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Prosocial Behavior: Long-Term Trajectories and Psychosocial Outcomes

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Abstract

This study investigated developmental trajectories for prosocial behavior for a sample followed from age 10 – 18 and examined possible adjustment outcomes associated with membership in different trajectory groups. Participants were 136 boys and 148 girls, their teachers, and their parents (19.4% African American, 2.4% Asian, 51.9% Caucasian, 19.5% Hispanic, and 5.8% other). Teachers rated children's prosocial behavior yearly in grades 4 – 12. At the end of the 12th grade year, teachers, parents, and participants reported externalizing behaviors and participants reported internalizing symptoms, narcissism, and features of borderline personality disorder. Results suggested that prosocial behavior remained stable from middle childhood through late adolescence. Group-based mixture modeling revealed three prosocial trajectory groups: low (18.7%), medium (52.8%), and high (29.6%). Membership in the high prosocial trajectory group predicted lower levels of externalizing behavior as compared to the low prosocial trajectory group, and for girls, lower levels of internalizing symptoms. Membership in the medium prosocial trajectory group also predicted being lower on externalizing behaviors. Membership in the high prosocial trajectory group predicted lower levels of borderline personality features for girls only.

Prosocial behavior has been associated with a wide range of positive individual characteristics and outcomes, including empathy (Batson, 1987; Batson, Fultz, & Schoenrade, 1994; Penner, Dovidio, Piliavin, & Schroeder, 2005), agreeableness (Graziano & Eisenberg, 1997; Caprara, Alessandri, Di Giunta, Panerai, & Eisenberg, 2010), and peer acceptance (Crick, 1996; Layous, Nelson, Oberle, Schonert-Reichl, & Lyubomirsky, 2012). Prosocial behavior includes "voluntary actions that are intended to benefit or help an individual or group of individuals" (Eisenberg & Mussen, 1989, p.3). Although prosocial behavior has been studied extensively, little of this research has focused on tracing the development of prosocial behavior in the same group of individuals over time (see Côté, Tremblay, Nagin, Zoccolillo, & Vitaro, 2002; Nantel-Vivier, et al., 2009; Nantel-Vivier, 2011 for exceptions). Additionally, although many have studied the positive traits and outcomes associated with prosocial behavior, few have considered the potential relationship between prosocial behavior and externalizing and internalizing symptoms (Nantel-Vivier, et al., 2009; Nantel-Vivier, Pihl, & Tremblay, 2010). This research investigates whether

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children follow distinct prosocial trajectories across middle childhood and adolescence, and examines potential adjustment outcomes associated with being on a particular trajectory.

The Relationship between Prosocial Behavior and Age

Given the fundamental role that social cognition seems to play in prosocial behavior, psychologists have typically thought that prosocial behavior increases consistently with age (Fabes, Carlo, Kupanoff, & Laible, 1999). The theoretical roots of this belief can be traced to Kohlberg's Theory of Moral Development (1977; 1984; Colby, Kohlberg, Gibbs, & Lieberman, 1983). As children's cognitive capacities expand, their perspective taking skills improve, thereby allowing them to reason about moral issues with greater complexity and discernment (Colby et al., 1983; Eisenberg, Lennon, & Roth, 1983). Similarly, perspective taking seems critical to the development of empathy and by extension helping behaviors. Thus, many have reasoned that, given perspective taking increases over time, the frequency of prosocial acts should also increase across childhood and adolescence (Eisenberg, 1986; Eisenberg & Miller, 1987; Fabes et al., 1999). Likewise, Martin Hoffman's theory of parental discipline (1970; 1975) maintains that using inductive discipline techniques, whereby the parent encourages the child to consider how his behavior affects others, cultivates empathy and empathy-based guilt. Some researchers have extended this research to suggest that such parental discipline techniques may be important for building prosocial behavior during childhood given that empathy and sympathy have been found to be consistently associated with pro-social behavior (Krevans & Gibbs, 1996; Eisenberg & Eggum, 2008; Balconi & Canavesio, 2013; Eisenberg, 2003).

