conditions that promote the development of individual prosocial and antisocial behavior. This study extends the research with populations exposed to multiple risks by examining interactive processes (i.e., risk and protective factors) that include contributions of peer associations, including peer feedback that proceed a positive or negative outcome (e.g., Fraser, Kirby, & Smokowski, 2004; Herrenkohl, Chung & Catalano, 2004); controlling for individual-level risk factors such as gender, free and reduced lunch rates, and minority status.

In spite of such risk factors, prosocial engagement in socially desired activities, perceptions of children and adolescents, aspects of their families, and characteristics of their wider social environments, help some children and adolescents to not engage in problem behaviors and prevail over adversities (Rutter, 1979; Werner & Smith, 1982, 1992; Masten & Garmezy, 1985). Conversely, the term “protective factor” is related to the particular interactions among conditions that produce an enduring shield or resilience in the face of risk for negative outcomes (Rutter, 1985). The current concept of protective factors emphasizes individual or environmental resources that buffer associations with risk (Fraser & Terzian, 2005). Therefore, this study employs the concept of protective factors to include peer association influences involving prosocial behavior,

perceptions of peer and adult feedback regarding individual involvement in prosocial behavior, and individual engagement in prosocial school sponsored activities. Specifically, influences such as adult praise and peer behavior could potentially elucidate a chain of risk and protective factors. Further, individual perceptions of peer feedback may also influence the pathways in which early adolescents experience prosocial and antisocial outcomes in school. Thus, this study coincides with and extends the ongoing focus on risk and protective factors as a unifying descriptive framework for identifying key interactive processes that affect early adolescent school engagement and antisocial behavior in school.

Social Development and School Engagement

Schools, like families and communities, are considered important mechanisms of socialization during childhood and early adolescence. Many early adolescents begin to think abstractly about their futures (Nurmi, 1991; Piaget, 1972), engage in more intense social relationships (Montgomery, 2005), and contribute positively to their own lives and those of their peers, family, and communities (Lerner, Dowling, & Anderson, 2003; Search Institute, 2006). Furthermore, early adolescents are defining their self-concept with regard to family relationships, peer relationships, academic performance, and many other areas (Schwartz, 2008). Schools generate developmental strengths for students by linking family, peers, community, and other resource systems and drawing them into learning and networks of support, and by strengthening academic achievement and necessary developmental and social outcomes (see Benson, 2002).

In a number of studies, student engagement has been identified as a desirable trait in schools (Willms, Friesen, & Milton, 2009; Silver & Perini, 2010). Students who are engaged show sustained behavioral involvement in learning activities accompanied by positive (prosocial) behaviors such as initiating action when given the opportunity, and exerting effort and

concentration in the implementation of learning tasks; they show generally positive emotions during ongoing actions, including enthusiasm, optimism, curiosity, and interest (Skinner & Belmont, 1993). Research on service-learning suggests that opportunities for prosocial engagement that combine early adolescents' efforts with their peers around issues of leadership, responsibility, equity, and empathy may work as a protective factor for them during this risky developmental stage (Richards, Sanderson, Celio, Grant, Choi, George, & Deane, 2013). On the other hand, indicators of the absence of student engagement include antisocial behaviors such as unexcused absences from classes, cheating on tests, and damaging school property (Chapman, 2003), and withdrawal from learning opportunities or even antisocial behavior towards teachers and peers (Skinner & Belmont, 1993). Early adolescents involved in school-sponsored activities tend to have higher levels of trust and more positive views of others in their communities than those not involved in such activities (Flanagan, Gill, & Gallay, 2005).

Evolutionary Perspective – Resource Control Theory

Resource control theory (Hawley, 1999), with roots in the work of human ethologists (e.g., Abramovitch, 1976; McGrew, 1972; Strayer and Strayer, 1976) and animal behaviorists (e.g., Bernstein, 1981; Chance, 1967; Rowell, 1974), is an evolutionary developmental theory of social dominance that is concerned with individual differences in behavior and personality, and considers the developing child to be responsive to key social and material cues in what is essentially a competitive environment. This view is concerned with the extent to which individuals successfully access social, material, or informational resources relative to others. In line with this perspective, obtaining status and biological needs (e.g., acquiring resources) is mediated through the association with others (Geist, 1978; Trivers, 1971). In this view, theoretical roots of prosocial behavior lie in the evolution of cooperation and reciprocation (e.g.,

Trivers, 1971; Charlesworth, 1996), where multiple interactions and coordinating efforts with others can influence the development of prosocial behavior. Therefore, the goal is to obtain positive or rewarding attention from high status others (social), objects meeting one's survival needs and denoting status (material; e.g., food, clothing; Sahlins, 1963; van Vugt & Hardy, 2010), and valuable information regarding work, school projects, or events (informational; e.g., Hawley, Shorey, & Alderman, 2009; Keltner, Gruenfeld, & Anderson, 2003). Thus, this study extends Hawley's (2014) findings that meeting one's needs or successfully competing for resources can be achieved through direct associations with others by considering also the indirect effects of perceived feedback from peers on prosocial and antisocial behavior.

Evolutionary Perspectives on Early Adolescent Behavioral Development

Early adolescence constitutes a distinct and important stage of development in which strategies to leverage status and access to mates contributes to vulnerability and the onset of risky behaviors that can negatively affect desired outcomes in school, such as the development of antisocial behaviors (e.g., skipping school, school fights, drug/substance, and handguns use on school property). The stage-specific processes that can influence early adolescent development and behavior include the pursuit of personal identity, sexual reproduction, affective changes, establishment of independent values from those of the family, need for peer group acceptance and status, and emphasis on the functional role of negotiating social competencies and interpersonal relationships (Ellis et al., 2012). Compared to individuals at other ages, early adolescents exhibit a disproportionate amount of risk-taking (Trimpop, Kerr, & Kirkcaldy, 1999). For example, previous studies found that early adolescents are more impulsive, seek exciting and dangerous experiences, prefer immediate rewards to delayed gratification, choose to ignore risks in some contexts, discount consequences, succumb to negative peer and adverse influences, increased

likelihood of causing self-harm and to others (Arnett, 1992; Maggs, Almeida, & Galambos, 1995; Wilson & Daly, 1985; Barbot & Hunter, 2012; Galvan, Hare, Parra, Voss, Glover, & Casey, 2007). A recent study found participants 15 years of age and younger to act more impulsively than older adolescents, but even 16- and 17-year-old youth failed to exhibit adult levels of self-control (Feld, 2008).

An important function of early adolescence is the onset of the adolescents' positioning of him/herself in a social context to be attractive to peers, as they initiate the process of pulling away from adult supervision and engaging in reinforcing activities with peers (Dishion, Ha, & Véronneau, 2012). Thus, both adult praise and peer behaviors are important influences on early adolescent behavior. Navigating social relationships and positioning oneself advantageously in a given social niche involves potential for risky behavior and antisocial outcomes; as a systematic review of the antisocial literature found "actual rates of illegal behavior soar(ing) so high during adolescence that participation in delinquency appears to be a normal part of teen life" (Moffitt, 1993, p. 675).

Understanding the interactional processes that may lead to prosocial and antisocial behaviors in early adolescence is complex due to important stage-related evolutionary processes between the developing individual and his/her environments. Increases in the value attributed to peer conformity and social interactions during early adolescence may provide the opportunity to explore new behaviors, situations, reinforcers, and promote independence (Spear, 2000). Furthermore, as the parent-child relationship maintains its importance in early adolescents, information about parent influences can help establish support to cope with these adaptational demands successfully (Moretti & Peled, 2004). Such explanations embedded in evolutionary-based functional behavior will focus on the influence of perceptions of adult and peer feedback

that contribute to the understanding of processes and potential strategies that promote individual success in school by emphasizing the mechanisms through which early adolescents build important social competencies.

Objectives & Hypotheses

Integrating insights from developmental, evolution, and prevention science, the results obtained from this specific geographical sample concern a wider scientific audience. In the present study, mediation models are explored to better understand the influence of youth's perceived peer feedback (i.e., coolness) on the relationship between the number of friends youth reported engaged in prosocial behavior acts and youth's own school engagement and antisocial behavior in school (see Figure 1). A separate moderation model involving interactions or moderator effects in which youth's perceived peer feedback (i.e., coolness) would influence the impact of adult (parent/teacher) praise on youth's school engagement and antisocial behavior in school (see Figure 2).

Both mediation and moderation models were computed controlling for gender, free and reduced lunch rates, and race/ethnicity because these factors have been shown to have an influence on school engagement and antisocial behavior. For example, research showed that from about four years of age onwards, boys are more likely than girls to engage in both aggressive and nonaggressive antisocial behavior (Keenan & Shaw, 1997; Lahey, Schwab-Stone, Goodman, Rathouz, Miller, Canino, Bird, Jensen & Waldman, 1998; Poulin, Cillessen, Hubbard, Coie, Dodge, & Schwarts, 1997; Tremblay, Boulerice, Harden McDuff, Perusse, Pihl & Zoccolillo, 1996). Low socioeconomic status, whether measured at the individual or school-level, has been associated with an increased risk of antisocial behavior (Christle, Nelson, & Jolivette, 2004). In general, studies have used student eligibility for free or reduced-cost lunch as a measure of

poverty, often finding that increased program enrollment corresponds with higher suspension rates (Mendez, Knoff, & Ferron, 2002; Skiba, Michael, Nardo, & Peterson, 2002). For nearly four decades, research has shown a consistent racial disparity between minority and white students in school discipline, including office referrals, corporal punishment, suspensions, and expulsions (Gregory, 1995; Rocque, 2010; Skiba, Michael, & Nardo, 2000; Skiba, et al., 2002;).