However, recent research suggests that the relationship between age and prosocial behavior is more complex. Eisenberg & Fabes (1998) conducted a meta-analysis of 179 studies of prosocial behavior and found that whether or not prosocial behavior increased with age depended upon the study design and measures used to assess prosocial behavior. For instance, the study found that teenagers engaged in more prosocial behavior than children ages 7 to 12 but only for measures of sharing or donating, not helping or comforting. Moreover, prosocial behavior increased with age in experimental and structured studies but not in naturalistic or correlational designs. Other studies have indicated that prosocial behavior tends to plateau over time. According to Caplan (1993), as children age, their prosocial tendencies become counterbalanced by self-interest or other inhibitory factors. In effect, they become more discriminatory about whom to help and under what circumstances.

Other important developmental tasks that arise in middle and late childhood likely also relate to the development of prosocial behavior. For instance, it has been well established that feeling a sense of belonging within a peer group becomes very important during middle childhood (Burhmester, 1996; Gottman & Mettetal, 1986; and Sullivan, 1953). It is possible that, at this age, a motivation to act prosocially—and perhaps to be more selective about to whom—could be integrally tied to the desire to find and maintain one's place amongst peers. Furthermore, on a physiological level, it is possible that the hormonal cascade and rapid physical changes elicited during puberty could affect social adjustment and identity formation in ways that impact prosocial tendencies (Collins & Steinberg, 2006).

Previous studies examining the relationship between age and prosocial behavior relied on comparing children from different age cohorts. The current study, being longitudinal in design, will address this important limitation. By tracing changes in prosocial behavior within the same group of children over several years, we hope to clarify the relationship between prosocial behavior and age.

Prosocial Behavior and the Personality-Situation Debate

For most of the last century, the view that prosocial behavior was situation-specific prevailed. In one of the largest studies of moral development in children, Hartshorne & May (1928) found little consistency in children's moral behavior and concluded that there was no such thing as a prosocial personality. Several decades later, a major study by Gergen, Gergen, & Meter (1972) determined that personality research on prosocial behavior was a "quagmire" (p. 113). However, the 1980s saw an increase in studies that found individual differences in people's willingness to help others in distress (Davis, 1980; Penner, Escarraz, & Ellis, 1983). Penner, Fritzsche, Craiger, & Freifeld (1995) developed the Prosocial Personality Battery, comprised of a combination of personality scales "found to correlate with prosocial affects, cognitions, behaviors" (p.4), which has been tested reliably with various samples from university students to retail store employees. In perhaps the most ambitious study to date of the stability of prosocial tendencies, Eisenberg, et al., (1999) found evidence that prosocial dispositions emerge in early childhood and remain moderately consistent into young adulthood. Their study followed 32 individuals over 19 years, from ages 4–5 through ages 23–24, and found that spontaneous sharing in the preschool classroom predicted prosocial behavior, cognitions, and empathy-related responding up to 17 years later, as measured by various measures at different time points, including observations, mother-reports, peer-reports, and self-reports.

Although the origins of prosocial behavior remain hotly contested, much of the recent research on this topic suggests that prosocial tendencies remain at least moderately stable within individuals. Our study will address this issue directly by investigating whether or not consistencies in prosocial levels are observed within individuals across several critical years of development, as rated by different reporters across time. An additional strength of our study lies in the use of the same measure to assess prosocial behavior across all ten years. Although Eisenberg et al (1999) used a variety of measures to evaluate prosocial behavior, each individual measure was employed for only a few years, making their results more complicated to interpret. By rating the behavior of all participants according to the same prosocial scale, this study maintains a consistent operational definition of prosocial behavior, allowing us to interpret our results with greater confidence.

Prosocial Trajectories

The few previous studies that have examined prosocial trajectories find stable or declining paths over time. One study that followed 1,856 students from ages 6 to 12 found that students followed high, moderate, or low stable trajectories of prosocial behavior according to teacher report (Côté, et al., 2002). No significant increase in prosocial behavior was observed, and in fact 50% of children declined in prosocial behavior over the 6 years.

Similarly, Nantel-Vivier, et al (2009) conducted two large studies tracing prosocial trajectories in Canadian youth from ages 10–15 and Italian youth from ages 10–14. The study of Canadian children assessed prosocial behavior through teacher and mother-report. Three trajectories were identified from teacher-report, whereas five were identified through mother-report. Comparatively, the Italian study used teacher and self-report. Three trajectories were identified from self-report, whereas four trajectories were identified from teacher-report. Between the two studies, all but one of the developmental trajectories were characterized by stable or declining levels of prosocial behavior. Another paper, which investigated prosocial behavior between 7th and 12th grades, as rated by self-report, found moderate stability in individual differences of prosocial behavior. Furthermore, rates of prosocial behavior decreased overall during the course of high school, with a slight rebound in 12th grade (Carlo, Crockett, Randall, & Roesch, 2007). Eisenberg, Cumberland, Guthrie, Murphy, and Shepard (2005) found that from adolescence into early adulthood some aspects of prosocial moral reasoning and perspective taking increased whereas simple prosocial tendencies (helping, sympathy) did not increase. This study extends previous research on prosocial trajectories by examining patterns of development within the same sample across a longer time period than has been previously studied. Because a different teacher assessed prosocial behavior each year for each individual child, this study provides a strong test of the consistency of prosocial behavior across time.

Prosocial Trajectories and Negative Outcomes

Given that externalizing behaviors often reflect hostility towards one's environment, whereas prosocial behaviors are, by definition, beneficial towards others, it follows logically that these two types of behaviors would be inversely related. Moreover, empathy, a common antecedent of prosocial behavior, has been associated with low levels of externalizing behaviors (Cohen & Strayer, 1996; Miller & Eisenberg, 1988). Indeed, several studies have found a negative relationship between prosocial behavior and externalizing problems (Bandura, Caprara, Barbaranelli, Pastorelli, & Regalia, 2001; Samson, Ojanen, & Hollo, 2012; Choi, Johnson, & Johnson, 2011). However, only one longitudinal study to date has examined externalizing and internalizing outcomes associated with prosocial trajectories. In their longitudinal study of children from age 2 to 11, Nantel-Vivier, Pihl, & Tremblay (2010) found that children who were on a high prosocial trajectory, as rated by the parent most knowledgeable about the child, were less physically aggressive and exhibited fewer depressive symptoms. However, these children were also more likely to be more anxious. Moreover, a few studies have pointed toward a possible gender effect moderating the relationship between prosocial behavior and internalizing problems. One study found that girls whose play showed greater sensitivity to moral concerns had higher depression levels at age 18 (Gjerde & Block, 1991). Similarly, Gore, Aseltine, & Colten (1993) found that having a high "caring" orientation was associated with higher depression levels in girls, but not boys. Thus the research remains inconclusive as to whether or not following a high prosocial trajectory protects against negative outcomes, especially with regards to internalizing problems.

The Current Study

This research extends earlier work on the outcomes associated with prosocial behavior by studying developmental trajectories across 9 years, from middle childhood through late adolescence. Based on previous evidence, we expected three distinct prosocial trajectories (Nantel-Vivier et al., 2009; Côté, et al., 2002). We predicted that there would be one trajectory of children who engage in high levels of prosocial behavior, one trajectory of children who display moderate levels of prosocial behavior, and one trajectory marked by consistently low levels of prosocial behavior. Moreover, we predicted that those distinct trajectories would remain stable over the nine-year period in concordance with past research (Côté et al., 2002; Nantel-Vivier, 2009; Nantel-Vivier, et al., 2011).

Second, we predicted that being on a higher prosocial trajectory would be associated with fewer externalizing and internalizing behaviors (Nantel-Vivier, Pihl, & Tremblay, 2010). We also predicted that we would find a modest positive relationship between internalizing problems and high prosocial behavior in females (Gjerde & Block, 1991; Gore, Aseltine, & Colten, 1993). Conversely, we expected that being on a low prosocial trajectory would be associated with higher levels of externalizing and internalizing problems. Finally, we were interested in determining whether or not being on a high prosocial trajectory was protective against narcissistic personality features or borderline personality features. To our knowledge, no previous studies have examined the relationship between prosocial behavior and personality disorder features in children and adolescents. We predicted that those on a high prosocial trajectory would show lower levels of narcissistic and borderline personality traits, because both narcissistic and borderline personality include an excessive focus on the self, and also given that borderline and narcissistic personality features have been associated with internalizing (Wolf, Miller, Harrington, & Reardon, 2012; Kernberg & Yeomans, 2013; Luca, Luca, & Calandra, 2012; James & Taylor, 2008) and externalizing problems (Underwood, Beron, & Rosen, 2011; Stolorow & Harrison, 1975).