In addition, prior research shows that youth who have friends who engage in prosocial behavior acts are more likely to be involved in school engagement and less likely to be involved in antisocial behavior in school (Berndt & Keefe, 1995; Garcia-Reid, 2007). This study extends prior research by analyzing two separate models predicting whether the relationships between peer prosocial behavior and participants' school engagement, and peer prosocial behavior and antisocial behavior in school is accounted for by the inclusion of individual perceived peer feedback (i.e., coolness). Consequently, controlling for gender, free and reduced lunch rates, and racial/ethnic minority status, the following research questions and hypotheses were tested:

Mediation

Q1a. What are the direct associations among peer prosocial behavior and youth's school engagement?

H1a. Youth who have more peers engaged in prosocial behavior will report higher school engagement. (see Figure 1, Model A)

Q1b. What are the direct associations among peer prosocial behavior and youth's antisocial behavior in school?

H1b. Youth who have more peers engaged in prosocial behavior will report lower antisocial behavior in school. (see Figure 1, Model B)

Q2a. Is the relationship between peer prosocial behavior and participants' school

engagement mediated through youth's perceived peer feedback (i.e., coolness)?

H2a. Youth who have more peers engaged in prosocial behavior will be positively associated with youth's school engagement via increases in participants' perceived peer feedback (i.e., coolness). (see Figure 1, Model A)

Q2b. Is the relationship between peer prosocial behavior and participants' antisocial behavior acts in school mediated through youth's perceived peer feedback (i.e., coolness)?

H2b. Youth who have more peers engaged in prosocial behavior will be negatively associated with youth's antisocial behavior in school via increases in participants' perceived peer feedback (i.e., coolness). (see Figure 1, Model B)

Moderation

Furthermore, research that examines youth's involvement in school-sponsored activities also identifies adult praise as a key strategy that promotes prosocial school engagement. For example, adult praise (from teachers and parents) is a form of focused attention that has been found to head off antisocial behavior in schools (Mayer & Sulzer-Azaroff, 2002; Wang & Eccles, 2012). This study also examines if the association between adult praise and youth's school engagement, and adult praise and youth's antisocial behavior in school will vary based on the values of individual perceived peer feedback (i.e., coolness). For example, whether the association between adult praise and youth's school engagement will vary based on perceptions of coolness, such that it is the combination of more praise received from adults in addition to more perceptions of coolness from peers for engaging in prosocial behavior that leads to greater school engagement for early adolescents. Also, whether the association between adult praise and youth's antisocial behavior in school will vary based on perceptions of coolness, such that it is the combination of more praise received from adults in addition to more perceptions of coolness that inversely leads

to fewer antisocial behavior in school. After controlling for gender, free and reduced lunch rates, and minority status, the following research questions and hypotheses were tested:

Q3. What are the direct associations between adult praise (teachers and parents), coolness (peers), and youth's school engagement?

H3a. Youth who receive more praise from adults for their prosocial behavior will demonstrate higher school engagement. (see Figure 2)

H3b. Youth who report higher perceptions of coolness from peers for their prosocial behavior will demonstrate higher school engagement. (see Figure 2)

Q4. Do participants' perceptions of peer feedback (i.e., coolness) moderate the association between adult praise and youth's school engagement?

H4a. The association between adult praise and youth's school engagement will vary depending on perceptions of peer feedback (i.e., coolness), such that youth who report more adult praise will also report more perceptions of peer feedback (i.e., coolness) and greater school engagement. (see Figure 2)

Q5. What are the direct associations between adult praise (teachers and parents), coolness (peers), and youth's antisocial behavior in school?

H5a. Youth who receive more praise from adults for their prosocial behavior will demonstrate fewer antisocial behaviors. (see Figure 2)

H5b. Youth who report higher perceptions of coolness from peers for their prosocial behavior will demonstrate fewer antisocial behaviors. (see Figure 2)

Q6. Do participants' perceptions of peer feedback (i.e., coolness) moderate the association between adult praise and youth's antisocial behavior in school?

H6a. The association between adult praise and youth's antisocial behavior in school will

vary depending on perceptions of peer feedback (i.e., coolness), such that youth who report more adult praise will also report more perceptions of peer feedback (i.e., coolness) and fewer antisocial behaviors in school. See Figure 2.

Method

Sample

The data used for this study were gathered from the 2012 Arizona Youth Survey questionnaire (Arizona Criminal Justice Commission). The survey is intended to provide information about the levels of risk and protection in a community as well as levels of substance use and anti-social behaviors of youth. Not all of the target 8, 10, and 12th grade students in Arizona participated in the survey. Some schools did not participate, some students chose not to participate, some parents did not allow their child to participate, and some students were absent on the day the survey was administered. Of the 69,293 students that took the 2012 Arizona Youth Survey, 62,817 8th, 10th, & 12th grade students from all 15 counties and 349 schools comprise the final survey pool for the analysis in this study. The final participant subset obtained for the purpose of this study is comprised of students in 8th grade ($N = 6,525$; see Table 1 for descriptives) who provided valid responses (as determined by the Arizona Criminal Justice Commission).

Participants

Participants included $N = 6,525$ early adolescents (3,944 male, 60%; 2,581 female, 40%) in grade 8 from a statewide subsample of 210 middle school/junior high schools. See Table 1 for sample descriptives. Participants age range was 12 to 16 years ($M=13.74$, $SD=.58$), with the majority of students 14 (60%) and 13 (33%) years-old. These early adolescents had the option to mark more than one ethnic identity, with the following breakdown: 43.8% Caucasian/White; 41.1% Hispanic/Latino; 6.8% American Indian, 5.6% African American/Black; 1.9% Asian; .8%

Hawaiian/Pacific Islander. Also, there was some variability regarding student reported indicators of family socioeconomic status (52% Free Lunch; 11% Reduced Lunch; 37% Paid).

Procedure

The 2012 Arizona Youth Survey was administered between January and April 2012 in Arizona public and charter schools. The statewide effort encompassed all 15 counties and 349 schools, which resulted in the participation of 62,817 6th through 12th grade students throughout Arizona. School principals and teachers were provided detailed instructions for administering the survey. Students' anonymity was emphasized through a teacher-read script, which instructed students not to put their names on the survey. Upon completion, all surveys were returned and electronically scanned by Bach Harrison L.L.C. Furthermore, de-identified data on a sub-sample consisting of 6,525 students in 8th grade were obtained for the purpose of this report.

Measures

The survey questionnaire was originally developed through the combined efforts of six states and the Social Development Research Group at the University of Washington. The collaborative survey development process was a Center for Substance Abuse Prevention (CSAP) funded project called the Six-State Consortium. The goal of the Consortium was to develop a survey that provided scientifically sound information about the levels of risk and protection in a community. The survey was further refined through the Diffusion Consortium Project that involved seven states and was funded by four federal agencies: the National Institute of Drug Abuse (NIDA), Safe and Drug Free Schools Program, Office of Juvenile Justice and Delinquency Prevention, and CSAP. In addition to measuring risk and protective factors, the survey also measures alcohol, tobacco, and other drug (ATOD) use and antisocial behavior. Select measures, as described below, are used in the present study.

Perceptions of adult feedback (i.e., adult praise). The rewards for prosocial involvement (RPI) scale is used to measure student's experiences in community, family, and school contexts. The RPI scales consist of 3 items at the community level, family level, and school level: *My neighbors notice when I am doing a good job and let me know about it, My parents notice when I do a good job and let me know about it, My teachers notice when I am doing a good job and let me know about it.* Responses use a Likert-type scale, ranging from *NO!* (scored as 1) to *YES!* (scored as 4), with higher scores indicating higher perceptions regarding praise from adults. Items were significantly correlated. Items were summed to create a composite measure of adult praise influence ($\alpha = .50$).

Peer prosocial behavior. The interaction with prosocial peers (IPSP) scale is used to measure students' peer interactions in school. The IPSP consists of 3 items about early adolescents' perceptions regarding the prosocial behaviors of their 4 best friends. All three questions were used in this analysis and include: *How many of your 4 best friends have participated in clubs, organizations, or activities at school?, How many of your 4 best friends have tried to do well in school?, and How many of your 4 best friends have liked school?.* Responses use a Likert-type scale, ranging from *0 Friends* (scored as 1) to *4 Friends* (scored as 5), with higher scores indicating higher perceptions of greater involvement in prosocial behaviors by their 4 best friends. Items were significantly correlated. Items were summed to create a composite measure of peer behavior influence ($\alpha = .57$).

Perceptions of peer feedback (i.e., coolness). The rewards for prosocial involvement (RPSI) scale is used to also measure student's perceptions about their peer's attitudes about prosocial behavior in school. The RPSI consists of 3 items about early adolescents' perceptions of peer attitudes regarding rewards for prosocial involvement. Three questions were used in this

analysis and include: *What are the chances you will be seen as cool if you worked hard at school?*, *What are the chances you would be seen as cool if regularly volunteered to do community service?*, and *What are the chances you will be seen as cool if you defended someone who was being verbally abused?*. Responses use a Likert-type scale, ranging from *No or very little chance* (scored as 1) to *Very good chance* (scored as 5), with higher scores indicating higher perceptions of peer attitudes regarding prosocial behavior (i.e., perceptions that prosocial behavior is “cool”). Items were significantly correlated. Items were summed to create a composite measure of perceived benefits of prosocial behavior ($\alpha = .70$).

School engagement. The school-sponsored activities (SSA) scale asks about early adolescents’ self-reported involvement in school-sponsored activities. The RPSI consists of 4 items about early adolescents’ self-reported involvement in school-sponsored activities. Four questions were used in this analysis and include: *Which school-sponsored activities are you involved in during after school hours?* with *Sports, Arts, Clubs, and Volunteering* as options for students to mark as many as apply. Students were asked to indicate their engagement by responding *Yes* (scored as 1) or *No* (scored as 2), with higher scores indicating less school and community engagement. Items were then reverse coded so that more yes responses reflected higher school engagement. Items were significantly correlated. Items were summed to create a composite measure of school engagement ($\alpha = .72$).

Antisocial behavior in school. A series of additional questions measured early adolescents’ antisocial behavior acts and commitment to school. Specifically, 4 items were about early adolescents’ self-reported involvement in antisocial acts at school. Four questions were used in this analysis and include: *During the past 12 months, how many times were you in a physical fight on school property?*, *How many times in the past 12 months have you been suspended from*

school?), *How many times in the past 12 months have you been drunk or high at school?*, and *How many times in the past 12 months have you taken a handgun to school?*. Students were asked to indicate their antisocial behavior acts by responding *0 times* (scored as 1) to *40+ times* (scored as 8), with higher scores indicating higher frequency of antisocial behavior acts. Items were significantly correlated. Items were averaged to create a composite measure of students' self reports of antisocial behavior acts ($\alpha = .61$).

Data Analysis Plan

The goal of this analysis is to identify processes contributing to variability in antisocial and prosocial behaviors in early adolescence. More specifically, we considered how perceived feedback from adults (i.e., adult praise) and peers (i.e., coolness) might account for some of the established associations between peer involvement in prosocial behaviors and an individual's engagement in prosocial and antisocial behaviors in the school context. Since measures of all variables were obtained from early adolescents in state-wide schools, individual students are nested in schools such that individual responses may be influenced by school characteristics. Analyzing data that are nested requires the use of multilevel modeling (MLM) to account for similarities or discrepancies in the responses of students who come from the same schools (see Bauer, Preacher, & Gil, 2006). One way to employ multilevel modeling is to allow the relationships between the variables across students to be 'random' such that each student has his/her own intercept and slope. This is sometimes called a random-effects model. When all variables are measured at the student level (rather than at the school level), and when the effects of interest are at the student-level (rather than the aggregated school level), the model is sometimes referred to as a 1-1-1 model. Multilevel analysis allows for accurate estimation of the person-level effects by appropriately handling the dependencies or similarities among responses from students

in the same school.

Further, each of the following variables in our models were standardized prior to their use in the analyses: perceptions of adult feedback (i.e., adult praise), perceptions of peer feedback (i.e., coolness), school engagement, and antisocial behavior in school. Standardized coefficients or beta coefficients are the estimates resulting from a regression analysis that have been standardized so that the variances of dependent and independent variables are 1. All variables (independent and dependent) were standardized. β s were calculated as $b * [SD-X / SD-Y]$, in which SD-X and SD-Y refer to the standard deviations across all the data (Snijders & Bosker, 1999). We therefore report both un-standardized (b) and standardized beta's (β) for all effect sizes and provide interpretations in terms of the original scale units to give some sense of their magnitude.

Peer prosocial behavior as predictor of school engagement and antisocial behavior

The analysis plan is as follows. We first examined correlations to assess the relationships between peer prosocial behaviors and a) peer attitudes about prosocial behavior; b) school/community engagement; and c) youth antisocial behaviors. The first step to testing in a MLM framework is to compute a null or empty model without predictors, and examine the amount of variance accounted for at the individual and school level. Then, we computed two distinct models with identical independent variables (i.e., adult praise and peer prosocial behavior) while controlling for gender, free and reduced lunch, and race/ethnicity. One model included school engagement as the dependent variable, and another model included youth antisocial behaviors as a dependent variable. A subsequent step was to test a mediation model (see Baron and Kenny, 1986) for students in which participants' perceived peer feedback (i.e., coolness) would mediate the relationship between prosocial influences (i.e., adult praise and peer prosocial behavior) and school engagement, as well as, antisocial behavior acts in school. The variability of

children nested in schools was accounted for by the multilevel model.

To assess for mediation, five regression models were estimated. The first regression had peer prosocial behavior predicting school engagement. The second regression had peer prosocial behavior predicting participants' perceived peer feedback (i.e., coolness). The third regression had peer prosocial behavior and participants' perceived peer feedback (i.e., coolness) predicting school engagement. The fourth regression had peer prosocial behavior predicting antisocial behavior in school. The fifth regression had peer prosocial behavior and participants' perceived peer feedback (i.e., coolness) predicting antisocial behavior in school.

In order for mediation, four conditions must have been met for Model A. First, peer prosocial behavior must have been related to school engagement (path c). Second, peer prosocial behavior must have been related to participants' perceived peer feedback (i.e., coolness) (path a). Third, participants' perceived peer feedback (i.e., coolness) must have remained a significant predictor of school engagement (path b). Fourth, peer prosocial behavior should have no longer significantly predicted school engagement (path c'). If all four conditions were to be met, full mediation would be supported. If only the first three conditions would be met, then partial mediation would be supported. Finally, in a duplicate Model B, adult praise must have no longer significantly predicted antisocial behavior in school. The above procedures were repeated with antisocial behavior in school as the outcome variable in Model B.

Next, to test the hypotheses regarding the moderating role of participants' perceived peer feedback (i.e., coolness), we computed two identical regression models with school engagement and antisocial behaviors as dependent variables. The independent variables included the main effects of adult praise and peer attitudes about prosocial behavior along with an interaction term that represented the product of the standardized values of adult praise and participants' perceived

peer feedback (i.e., coolness). All statistically significant interactions would have been interpreted using standard pick-a-point techniques, which have been validated in multi-level models (Preacher, Curran & Bauer, 2006). Specifically, the simple slopes of the lines defining the associations between the focal independent variable (i.e., adult praise) and school/community engagement, as well as, antisocial behavior at specified levels (i.e., mean, +1 SD above the mean, and -1 SD below the mean) of the moderator variable (i.e., peer attitudes about prosocial behavior) were plotted.

Data Screening & Manipulation

This study made use of secondary data collected using the 2012 wave of the Arizona Youth Survey (Arizona Criminal Justice Commission), a state-wide biennial survey/questionnaire administered to early adolescents and youth in middle schools/junior high and high schools throughout the fifteen Arizona counties. The master SPSS data file consisted of 69,293 observations assigned de-identified school and school district codes. First, we computed variable frequencies and distributions to analyze the master file for missing data and to determine the nature of data missingness. Next, we proceeded by assigning a value of “99” to all missing data prior to analyses. This was done under the assumption that the application of multilevel modeling (MLM) can handle missing data and that missing data is permitted in maximum likelihood estimations using R statistical software. Therefore, we instructed the program to “control for missingness” or “omit” missing data in each syntax command (which will be explained in the following subsample analyses paragraph). Third, to achieve a subsample from the larger SPSS data pool for further R software analyses, we selected only for 8th grade participants. The subsample .CSV file consisted of 6,525 observations.

Then, we proceeded by analyzing the variable frequencies and distributions of the

subsample .CSV data file by constructing a series of histograms to check for univariate and multivariate outliers (see Tabachnick & Fidell, 1996). Fourth, when checking for outliers we focused on case scores that were at the extreme in the variable distribution, since these would have a higher impact on the outcome in subsequent statistical analyses. We concluded the reason outliers were identified was that the missing data codes were not specified in several entries in the subsample data set, that missing data codes were read as case entries when loaded into R software.

Further analysis of key variables revealed the following missingness in our sample: a) Peer Prosocial Behavior (177 cases, 3%), b) Perceived Feedback from Peers (i.e., coolness) (135 cases, .02%), c) School Engagement (225 Cases, 4%), d) Perceived Feedback from Adults (i.e., adult praise) (38 cases, .06%), and e) Antisocial Behavior in School (220 Cases, 3%).

Therefore, we corrected this by re-assigning to all cases “NA” instead to the previously assigned “99” as missing value codes because R software read them as a value entry and outlier, then told the R program that the “NA” were missing values, which we indicated by controlling for missing data or omitting missing data in each syntax command during subsequent mediation and moderation analyses. Fifth, we proceeded to check for normality by examining the distribution of data through histograms and by calculating measures of skewness and kurtosis. Skewness describes how unevenly the data is distributed with a majority of scores piled up on one side of the distribution and a few stragglers off in one tail of the distribution. The rule of the Skewness test is that the default cut-off of the distribution should not be greater than 3.3 (Tabachnick & Fidell, 1996). Further, Kurtosis describes how peaked or flat the distribution is. The rule of the Kurtosis test is that the default value may also not be greater than 3.3. However, as this subsample data set size is large, the more likely is the chance that violations of skewness and kurtosis will yield with just small deviations. Tabachnik & Fidell (1996) suggest an option to use a less conservative

number than a z-score of 3.3, but provide no specified cut off. The following were the original skewness and kurtosis values for the main dependent variables of interest prior to transformations: a) School Engagement (Skew = -0.01; Kurtosis = 3.56), and b) Antisocial Behavior in School (Skew = 4.56; Kurtosis = 31.36). After conducting several transformations, it was determined by the curvature of homoscedasticity (i.e., scores for one dependent continuous variables is roughly the same at all values of another side, while bulging at the middle) and the post transformation scores of a) School Engagement (Skew = 1.71 and Kurtosis = 2.65), and for b) Antisocial Behavior in school (Skew = 1.12; Kurtosis = 2.03) that the best transformation for both continuous dependent variables was the log (x+1) data transformation. We then proceeded to test both mediation and moderation models.

Results

Bivariate Correlations

At the bivariate level (see Table 2), peer prosocial behavior had a statistically significant inverse relationship with participants' antisocial behavior in school. Statistically significant positive relationships were found between peer prosocial behavior and participants' school engagement, as well as peer prosocial behavior and participants' perceived peer feedback (i.e., coolness). A statistically significant inverse association was also found between adult praise and participants' antisocial behavior in school. Also, there was a statistically significant positive relationship between adult praise and participants' school engagement.