Method

Participants

The sample for this study included 136 boys and 148 girls, their parents, and teachers. Participants were initially recruited from local elementary schools at the end of the 3rd grade year at some schools and at the beginning of the 4th grade year at others (mean age; 9 years old), and assessments occurred annually through age 18, at the end of the 12th grade year. The sample was ethnically diverse and representative of the county in the southwestern United States from which participants were recruited: 19.9% African American, 2.4% Asian, 51.9% Caucasian, 19.5% Hispanic, and 5.8% of another race, mixed race, or did not disclose their race. During the year in which participants were recruited, parents reported annual income on a five-point scale; 17.5% reported annual income below $25,000, 23.5% reported $26,000 – $50,000, 19.7% reported $51,000 – $75,000, 32.1% reported $76,000 – $100,000, 2.6% reported income greater than $100,000, and 5.6% did not report their annual income. The majority of participant children's parents were married (70.1%), during the initial year of data collection.

Participant children's teachers in grades 4 - 12 were invited to rate the students' psychological adjustment and social behavior at school. During grades 4 – 6, participants' elementary school teachers, who instructed their students for the entire day, provided ratings of students' behavior. As participants transitioned into middle school for grades 7 and 8, the students' language arts teachers, who instructed students for two class periods per day, provided ratings. When participants entered high school (grades 9 – 12), they identified the teacher "who knew them best" each year, who provided ratings of the child's behavior. If participants did not nominate a teacher "who knew them best", their language arts teacher provided ratings. The proportions of students with teacher ratings of prosocial behavior varied across each school year (4^{th} grade – 68%; 5^{th} grade – 79%; 6^{th} grade – 77%; 7^{th} grade – 68%; 8^{th} grade – 71%; 9^{th} grade – 54%; 10^{th} grade – 63%; 11^{th} grade - 53%; 12^{th} grade – 50%).

The parent who was most knowledgeable about the participant's social relationships and activities also provided ratings of the participant's behavior and adjustment. For the majority of the sample, the parent most knowledgeable about the child was the mother (86%). Due to a separate component of the longitudinal study (an observational task involving a conversation about social relationships between the participant and the most knowledgeable parent) only one parent was included as a rater.

Procedure

Initial consent to participate in the longitudinal study was obtained by providing permission letters to participants' parents. The consent rate for the 10-year longitudinal study was 55%, which is comparable to or even higher than school based studies with a single data collection (Sifers, Puddy, Warren & Roberts, 2002). Teachers were contacted each year during early spring via telephone or email and asked to complete several questionnaires assessing the participant students' behavior and psychosocial adjustment. Teachers of students in grades 4 – 7 were compensated $25 per student evaluated. Compensation increased to $50 per student for teachers in grades 8 – 12. Teachers completed a modified version of the Children's Social Behavior Scale-Teacher form (CSBS-T; Crick 1996) and the Teacher Report Form version of the Child Behavior Checklist (Achenbach & Rescorla, 2001) each year during grades 4 through 12. During the summer following their 12^{th} grade year, participants and their parents were contacted by telephone or email and scheduled for a visit either in their home or in the lab, depending on the participant and his or her parents' preferences. During these visits, parents completed the Child Behavior Checklist (Achenbach & Rescorla, 2001). Participants completed the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini, Vajanovic, Parachini, Boulanger, Frankenburg & Hennen, 2003) the Narcissistic Personality Inventory for Children (NPI-C; Barry, Frick & Killian, 2003), and the Youth Self Report version of the Child Behavior Checklist (YSR; Achenbach & Rescorla, 2001).

Measures

Prosocial behaviour—To rate participant's prosocial behavior, teachers completed the Children's Social Behavior Scale-Teacher form (CSBS-T; Crick 1996) at the end of the spring semester in grades 4, 5, 6, 7, 8, 9, 10, 11 & 12. Teachers rated students' involvement

in a variety of behaviors on a 5-point Likert scale (1 = “This is never true of this student” to 5= “This is almost always true of this student”). The prosocial subscale of the CSBS-T includes four items (“This child says supportive things to peers”, “This child tries to cheer up peers when they are sad or upset about something”, “This child is helpful to peers”, and “This child is kind to peers”). During the seventh grade, the wording of two items was adjusted (“This student is helpful to peers” was replaced with “This student shows interest and concern for others” and the item “This student is kind to peers” was adjusted to read “This student does nice things for others and is kind to peers”). The prosocial subscale had high reliability at each time point (all α’s > .88).