Results of Mediation Analyses to Test Hypotheses 1a-2b

According to Baron & Kenny (1986), mediation is tested by computing three separate regression analyses, as previously outlined under the data analysis plan. This entailed conducting three separate equations for each outcome: (a) regressing peer prosocial behavior on participants'

perceived peer feedback (i.e., coolness), (b) regressing participants' perceived peer feedback (i.e., coolness) separately on school engagement and antisocial behavior in school, and (c) regressing participants' perceived peer feedback (i.e., coolness) separately on peer prosocial behavior acts and school engagement and antisocial behavior in school.

A general explanation of mediation describes that the inclusion of a third hypothetical intervening variable changes the relationship between an independent variable and a dependent variable, such that the relationship between an independent variable and dependent variable is accounted for by the inclusion of the mediator. To establish mediation in the context of the present study, peer prosocial behavior had to affect participants' perceived peer feedback (i.e., coolness) in the first equation, participants' perceived peer feedback (i.e., coolness) had to affect school engagement and antisocial behavior in school in the second equations, and participants' perceived peer feedback (i.e., coolness) separately had to effect the association between peer prosocial behavior on school engagement and peer prosocial behavior on antisocial behavior in school in the third equations. More specifically, according to Baron and Kenny (1986), if all three of these conditions were to hold, then mediation would occur if the effect on associations between peer prosocial behavior on school engagement and peer prosocial behavior on antisocial behavior in school was less marked in the third equation than in the second. In this study, two separate multi-level models were analyzed using similar predictor (peer prosocial behavior) and mediator (participants' perceived peer feedback (i.e., coolness) with different outcomes, one for school engagement and another for antisocial behavior in school. All analyses controlled for gender, free and reduced lunch rates, and minority status. The findings will be discussed below (see Table 3 and 4).

School engagement.

Results of the unconditional-means model predicting youth's school engagement indicated systematic nesting of youth's school engagement between schools. The interclass correlation (ICC) indicates that approximately four percent of the observed variance associated with school engagement was explained by between-school level differences. Therefore, most of the variance in school engagement was accounted for by individual-level variables, the focus of the study hypotheses.

In an examination of the first equation (Path A), this model was tested with variables of perceived peer feedback (i.e., coolness) and peer engagement in prosocial behavior, as well as all controls and accounted for a moderate statistically significant portion of the observed variability in school engagement, adjusted $R^2 = .06$, $F(8, 5960) = 55.63$, $p < .001$. It was found that youth who reported more peers engaged in prosocial behavior also reported higher perceptions of peer feedback (i.e., coolness), $b = .150$, $p < .001$, $\beta = .260$. Thus, a one standard deviation change in peer engagement in prosocial behavior predicted a .26-unit increase in perceived peer feedback (i.e., coolness) (a 5.2% change given the five-point scale). In light of this statistically significant relationship, we moved forward to test the next step in mediation. In terms of the second equation (Path B), this model was tested with variables of perceived peer feedback (i.e., coolness) and school engagement, as well as all controls and accounted for a small statistically significant portion of the observed variability in school engagement, adjusted $R^2 = .02$, $F(8, 3228) = 9.48$, $p < .001$. These results indicated that when youth reported higher perceptions of peer feedback (i.e., coolness), they also reported higher school engagement, $b = .020$, $p < .001$, $\beta = .080$. Thus, a one standard deviation change in perceptions of peer feedback (i.e., coolness) predicted a .08-unit increase in school engagement (a 4% change given the two-point scale). Since a statistically significant relationship was found, we proceeded to the third equation. As a test of the third

equation (Path C), this model was tested with variables of participants' reports of peer prosocial behavior and school engagement, as well as all controls, and accounted for a small significant portion of the observed variability in school engagement, adjusted $R^2 = .04$, $F(8, 3129) = 16.23$, $p < .001$. Analyses revealed a statistically significant association between participants' reports of peer prosocial behavior and school engagement, $b = .020$, $p < .001$, $\beta = .150$. Thus, a one standard deviation change in participants' reports of peer prosocial behavior predicted a .15-unit increase in school engagement (a 7.5% change given the two-point scale). Analyzing magnitude sizes by comparisons of standardized betas allows for more precise statements in comparing the associations between the independent and dependent variables. In reviewing the previous equations, peer engagement in prosocial behavior had almost two times more of a reported effect (a .15-unit increase) on school engagement over reports of perceived peer feedback (i.e. coolness) (a .08-unit increase). We then proceeded with the mediational analyses equation.

Results of the fourth equation (Path C'), this model was tested with variables of school engagement, participants' reports of peer prosocial behavior, perceptions of peer feedback (i.e., coolness), as well as all controls, and accounted for a small statistically significant portion of the observed variability in school engagement, adjusted $R^2 = .04$, $F(9, 3106) = 15.15$, $p < .001$. Results indicated that after controlling for participants' perceived peer feedback (i.e., coolness), peer prosocial behavior was still a statistically significant predictor of school engagement, $b = .018$, $p < .001$, $\beta = .140$. In reviewing the previous equations, even after perceived peer feedback (i.e. coolness) was introduced, peer prosocial behavior was of similar magnitude with almost two times more of a reported effect (a .14-unit increase) on school engagement. However, full mediation as indicated in hypothesis 2a was not supported. Furthermore, a Sobel test was conducted and found support for partial mediation in the model, $t = 2.59$, $SE = .001$, $p < .010$,

such that the positive association between participants' reports of peer prosocial behavior and the levels of youth's school engagement can partially be explained by participants' perceived peer feedback (i.e., coolness). Although partial mediation emerged, interpretations about the relative significance of these results are cautioned as accounting for only four percent of observed variability suggests a low practical significance.

Antisocial behavior in school.

Results of the unconditional-means model predicting youth's antisocial behavior in school indicated systematic nesting of youth's antisocial behavior between schools. The interclass correlation (ICC) indicates that approximately two percent of the observed variance associated with antisocial behavior in school was explained by between-school level differences. Therefore, most of the variance in youth's antisocial behavior in school was accounted for by individual-level variables, the focus of the hypotheses in the present study.

In an examination of the first equation (Path A), this model was tested with variables of perceived peer feedback (i.e., coolness) and peer engagement in prosocial behavior, as well as all controls and accounted for a moderate statistically significant portion of the observed variability in antisocial behavior, adjusted $R^2 = .06$, $F(8, 5960) = 55.63$, $p < .001$. It was found that youth who reported more peers engaged in prosocial behavior also reported higher levels of perceived peer feedback (i.e., coolness), $b = .150$, $p < .001$, $\beta = .260$. Thus, one standard deviation change in peer engagement in prosocial behavior predicted a .26-unit increase in perceived peer feedback (i.e., coolness) (a 5.2% change given the five-point scale) in perceived peer feedback. In light of this statistically significant relationship, we moved forward to test the next step to test mediation. In terms of the second equation (Path B), this model was tested with variables of perceived peer feedback (i.e., coolness) and antisocial behavior in school, as well as all controls and accounted

for a small but statistically significant portion of the observed variability in antisocial behavior, adjusted $R^2 = .02$, $F(8, 6242) = 19.91$, $p < .001$. These results indicated an inverse relationship such that when youth reported higher perceptions of peer feedback (i.e., coolness), they also reported fewer antisocial behaviors in school, $b = -.057$, $p < .001$, $\beta = -.060$. Thus, one standard deviation change in perceptions of peer feedback (i.e., coolness) predicted a -.06-unit decrease in antisocial behaviors in school (a -.7% change given the eight-point scale). Since a statistically significant relationship was found, we proceeded to the third equation. As a test of the third equation (Path C), this model was tested with variables of participants' reports of peer prosocial behavior and antisocial behavior in school, as well as all controls and accounted for a small statistically significant portion of the observed variability in antisocial behavior, adjusted $R^2 = .03$, $F(8, 6012) = 27.6$, $p < .001$. The analyses revealed a statistically significant inverse association between more peers engaged in prosocial behavior and fewer antisocial behavior acts in school, $b = -.060$, $p < .001$, $\beta = -.110$. Thus, one standard deviation change in peer engagement in prosocial behavior predicted a -.11-unit decrease in antisocial behaviors in school (a -1.4% change given the eight-point scale). In reviewing the previous equations, peers engaged in prosocial behavior had almost two times more of a reported effect (a -.11-unit decrease) on antisocial behavior in school over reports of perceived peer feedback (i.e. coolness; a -.06-unit decrease). Since a statistically significant relationship was found, we then proceeded with the mediational analyses equation.

Results of the fourth equation (Path C'), this model was tested with variables of antisocial behavior in school, participants' reports of peer prosocial behavior, perceptions of peer feedback (i.e., coolness), as well as all controls and accounted for a significant portion of the observed variability in antisocial behavior, adjusted $R^2 = .03$, $F(9, 5959) = 24.51$, $p < .001$. These results indicated that after controlling for participants' perceived peer feedback (i.e., coolness), the

number of peers engaged in prosocial behavior was still inversely associated with youth's antisocial behavior in school at a significant level, $b = -.051$, $p < .001$, $\beta = -.100$. In reviewing the previous equations, even after perceived peer feedback (i.e. coolness) was introduced, peer prosocial behavior was almost two times more of a reported effect (a -.10-unit decrease) on school engagement. Therefore, the full mediation as indicated in hypothesis 2b was not supported either. However, a Sobel test was conducted and found support for partial mediation in the model, $t = -2.76$, $SE = .002$, $p < .006$, such that the inverse association between the number of peers engaged in prosocial behavior and the levels of antisocial behavior acts in school can partially be explained by participants' perceived peer feedback (i.e., coolness). Although partial mediation emerged, interpretations about the relative significance of these results are cautioned as accounting for only two percent of the observed variability suggests a low practical significance.

Moderation Analyses to Test Hypotheses 3a-6a

A general explanation of moderation describes that the association between an independent variable and dependent variable varies based on the values of the moderator introduced. Two separate models were computed using similar predictors to examine the influence of perceived feedback from adult (teacher/parent) praise on a) youth's school engagement, and b) youth's antisocial behavior in school. In addition, we tested for "main effects." A main effect describes the association of an independent variable on a dependent variable, net all other variables. After controlling for gender, free and reduced lunch rates, and minority status, the main effect of adult praise was entered, followed by the interaction between adult praise and participants' perceived peer feedback (i.e., coolness). We will discuss the findings below (see Table 5).