Externalizing behaviors—At the end of the 12th grade year and during the summer following, participants’ parents completed the Child Behavior Checklist (CBCL), teachers completed the Teacher Report Form of the Child Behavior Checklist (TRF-CBCL; Achenbach & Rescorla, 2001), and participants completed the Youth Self-Report from of the CBCL (YSR-CBCL). This well validated measure consists of 112 items on a 3 item scale (0 = “Not True” to 2 = “Very True or Often True”). Of interest to this study is the broadband Externalizing Problems dimension, including items assessing rule-breaking and aggressive behaviors. The Externalizing dimension includes 34 items for parents and 32 items for teachers and youth (e.g. “breaks rules”, “lies, cheats”, “sets fires”, “argues a lot”, “attacks people”). The Externalizing Problems dimension has established test-retest reliability for parents and teachers (α = .94 and .95 respectively) and has been shown to correlate with Conduct Disorder diagnoses (Achenbach & Rescorla, 2001). Inter-item reliability for the Externalizing Problems dimension in this sample was strong for parents, teachers, and participants’ self-reports (α = .94, .87, and .85, respectively).

Internalizing symptoms—During the summer following the 12th grade year, participants completed the Youth Self Report form-Child Behavior Checklist (YSR-CBCL; Achenbach & Rescorla, 2001) assessing their internalizing symptoms, including anxiety, depression, and somatic complaints. This empirically derived measure also includes 112 items on a 3 item scale (0 = “Not True” to 2 = “Very True or Often True”). Relevant to this study is the broadband Internalizing Symptoms dimension, comprised of the anxious-depression, withdrawn-depression, and somatic complaints, which contains 31 items (e.g. “must be perfect”, “nervous, tense”, “rather be alone”, “headaches {without medical cause}”). The Internalizing Symptoms dimension has established test-retest reliability (α = .9) and has demonstrated discriminant validity in distinguishing between referred and non-referred youth (Achenbach & Rescorla, 2001). Inter-item reliability for the Internalizing Symptoms dimension was strong (α = .86).

Borderline personality features—Participants completed the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini, Vujanovic, Parachini, Boulanger & Frank, 2003), assessing the presence of personality features and behaviors indicative of borderline personality disorder. The measure includes ten items, summed together, for which the individual endorses whether or not they have engaged in the behavior within the past year (1 = Yes, 0 = No; e.g. “Have any of your closest relationships been troubled by a lot of arguments or repeated breakups?”, “Have you been extremely moody?”,

"Have you often felt that you had no idea of who you are or that you have no identity?"). High scores indicated greater features of borderline personality disorder. The MSI-BPD measure has been found to be effective at identifying young adults with Borderline Personality Disorder (Zanarini, et al., 2003), and had moderate inter-item reliability in this sample (α = .8)

Narcissistic personality features—To assess narcissistic personality features, participants completed the child form of the Narcissistic Personality Inventory (NPI-C; Barry, Frick & Killian, 2003). Although participants were predominantly 18 years old during the summer following their 12th grade year, the child version of the NPI measure was used to align with previous years' data collection. The NPI-C consists of a series of opposing statements (e.g. "I am good at getting other people to do what I want" and "I am not good at getting other people to do what I want"). Participants selected the statement that was most accurate about them, and then identified whether that statement was "sort of true" or "really true'. Accordingly, each item was rated on a 4-point scale. Items were summed together, with higher scores indicated greater features of narcissistic personality. Previous research has established strong internal consistency (Barry et al., 2003). The inter-item reliability for this sample was moderate (α = .74)

Results

Analytic Plan

The analysis began by examining descriptive statistics and correlations for our prosocial indicators. We next tested an unconditional baseline growth model for prosocial behavior. This model provided an average prosocial trajectory around which students varied. Third, we constructed mixture (group-based) models that classified students separately into trajectory classes (Nagin, 1999). We determined the polynomial degree and number of classes for each aggression variable using a combination of the Bayesian Information Criterion (BIC) and likelihood ratio tests (LRT) as well as through an analysis of the parameter estimates (BIC; Nagin, 2005; LRT; Muthén & Muthén, 2012). Last, we examined whether group membership in the prosocial trajectory categories predicted internalizing, externalizing, maladaptive narcissism, and borderline personality features. This outcome modeling was done using structural equation modeling, multinomial logit, or ordinary least squares depending on the available indicators.