School engagement.

This first model tested whether there was a moderating effect of participants' perceived peer feedback (i.e., coolness) on the relationship between adult praise and youth's school engagement. To specifically indicate moderation in this study, regarding hypothesis 4a, it would be the combination of high adult praise plus high coolness that leads to higher school engagement. This model was tested with variables of school engagement, perceived feedback from adults (i.e., adult praise), perceptions of peer feedback (i.e., coolness), as well as the interaction term between adult praise x coolness all controls. This model accounted for a small statistically significant portion of the observed variability in antisocial behavior, adjusted $R^2 = .02$, $F(10, 3216) = 8.23$, $p < .001$. In line with hypothesis 3a regarding youth who report higher perceived feedback from adults (i.e., adult praise) for their prosocial behavior will demonstrate higher school engagement, a first main effect indicated that perceived feedback from adults (i.e., adult praise) on school engagement was statistically significant, such that participants who reported more perceived feedback from adults (i.e., adult praise) also reported higher school engagement, $b = .012$, $p < .01$, $\beta = .050$. Thus, one standard deviation change in perceived feedback from adults (i.e., adult praise) predicted a .05-unit change (a 3% change given the 2-point scale) in school engagement. Also, in line with hypothesis 3b regarding youth who report higher perceptions of peer feedback (i.e., coolness) for their prosocial behavior will demonstrate higher school engagement, a second main effect indicated that the effect of perceived feedback from peers (i.e., coolness) on school engagement was significant, such that participants who reported more perceived feedback from peers (i.e., coolness) reported higher school engagement, $b = .015$, $p < .001$, $\beta = .063$. Thus, one standard deviation change in perceived feedback from peers (i.e., coolness) predicted a .06-unit increase in school engagement (a 3% change given the two-point scale). In reviewing the previous equations, perceived peer feedback (i.e. coolness) had a slightly greater effect (a .06-unit increase)

on antisocial behavior in school over perceived feedback from adults (i.e., adult praise) (a .05-unit increase).

However, we failed to find support for the hypothesis regarding moderation when entering the interaction term. The results indicated no moderation effects; thus the relationship between adult praise and youth's school engagement did not depend upon perceived peer feedback (i.e., coolness) $b = .004, p = .350, \beta = .016$. Although two noteworthy main effects emerged and held in the final model with the interaction term included, interpretations about the practical significance of these results are cautioned as accounting for only two percent of observed variability suggests a low practical significance.

Antisocial behavior in school.

This second model tested whether there was a moderating effect of participants' perceived peer feedback (i.e., coolness) on the relationship between adult praise and youth's antisocial behavior. To specifically indicate moderation in this study, regarding hypothesis 6a, it would be the combination of high adult praise plus high coolness that leads to fewer antisocial behaviors. This model was tested with variables of antisocial behavior, adult praise, perceptions of peer feedback (i.e., coolness), all controls, as well as the interaction term between adult praise x coolness, and accounted for a small statistically significant portion of the observed variability in antisocial behavior in school, adjusted $R^2 = .03, F(10, 6215) = 22.01, p < .001$. In line with hypothesis 5a regarding youth who receive more praise from adults for their prosocial behavior will demonstrate fewer antisocial behaviors, a first main effect indicated that perceived feedback from adults (i.e., adult praise) on antisocial behavior in school was statistically significant, such that participants who reported more perceived feedback from adults (i.e., adult praise) reported fewer antisocial behavior in school, $b = -.098, p < .001, \beta = -.100$. Thus, one standard deviation

change in perceived feedback from adults (i.e., praise) predicted a -.10-unit change (a 3% change given the eight-point scale) in youths' antisocial behaviors in school. Also, a second main effect indicated that the effect of perceived feedback from peers (i.e., coolness) on antisocial behavior in school was statistically significant, such that participants who reported more perceived feedback from peers (i.e., coolness) reported fewer antisocial behavior in school, $b = -.036$, $p < .01$, $\beta = -.037$. Thus, one standard deviation change in perceived feedback from peers (i.e., coolness) predicted a -.04-unit decrease in youths' antisocial behaviors in school (a 0.5% change given the eight-point scale). In reviewing the previous equations, perceived feedback from adults (i.e., adult praise) had almost two times more of a reported effect (a -.10-unit decrease) on antisocial behavior in school over perceived feedback from peers (i.e., coolness; a -.04-unit decrease).

However, we failed to find support for the hypothesis regarding moderation when entering the interaction term. Results indicated no moderation effects, and this relationship did not depend upon perceived peer feedback (i.e., coolness) $b = .016$, $p = .191$, $\beta = .015$. Although two noteworthy main effects emerged and held in the final model with the interaction term included, interpretations about the relative significance of these results are cautioned as only three percent of observed variability suggests a low practical significance.

Discussion

The goal of the present study was to identify processes contributing to variability in antisocial and prosocial behaviors in early adolescence. More specifically, we considered how perceived feedback from adults (i.e., adult praise) and peers (i.e., coolness) might account for some of the established associations between peer involvement in prosocial behaviors and an individual's engagement in prosocial and antisocial behaviors in school. One process involved mediated effects, in which the relationships between peer engagement in prosocial behavior on

participants' school engagement and antisocial behavior in school would be accounted for by perceived peer feedback (i.e., coolness). The second process involved interaction, or moderator effects, in which perceived peer feedback (i.e., coolness) would influence the impact of perceived feedback from adults (i.e., adult praise) on participants' school engagement and antisocial behavior in school, such that the strength of these relationships would depend to a greater extent on the values of perceived peer feedback (i.e., coolness). The author's interpretation of effect sizes follows the standard interpretation offered by Cohen (1988) in which .8 indicates a large effect size (8/10 of a standard deviation unit), .5 indicates a moderate effect size (1/2 of a standard deviation), and .2 indicates a small effect size (1/5 of a standard deviation). In this study, standardized betas serve as a proxy for interpreting effect sizes, thus the range of effect sizes (.02 to .04) among the models indicate an overall pattern of small effect sizes, even if there is statistical significance. Following this common approach, although noteworthy main effects emerged in the aforementioned models, the authors caution about the interpretations of these results based on the small amount of observed variability accounted for in the statistical models. In extension, the adjusted r-squared values serve as a proxy for interpreting variability, since it measures the proportion of the variation in the dependent variable explained by the independent variable, which in this study indicate an overall pattern of small to moderate effect sizes, even if there is statistical significance

One aim of this study draws from developmental frameworks to examine the effects of peer prosocial behavior and participants' perceived feedback from adults (i.e., adult praise) on school engagement and antisocial behavior in school. We hypothesized that youth who have more peers engaged in prosocial behavior and who report more perceived feedback from adults (i.e., adult praise) will report higher school engagement and fewer antisocial behavior in schools

because Schwartz (2008) posits that early adolescents are defining their self-concept with regard to family relationships, peer relationships, academic performance, and many other areas. For example, Benson (2002) explains that schools generate developmental strengths for students by linking family, peers, community and other resource systems drawing them into networks of support that strengthen academic desired goals (i.e., engagement) and social outcomes (i.e., prosocial behavior). Therefore, in line with Skinner and Belmont (1993), students who have peers engaged in prosocial behavior show sustained behavioral involvement in school activities, accompanied by prosocial behaviors.

Another aim of this study investigates processes that influence both prosocial and antisocial behavior in the school context because Dishion, et al., (2012) explain that an important function of early adolescence is the onset of the adolescents' positioning of him/herself in a social context to be attractive to peers, as they initiate the process of pulling away from adult supervision and engaging in reinforcing activities with peers. We hypothesize that perceptions of feedback (i.e., coolness) would both mediate and moderate associations between peer prosocial behaviors on individual's engagement in prosocial and antisocial behaviors because, in line with Spear (2000) who indicate that increases in the value attributed to peer conformity and social interactions during early adolescence may provide the opportunity to explore novel influences on behavior, situations, reinforcers, that promote successful independence. For example, Ellis et al., (2012) explain that peer associations are a key evolutionary-developmental influence for early adolescents. That, social status and acceptance (in addition to material goals) were found to be achieved in groups through risky and antisocial means. Whereas, Hawley (1999) also supports the assertion regarding the importance of peer associations and suggests that the same goals can be achieved by prosocial means. Considering that early adolescence represents a key inflection point

in development that is marked by vulnerability attributed to a conglomerate of biological and environmental influences, youth must negotiate between adult and emerging significant peer associations. Individual perceptions of these experiences may serve an important mechanism in obtaining status, acceptance and material goals during this transitional period.

This study also draws from prevention science to discuss implications of these results for policy and practice focused on prevention/intervention efforts concerned with promoting prosocial and heading-off antisocial behavior. Adding to the research on peer associations and adult influences, this examination of perceptions of peer feedback, (i.e., coolness) elucidates an underscored mechanism that may contribute to the effects of risk and protective factors. We hypothesized that youth who have more peers engaged in prosocial behavior would be positively associated with youth's school engagement via increases in perceived peer feedback (i.e., coolness) because Catalano & Hawkins (1996) explain that individuals adopt the beliefs and values of the social unit to which they are bonded (e.g., prosocial or antisocial behavior). Whether an individual behaves in a prosocial or antisocial manner is directly influenced by the behaviors, beliefs, and values of the social unit that is of greatest importance to the individual. Also, due to Rutter (1979), Werner & Smith, (1982, 1992) and Masten & Garmezy, (1985) who suggest that peer prosocial engagement in socially desired activities, perceptions peers, aspects of their families, and characteristics of their wider social environments, may help some children through adolescents to not engage in problem behaviors and prevail over adversities. Thus, examining the presence or absence and various combinations of protective and risk factors may help guide prevention and intervention strategies focused on influencing the course that certain outcomes may take in the school context if present.