Growth and prediction models were estimated using a combination of Mplus (Muthén & Muthén, 1998–2012) and Stata (StataCorp, 2011). The metric of the teacher prosocial variables was examined and determined to be continuous with similar scales across years. The distributions, however, varied at times from a normal distribution and so we used a robust estimator that allowed for nonnormality. In order to account for missing data in the construction of the trajectories, we used a maximum likelihood approach that allowed all observations to contribute to the estimated results (Muthén & Muthén, 1998–2012). The only constraint was that participants were required to have a minimum of two out of the nine possible teacher reports of aggression. This decision was made out of a desire to include as many participants as possible, even with partial data. Given the length of the study and the

large sample size, we did not want to bias the sample against students who may have moved away over the course of the study.

To assess the fit of the trajectory models we used methods developed for mixture models. We assessed the reliability of the results of the models by computing the average posterior probability of assignment (AvePP) and the odds of correct classification (OCC; Nagin, 2005). These are both based on participants being assigned a probability of being in a class, *j*, through the estimation process, within the aggression type being estimated. The AvePP is a measure of the reliability of the model determined by averaging the actual (posterior) probability of being assigned to the class to which the student is eventually assigned. The OCC for class *j* is computed by:

$$OCC_j = \frac{AvePP_j/(1 - AvePP_j)}{\hat{\pi}_j/(1 - \hat{\pi}_j)}.$$

In this formula, the numerator is the odds of correct assignment based on the average posterior probability and the denominator uses the estimated population proportion of class *j*, $\hat{\pi_j}$, and provides an estimate of what the odds are of a participant being classified in class *j* if they were randomly assigned. Thus, a higher OCC suggests better classification by the model compared to just randomly assigning students to a class. The guidelines developed by Nagin (1999, 2005) state that an AvePP of assignment of 0.70 or greater for each class is acceptable as well as having an OCC greater than five for each group.

We then estimated the effect of the trajectories from the previous step on the outcomes of interest. As part of the analytic strategy we always tested for gender differences separately from, and then included with, the trajectories. We used structural equation modeling to test the relationship between prosocial trajectory groups and adjustment outcomes where we had multiple indicators (i.e., internalizing and externalizing behaviors). In these cases if the measurement model was not exactly identified then the fit of the model was assessed based on a χ^2 test (prefer $p > .10$), the root mean square error of approximation (prefer RMSEA<. 08), and the comparative fit index (prefer CFI > .95).

The metric of our indicators varied, which led to different estimation approaches. In particular the internalizing indicators were censored and the externalizing indicators included two categorical and one continuous variable leading us to employ a robust weighted least squares estimator (WLSMV: Muthén & Muthén, 1998–2012). We first present results examining internalizing problems and then move to externalizing behaviors. We then present analyses examining the relationship between prosocial trajectories and borderline and maladjustment. Structural equation modeling was not necessary with these latter two outcomes because they were measured by single indicators. In addition, we employed a group analysis by gender and contrasted the results where possible. The outcomes analyses were conducted using Mplus (Muthén & Muthén, 1998–2012).

Descriptive Statistics

Descriptive statistics and correlations are presented in Table 1, with values for girls above the diagonal and values for boys below. The overall pattern of correlations showed significant, positive relations between different teachers' ratings of participants' prosocial behavior, even across many years. There were positive associations between the various outcome variables as well as negative relations between the outcome variables and prosocial behavior.

Growth models

We began by constructing a multilevel (hierarchical) linear model for prosocial behavior across grades four through twelve (n=284). Although we built both linear and quadratic versions of this model, in anticipation of the mixture model below we illustrate the quadratic version. Let y_{it} be the prosocial behavior variable for the i^{th} child in the t^{th} grade and G be the grade level (4 – 12). Then the initial growth model, shown as a mixed linear model, was

$$y_{it}=\beta_{00}+\beta_{10}G_{it}+\beta_{20}G_{it}^2+r_{0i}+\varepsilon_{it} \quad (1)$$

where the β's are the parameters for the intercept and growth variables, the r is the random error on the intercept, and ε is the (residual) error term for the equation. The model reflects the estimation results that found nonsignificant variances for the linear and quadratic parameter estimates. We plot both the actual observations for each student and the estimated regression line from this model in Figure 1. It is clear that the average behavior captured by the model, though significant (β_{00}, β_{10}, β_{20} < .05), does not capture the heterogeneity of the individual behavior very well.