Direct and mediated effects.

Peer prosocial behavior had a significant positive direct effect on youth's school engagement. This is in line with Newcomb, Bukowski, and Pattee's (1993) systemic review, that behavioral skills consisting primarily of socially skilled behaviors are directly related to positive social outcomes. Also, peer prosocial behavior had a significant inverse direct effect on antisocial behavior in school. This also relates to previous research suggesting that the presence of greater proportion of prosocial youth in a peer group is associated with the less delinquent involvement (Haynie, 2002). Further, youth's perceived peer feedback (i.e. coolness) only partially mediated the effects of peer prosocial behavior on youth's school engagement, signifying an indirect influence on these relationships, such that it accounts for some of the variability between peer prosocial behavior and youth's own prosocial and antisocial behavior.

This study adds to this literature indicating that the direct effects of peer prosocial behavior are consistent with the view that this type of social influence plays an important role in the development of early adolescent's school engagement, and that peer prosocial behavior may serve a protective function against developing antisocial behaviors in school. Prior research found prosocial behavior to be an important indicator of social competence developed from early childhood to adolescence (Shonkoff & Phillips, 2000), and longitudinal studies on the development of youth antisocial behavior provide compelling evidence that such behavior is embedded within the peer group (Dishion, McCord, & Poulin, 1999). Furthermore, this study found an inverse relationship between peer prosocial behavior and participants' antisocial behavior such that more peer prosocial behavior reports were associated with fewer reports of youth's antisocial behaviors, adding to previous findings by Patterson et al., (1992) describing that antisocial parents, siblings, and peers to be the main environmental causes of antisocial behavior. These findings are particularly relevant for the literature, as much of the previous research has

focused on examining associations among antisocial behavior peers to antisocial outcomes. Taken together, these findings suggest that peer prosocial behavior represents an important influence that involves group embedded norms and standards operating on early adolescent behavior outcomes, independently than adult and other influences.

In addition to the aforementioned effects of peer prosocial behavior on youth's school engagement and antisocial behavior in school, peer prosocial behavior also had a direct effect on participants' perceptions of peer attitudes regarding perceived feedback from peers (i.e., coolness). As previously stated, few studies exist that examine the effect of perceptions of prosocial peer groups independent of delinquent peers on the formation of prosocial behavior. Therefore, our findings extend the research which examines youth's perceptions of peer feedback (i.e., coolness) in context of a sample of prosocial engaged youth. Therefore, we draw upon previous research on youth associations with deviant peers in explications of our study findings. For example, Megens & Weerman (2011) concluded that perceptions of what peers think and do may still matter in the formation of a youth's own attitudes.

Additionally, prior research found that perceptions of peer behavior was correlated with a youth's own delinquent behavior and delinquent attitudes (Akers, 1998; Akers & Jensen 2006; Warr, 2002; Warr & Stafford, 1991). Given these findings, we suggest that associating with prosocial peers as well as the presence of favorable youth's perceptions of feedback from peers (i.e., coolness) may be important protective factors that influence involvement in youth's school engagement and buffer antisocial behavior in school. Furthermore, after controlling for youth's perceptions of feedback from peers (i.e., coolness) in our study, the significant relationship between peer prosocial behavior and youth's school engagement, as well as the inverse relationship between peer prosocial behavior and antisocial behavior in school were maintained.

This study extends previous research findings by Carson (2013) indicating that perceptions of prosocial peer behavior (i.e., coolness) have a lasting protective effect on the formation of delinquent attitudes. Our findings indicate that more favorable perceptions of feedback from peers (i.e., coolness) may partially account for the associations between prosocial peer behavior and neutralizations of antisocial behavior. These findings extend the research of Catalano and Hawkins (1996) and point to the possibility that peer prosocial behavior has a more constant protective effect on youth's school engagement and fewer antisocial behaviors in school, independent of the influences of youth's perceived feedback from peers (i.e., coolness). That effects of perceived feedback from peers (i.e., coolness), however, may be contextual and situational.

Moderator effects.

This study also examined whether the association between adult praise and youth's school engagement and youths' antisocial behaviors in school that these associations will vary depending on the value attributed to perceptions of feedback from peers (i.e., coolness), such that youth who report more perceptions of feedback from adults (i.e., adult praise) will also report higher perceived peer feedback (i.e., coolness) and fewer antisocial behaviors in school. Although we did not find support for these hypotheses, we did find direct associations among perceived feedback from adults (i.e., adult praise) and perceived feedback from peers (i.e., coolness) for both youth school engagement and youth antisocial behavior in school outcomes, suggesting these are important targets for interventions to bolster positive and reduce negative behaviors. The interaction effects of adult praise were examined because of the reinforcing influences it may have on school engagement and antisocial behavior for early- and middle-childhood and for early adolescents. For example, Fullerton et al., (2009) found adult praise to increase prosocial

behavior. Conversely, Stormont et al., (2007) found adult praise to decrease antisocial behavior. Furthermore, we examined the association between feedback from adults (i.e., adult praise) and feedback from peers (i.e., coolness) to answer the call from Fraser et al., (2004) and Herrenkohl et al., (2004) for further research that include contributions of peer associations, including peer feedback that proceed a positive or negative outcome. We also extend this research by examining the effects of an underscored and specific type of perceptual influence on individual behavior, the perception of feedback from peers (i.e., coolness) on individual behavior outcomes.

The impact of adult praise on youth's school engagement and antisocial behavior in school has been long studied, but the mechanisms of influence remain unclear. This study adds to this literature indicating that the direct effects of adult praise are consistent with the view that this type of social influence plays an important role in the development of early adolescent's involvement in school engagement, and that it serves a protective function in developing antisocial behaviors in school by heading off disruptive behavior. A review of the literature suggests that praise routinely enhances intrinsic and extrinsic motivation (Henderlong & Lepper, 2002). Thus, based on our findings, more perceived feedback from adults (i.e., adult praise) may point to more school engagement and antisocial behaviors in school for youth. Furthermore, perceptions of feedback from peers (i.e., coolness) highlights an important underscored mechanism behind the development of influential processes (i.e., protective and risk factors) that strengthen prosocial and lessen antisocial outcomes.

Limitations

This research provided some advancements to theory, but it is not without its limitations. One limitation can be observed in the data that were examined, as our analyses focused on prosocial peer behavior, it demonstrates a lack of reports regarding the effects of peer antisocial

behavior on youth's school engagement and youth's antisocial behaviors in schools. Further, although noteworthy main effects emerged in the aforementioned models, the authors caution about the interpretations of these results since the focal variables analyzed predicted a small proportion of the variability in this study. In extension, Glass et al., (1981) are particularly critical of Cohen's approach of applying terms like "small," "moderate," and "large" out of context, which was employed in this study to interpret effect sizes, and argue that the effectiveness of a particular intervention can only be interpreted in relation to other interventions that seek to produce the same effect. Thus, this study is limited in that Cohen's standard approach was utilized without interpretations in relation to other similar interventions. For example, in the education context, if it could be shown that making a small and inexpensive change would raise a desired outcome by an effect size of even as little as 0.1, then this could be a significant improvement, particularly if the improvement applied uniformly to all students, and even more so if the effect were cumulative over time.

Another limitation is that all data analyzed were obtained from a cross-sectional, single data collection point and does not provide for longitudinal implications nor inferences. In addition, prior research examined delinquent/prosocial peers in the context of antisocial behavior underscoring the impact of youth's perceptions of peer attitudes and behavior. Lastly, it is important to consider the difference in effects regarding perceived feedback from peers distinctly for peers in the home vs. school context, and the differences among specific dimensions of person vs. process types of adult praise, which is beyond the scope of the data. Finally, although this study reveals direct and indirect effects, we are unable to infer directionality of these findings.

This study extends previous research by using peer prosocial behavior and adult praise in four separate models to predict youth's school engagement and antisocial behavior in school, as

well as to examine the mediation and moderation processes by which youth's perceptions of peer attitudes influence these relationships. Another strength of this study lies in the findings of partial mediation regardless of finding no moderation effects, suggesting that considering youth's perceptions feedback from peers (i.e., coolness) is important when examining experiences of peer prosocial behavior and adult praise on school engagement and antisocial behavior in school. A further strength stems from our combination of perceptions of feedback from peers (i.e., coolness) and direct measures of peer prosocial behavior in that further research would benefit from examinations of indirect and direct measures of peer behavior as well. In addition, although all types of praise may be generally beneficial to youth, the findings from this study motivate further research analyses of praise constructs differentiated by traits, products, or processes and who was to deliver this praise.

Furthermore, it is important that the present findings not be overgeneralized and be presented with caution. At the most basic level, the use of all self-report data is subject to limitations of same-method variance. Another limitation can be found in differential validity that may occur when respondents misrepresent themselves in terms of attitudes and behaviors (Hindelang, Hirschi, & Weis, 1981). In addition, it is possible that the study could have erroneously measured perceptions of peer attitudes regarding rewards for prosocial involvement (i.e., being seen as cool for engaging in prosocial behavior) based on cultural and individual differences, rather than actual peer attitudes regarding rewards for prosocial involvement. At a broader level, these findings are specific to a state-wide subsample of youth in public schools from Arizona, United States or from a Western Culture. Associations in differing types of peer groups in school or at home, as well as differences in the adult use and youth responses to praise may vary culturally

Conclusion and Future Study

Despite these limitations, our study is in line with previous research documenting the protective role of peer prosocial behavior on youth's school engagement. Likewise, in instances in which youth are desired to be less involved in antisocial behavior in school, our study is in line with previous research highlighting the protective role of adult praise. Our study adds to the literature examining the processes by which perceptions of feedback from peers (i.e., coolness) influences the role of both peer prosocial behavior and perceptions of feedback from adults (i.e., adult praise) on youth's school engagement and antisocial behavior in school. Our findings add to research indicating peer prosocial behavior and perceived feedback from adults (i.e., adult praise) are both associated with higher involvement in school engagement and less in antisocial behavior in school for early adolescents. Further, feedback from peers (i.e., coolness) has been thought to influence these relationships, and with partial mediation effects found in our study, these results suggest that there may indeed be important contributors to the protective role of peer prosocial behavior and adult praise that lead to the development of variability in youth's school community and antisocial behaviors in school.