Mixture models

An alternative way to capture the heterogeneity is through a group-based analysis. Following Nagin (1999) we estimated unconditional linear and quadratic trajectories for classes of one through five for grades 4–12. We first compared the mixture models with different numbers of classes and polynomial degrees using the Bayesian Information Criterion (BIC) that sought the lowest BIC (Nagin, 2005). Among the linear models the four-class model was favored and among the quadratic models the three-class model was supported. For both the linear and quadratic models we constructed a likelihood ratio test of four classes versus three, and then of three classes versus two, with results that supported the three-class conclusion for both the linear and quadratic model (p > .10; Muthén & Muthén, 1998–2012). Finally we compared the three-class linear and quadratic model and found that the quadratic BIC was lower. Additionally, the intercept was significant across the three classes of the linear model, but these same intercepts were significant in the quadratic model along with both the slope and quadratic term for one of the classes. For these reasons our analysis proceeded with a three-class, quadratic model: a low prosocial trajectory (36 boys and 17 girls), a medium prosocial trajectory (78 boys and 69 girls), and a high prosocial group (22 boys and 62 girls). Furthermore, as discussed above, to assess the fit of this three-class model we calculated the AvePP and OCC for each model. In each case the guidelines of AvePP greater than 0.70 and OCC greater than five was met. Figure 2 illustrates the estimated trajectories against the observed trajectories for prosocial behavior.

Outcomes analysis

The analysis of outcomes began with a determination of the metric of the indicators of the outcome available. The metric varied in part with the reporter, with the parent and teacher reports being categorical whereas the target child indicators varied depending on the indicator. The estimation techniques used accounted for the various metrics. In all structural equation models all measurement loadings were significant ($p<.05$) and the focus below is on the structural coefficients. The results for unstandardized and standardized parameter estimates are given in Table 2.

Predictor Variables—Preliminary multinomial logit analyses examined whether gender, ethnicity, family income, and parents' marital status predicted trajectory membership. Relative to the low prosocial group, being female (odds ratio = 8.35, $p<.01$) and having married parents (odds ratio = 3.33, $p<.05$) both predicted membership in the high prosocial group whereas only being female (odds ratio = 2.40, $p<.05$) increased the likelihood of being in the medium group. Other variables were not significant ($p> .10$).

Internalizing symptoms—Internalizing symptoms were measured by the three target child indicators of anxious-dependent, withdrawn-dependent, and somatic complaints that were treated as censored variables, though results were the same when the one less clear-cut case, withdrawn-dependent, was treated as continuous. Being female was not significant in either model, but when trajectories were included we find that being in the high prosocial trajectory predicted lower internalizing symptoms relative to the low trajectory group. To determine if there was heterogeneity due to gender in the trajectories we performed a group analysis holding invariant the measurement model (loadings). We found that the prosocial trajectories had no effect for males but being in the high trajectory prosocial group for females was associated with lower internalizing symptoms ($\beta = -.57$; $p < .01$).

Externalizing symptoms—Externalizing behaviors were measured by the categorical parent and teacher indicators of rule breaking and aggressive behavior along with the target child continuous version of these indicators. Reporter effects were captured by allowing the indicators for the same reporter to be correlated. When externalizing symptoms were regressed on the female binary the relation was found to be negative and significant. However the gender effect disappeared when the trajectories are added, with being in either the medium or the high prosocial trajectory predicting less externalizing behavior compared to being in the low trajectory group. Neither a group analysis by gender nor an interaction with the gender binary was possible due to the estimation requirement that the categorical metric of the four parent and teacher indicators of externalizing have the same categories for males and females. For example, the parent aggressive behavior indicator had ten categories but there were some values that only girls had and others that only boys had. We experimented with reducing the number of categories to allow for there to be no null cells, but the distortion of the data, for example reducing the number of allowable categories from ten down to four, led to obvious distortions of the distributions.