This study has important practical implications. Ongoing strategies employed by teachers and parents to increase prosocial behavior have relied heavily on providing praise in order to motivate desired behaviors from children and youth, and have been met with mixed results. Our findings suggest that behavior skill building would do well to include, in addition to strategies focused on peer prosocial behavior associations and feedback from adults (i.e., adult praise), strategies targeting youth's perceptions of feedback from peers (i.e., coolness) to create systemic opportunities that shape the effects of school climate. For example, since the behavior of peers can have a significant effect particularly on early adolescents in terms of peer motivation on a myriad

of school outcomes, perceptions of feedback from peers (i.e., coolness) represents an important yet overlooked antecedent that can have a significant effect on influential processes (protective and risk factors) that contribute to prosocial and antisocial behavior in schools. Moreover, in regards to policy and practice, prevention/intervention efforts focused on addressing risk and protective factors toward desired outcomes, may do well to consider the assets of positive peer associations and the potential effects they may have on promoting prosocial outcomes, as most studies have focused on effects of peer antisocial behavior associations to antisocial behaviors, representing an important paradigm change. Also, efforts may focus on developing and supporting systems that enhance and reinforce prosocial behavior. In line with research by Veenstra & Dijkstra (2011) who found peer prosocial behavior to have important contagion effects, creating more opportunities for youth to engage in prosocial activities with prosocial peers may call positive attention to prosocial peer behavior experiences. Furthermore, Eisenberg et al., (2006) suggest that during early adolescence and subsequent years, the boost in prosocial behavior has been attributed to increased cognitive development in regards to empathy and perspective taking, such that, in turn, these experiences with prosocial peers may further shape and influence youth's individual perceptions of feedback from peers (i.e., coolness) that can then have positive effects on prosocial desired behavior in various contexts. These findings suggest that other factors beyond those observed in this study focused on the school context (e.g., neighborhood, SES, etc.) may contribute to variability. Particularly, knowledge of the relationships between peer prosocial behavior, perceived peer feedback (i.e., coolness), perceived adult feedback (i.e., adult praise), school engagement, and antisocial behavior in school in this study can help aim interventions toward implementing cumulative strategies that reduce the likelihood of problem outcomes.

Our findings presented here support previous research showing that peer associations are

important to adjusting behavior among early adolescents beyond adult influences. Future studies would benefit by further examining the directionality between peer associations and perceptions of feedback from peers and adults on the formation of youth's prosocial school engagement and antisocial behavior acts in school. In addition, future research can examine for any potential geographical effects by testing the models of this study within particular neighborhoods or school districts and potentially make comparisons regarding the findings to the various state-wide neighborhoods or other school districts. Also, future studies may benefit from examining gender and cultural differences, as peer associations may present different effects on individual perceptions of feedback from peers (i.e., coolness) and from adults (i.e., adult praise) for females and males in both prosocial and antisocial peer groups.

In conclusion, the current study is able to make advancements to developmental, evolution, and prevention science by focusing on contributions that perceptions of peer prosocial behavior, perceptions of feedback from adults (i.e., adult praise), and perceptions of feedback from peers (i.e., coolness) can have on the development of prosocial and antisocial behavior in the school context for early adolescents. Findings indicate that perceptions of feedback from peers (i.e., coolness) along with peer prosocial behavior and adult praise are linked to early adolescents' self-reports of school engagement and antisocial behavior in school. These results indicate the importance of continuing to examine influential processes (i.e., protective and risk factors) that may predict prosocial and antisocial behavior.

Overall, a sizeable literature on prosocial and antisocial behavior supports the importance of peer and adult influences as useful constructs in understanding a range of critical behaviors among youth. This study is unique in its examination of an understudied factor that contributes to prosocial and antisocial behavior in youth, in the form of perceptions of feedback from peers (i.e.,

coolness), which was found to have statistically significant effects on behavioral outcomes among early adolescents. The results suggest that during early adolescence, in particular, the nature of peer perceptions regarding youths' engagement in prosocial behavior is an important contributor to the variability in youth's prosocial and antisocial behavior in school, and that this variability can be differentially associated with desired school attitudes and behaviors as an important yet underscored target aim for behavioral interventions.

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Tables

Table 1. *Descriptives of 8th Grade Students from the 2012 Arizona Youth Survey Questionnaire, Arizona Criminal Justice Commission (N = 6,525)*

Characteristic	<i>N</i>	(%)	<i>M</i>	(<i>SD</i>)	Min.	Max.
Gender						
Male	3944	(60)				
Female	2581	(40)				
Age						
12	10	(.1)	13.74	(.58)	12	16
13	2213	(33)				
14	4035	(60)				
15	461	(7)				
16	10	(.1)				
Race/Ethnicity¹						
White Only	2946	(43.8)				
Hispanic Only	2764	(41.1)				
American Indian Only	460	(6.8)				
African American/Black Only	380	(5.6)				
Asian Only	125	(1.9)				
Hawaiian/Pacific Islander Only	54	(.8)				
Family Socioeconomic Status						
Free Lunch	3425	(52)				
Reduced Lunch	688	(11)				
Paid Lunch	2457	(37)				

¹ Respondents had the option to mark more than one ethnic identity, with the following breakdown.

Table 2. *Bivariate Correlations of Key Study Variables (N= 6,525)*

Variable	1	2	3	4	5
1. Perceived adult feedback (adult praise)	—				
2. Peer prosocial behavior	.25**	—			
3. Perceived peer feedback (coolness)	.29**	.25**	—		
4. School & community engagement	.05**	.13**	.08**	—	
5. Antisocial behavior acts	-.10**	-.11**	-.06**	-.03**	—
<i>M</i>	7.12	2.18	8.01	1.17	1.83
<i>SD</i>	1.945	1.80	3.08	.58	3.74

** . Correlation is significant at the 0.01 level (2-tailed).

Table 3. Results from Multilevel Mediation Model of Perceived Peer Feedback (Coolness) on Associations Between Peer Prosocial Behavior & School Engagement (N=6,525)

Steps	Variables	Unstandardized Coefficient		Standardized Coefficient	p	F	R ²	AR ²
		b	SE	β				
1 Path A (pro-behav regressed on coolness)						55.63***	.07	.06
	Perceived prosocial behavior	.15	.01	.26***	.001			
	Gender	.05	.03	-.03*	.05			
	Lunch	-.06	.02	-.05***	.001			
	RaceAIONLY	-.06	.07	-.01	.45			
	RaceASIANONLY	.09	.11	.01	.44			
	RaceHAWPACONLY	.15	.15	.01	.33			
	RaceHISPANIC	-.07	.06	-.04	.21			
	RaceWhite, not Hispanic	-.07	.06	-.03	.27			
2 Path B (coolness regressed on sch-eng)						9.48***	.02	.02
	Perceived peer f-back (coolness)	.20	.00	.08***	.001			
	Gender	.05	.01	.09***	.70			
	Lunch	.02	.01	.08***	.01			
	RaceAIONLY	-.01	.02	.00	.61			
	RaceASIANONLY	.08	.04	.04*	.05			
	RaceHAWPACONLY	-.02	.05	-.03	.33			
	RaceHISPANIC	.01	.02	.02	.23			
	RaceWhite, not Hispanic	-.00	.02	-.00	.96			
3 Path C (p-behav regressed on sch-eng)						16.23***	.04	.04
	Perceived prosocial behavior	.02	.00	.15***	.001			
	Gender	.05	.01	.09***	.001			
	Lunch	.02	.01	.08***	.001			
	RaceAIONLY	-.01	.02	-.01	.57			
	RaceASIANONLY	.10	.04	.70*	.05			
	RaceHAWPACONLY	-.01	.05	-.02	.82			
	RaceHISPANIC	.01	.02	.03	.62			
	RaceWhite, not Hispanic	.00	.02	.00	.96			
4 Path C' (full model)						15.15***	.04	.04
	Perceived prosocial behavior	.02	.00	.14***	.001			
	Perceived peer f-back (coolness)	.01	.00	.05**	.01			
	Gender	.04	.01	.09***	.001			
	Lunch	.02	.01	.08***	.001			
	RaceAIONLY	-.01	.02	-.01	.58			
	RaceASIANONLY	.10	.04	.05*	.05			
	RaceHAWPACONLY	-.01	.05	-.01	.77			
	RaceHISPANIC	.01	.02	.02	.62			
	RaceWhite, not Hispanic	.00	.02	.00	.96			

Note: All race variables were compared using African American as the reference group. *p < .05. **p < .01. ***p < .001

Table 4. Results from Multilevel Mediation Model of Perceived Peer Feedback (Coolness) on Associations Between Peer Prosocial Behavior on Antisocial Behavior in School (N=6,525)

Steps	Variables	Unstandardized Coefficient		Standardized Coefficient	<i>p</i>	<i>F</i>	<i>R</i> ²	<i>AR</i> ²
		<i>b</i>	SE	β				
1 Path A (<i>p-behav regressed on coolness</i>)						55.63***	.07	.06
	Perceived prosocial behavior	.15	.01	.26***	.001			
	Gender	.05	.03	-.03*	.05			
	Lunch	-.06	.02	-.05***	.001			
	RaceAIONLY	-.06	.07	-.01	.45			
	RaceASIANONLY	.09	.11	.01	.44			
	RaceHAWPACONLY	.15	.15	.01	.33			
	RaceHISPANIC	-.07	.06	-.04	.21			
	RaceWhite, not Hispanic	-.07	.06	-.03	.27			
2 Path B (<i>coolness regressed on anti-beh</i>)						19.91***	.03	.02
	Perceived peer f-back (coolness)	-.06	.01	.06***	.001			
	Gender	-.19	.03	.10***	.001			
	Lunch	-.06	.02	-.05***	.001			
	RaceAIONLY	-.04	.07	-.01	.54			
	RaceASIANONLY	-.40	.11	.41***	.001			
	RaceHAWPACONLY	.19	.16	.10	.20			
	RaceHISPANIC	-.12	.06	-.11*	.05			
	RaceWhite, not Hispanic	-.24	.06	-.24***	.001			
3 Path C (<i>p-behav regressed anti-beh</i>)						27.60***	.04	.03
	Perceived prosocial behavior	-.06	.01	-.11***	.001			
	Gender	-.18	.03	-.09***	.001			
	Lunch	-.05	.02	-.05***	.001			
	RaceAIONLY	-.05	.07	-.00	.49			
	RaceASIANONLY	-.38	.11	.07***	.001			
	RaceHAWPACONLY	.18	.15	.09	.22			
	RaceHISPANIC	-.14	.06	-.14*	.05			
	RaceWhite, not Hispanic	-.26	.06	-.00***	.001			
4 Path C' (<i>full model</i>)						24.51***	.04	.03
	Perceived prosocial behavior	-.05	.01	-.10***	.001			
	Perceived peer f-back (coolness)	-.03	.01	-.04**	.01			
	Gender	-.17	.03	-.09***	.001			
	Lunch	-.05	.02	-.05***	.001			
	RaceAIONLY	-.05	.07	-.00	.46			
	RaceASIANONLY	-.38	.11	-.73***	.001			
	RaceHAWPACONLY	.19	.15	.21	.18			
	RaceHISPANIC	-.13	.05	-.07*	.05			
	RaceWhite, not Hispanic	-.30	.06	-.30***	.001			

Note: All race variables were compared using African American as the reference group. **p* < .05. ***p* < .01. ****p* < .001

Table 5. Results from Multilevel Moderation Models of Perceived Peer Feedback (Coolness) on Associations Between Adult Praise and School Engagement & Adult Praise and Antisocial Behavior in School (N=6,525)

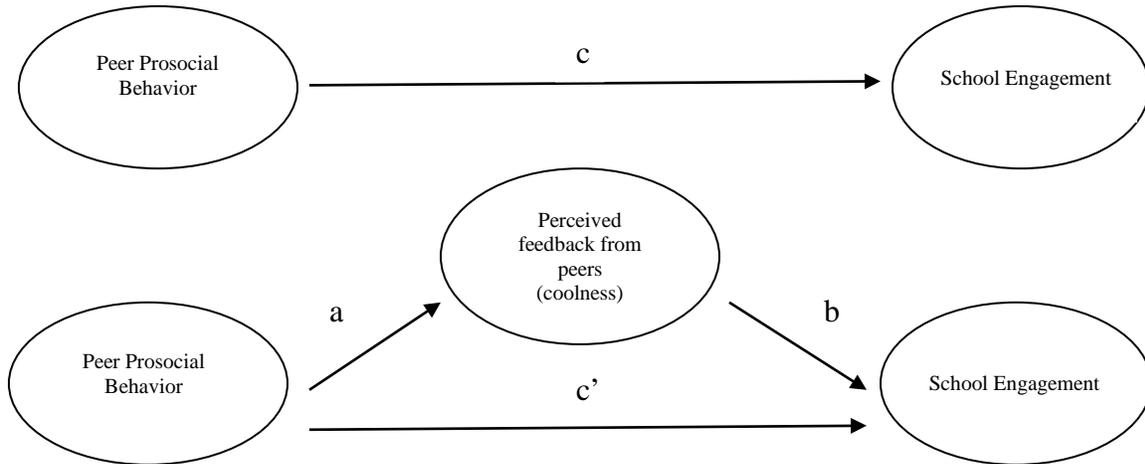
Models	Variables	Unstandardized Coefficient		Standardized Coefficient	<i>p</i>	<i>F</i>	<i>R</i> ²	<i>AR</i> ²
		<i>b</i>	SE	β				
1 <i>School Engagement</i>					.01	8.23***	.03	.02
	Perceived adult f-back (adult praise)	.01	.01	.05**				
	Perceived peer f-back (coolness)	.02	.01	.06***	.001			
	Gender	.05	.01	.10***	.001			
	Lunch	.02	.01	.08***	.001			
	RaceAIONLY	-.01	.03	-.01	.64			
	RaceASIANONLY	.07	.04	.04	.05			
	RaceHAWPACONLY	.01	.05	-.01	.80			
	RaceHISPANIC	.01	.02	.02	.59			
	RaceWhite, not Hispanic	.01	.02	.00	.74			
	Adult Praise x Coolness	.00	.00	.02	.35			
2 <i>Antisocial Behavior in School</i>						22.01***	.03	.03
	Perceived adult f-back (adult praise)	-.10	.01	-.10***	.001			
	Perceived peer f-back (coolness)	-.04	.01	-.04**	.01			
	Gender	-.20	.03	-.10***	.001			
	Lunch	-.06	.02	-.06***	.001			
	RaceAIONLY	-.07	.07	-.01	.51			
	RaceASIANONLY	-.37	.11	-.05***	.001			
	RaceHAWPACONLY	.19	.15	.02	.19			
	RaceHISPANIC	-.13	.06	-.06*	.05			
	RaceWhite, not Hispanic	-.25	.06	-.12***	.001			
	Adult Praise x Coolness	.00	.00	.02	.22			

Note: All race variables were compared using African American as the reference group. **p* < .05. ***p* < .01. ****p* < .001

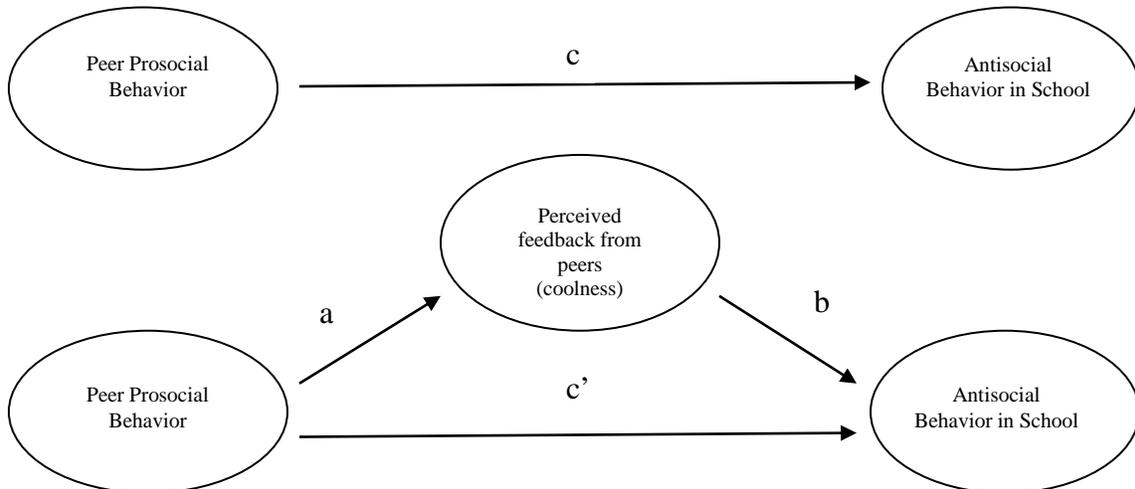
Figure Caption

Figure 1: Conceptual Mediation Models of Perceived Feedback from Peers (i.e., Coolness)

Model A.

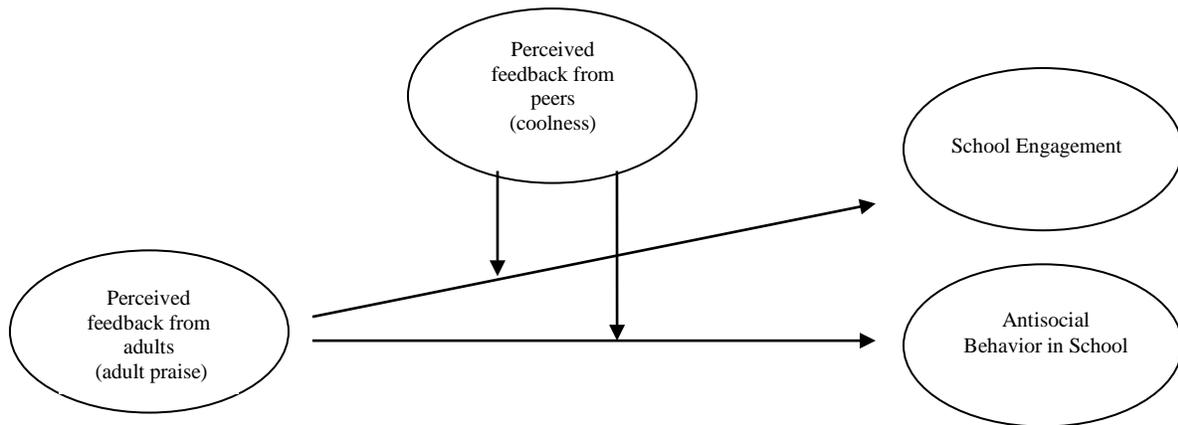


Model B.



Note. Associations between peer prosocial behavior with school engagement and antisocial behavior in school, controlling for gender, free and reduced lunch rates, and racial/ethnic identity.

Figure 2: Conceptual Moderation Model of Perceived Feedback from Peers (i.e., Coolness)



Note. Associations between adult praise with school engagement and antisocial behavior in school, controlling for gender, free and reduced lunch rates, and racial/ethnic identity.