Borderline personality features—Borderline features were measured by a single categorical variable leading to a multinomial logit model. However, because though the

metric might also have resulted in the variable being considered censored, we also estimated a Tobit model leading us to confirm that we found the same results. We found the female binary to be nonsignificant with or without the trajectories, but we found that being in the high prosocial trajectory group was associated with reduced borderline features compared to the low trajectory group. We were then able to construct a group analysis by gender and found that there was some heterogeneity in the trajectories. The trajectory groups were nonsignificant for boys but we found that being in the high prosocial trajectory for girls related to lower borderline symptoms ($\beta = -.38$; $p < .05$).

Maladaptive narcissism—Maladaptive narcissism was a single-indicator continuous variable leading to estimation by ordinary least squares. Although being female led to a lower level of maladaptive narcissism, this effect became only marginally significant ($p = .06$) when the prosocial trajectories were added, both of which were nonsignificant. A group analysis found all trajectories for both males and females were nonsignificant ($p > .10$) suggesting no evidence of heterogeneity by gender.

Discussion

Overall, these results supported our primary hypothesis that children follow stable prosocial trajectories across grades 4 through 12. Three distinct prosocial trajectories were identified: stable high, stable medium, and stable low. Regarding the outcomes associated with membership on a particular trajectory, our results partially supported our hypotheses. As expected, being on a medium or high prosocial trajectory was associated with significantly less externalizing behavior than the low trajectory. However, being on a high prosocial trajectory was found to be associated with lower internalizing symptoms for girls but not boys, which was contrary to our prediction. Also as expected, being on a high prosocial trajectory was associated with reduced borderline personality features compared to the low prosocial trajectory; however, no association was found between trajectory membership and maladaptive narcissism.

Three linear, stable trajectories emerged from our results. Most participants followed a medium trajectory, whereas 19% followed a low and 19% followed a high prosocial trajectory. Although the low prosocial trajectory was not especially low—the mean rating hovered around 2.75 out of 5—it was significantly lower than the middle and high. Despite annual changes in teachers and transfers to different schools over the nine-year period, teachers' reports of participants' prosocial behavior were remarkably consistent over time. Such consistency amongst different reporters over a significant span of development provides strong endorsement for the view that prosocial behaviors are relatively stable features of personality (Penner, et al., 1995; Eisenberg et al., 1999). Furthermore, the middle and low trajectories revealed slight decreases in prosocial levels over time, in particular between 5^{th} and 10^{th} grades. These findings are consistent with previous research, which have observed some decline in prosocial behavior during adolescence (Nantel-Vivier et al., 2009; Côté, et al., 2002; Carlo, et al., 2007). Interestingly, however, during 11^{th} and 12^{th} grade, all three trajectories show slight increases in prosocial behavior, similar to the rebound observed by Carlo, et al (2007).

Contrary to our expectations, high prosocial behavior was found to be associated with lower internalizing symptoms in grade 12 for females only. Our expectations were guided primarily by the only other study, to our knowledge, that has analyzed the relationship between prosocial trajectories and internalizing outcomes (Nantel-Vivier, et al., 2010). That study found a negative correlation between prosocial behavior and depression, but a complex relationship between prosocial behavior and anxiety. Our results did not find a relationship between prosocial behavior and internalizing symptoms in males, but did find an inverse relationship in females, perhaps because for girls especially, behaving in a prosocial manner may reduce stress in interpersonal relationships. The previous study used "the person most knowledge about the child" to assess internalizing symptoms, whereas ours used self-report to assess these variables. Therefore, different report strategies may explain in part these inconsistent findings. The previous studies that instead found a positive association between high levels of caring or moral concern and internalizing symptoms in females did not study developmental trajectories (Gjerde & Block, 1991; Gore, et al.,1993). Consequently, it is possible that different methodologies at least partially explain these divergent results.

As expected, higher levels of prosocial behavior predicted less externalizing behavior. Membership on both the medium and high prosocial trajectories was negatively related to aggressive and rule breaking behavior in grade 12. These findings replicate earlier research that has revealed a robust inverse relationship between externalizing behavior and prosocial behavior (Bandura, et al., 2001; Samson, et al., 2012; Choi, Johnson, & Johnson, 2011). Moreover, our results mirror those found by the limited previous longitudinal research on prosocial trajectories and aggressive behavior (Nantel-Vivier, et al., 2010). However, although this previous study relied solely on a person close to the child to report on externalizing behavior, our study included self, parent, and teacher-reports. Interestingly, self-report of externalizing behavior provided the most consistently significant evidence of a negative correlation between externalizing and prosocial behavior. It is also worth noting that the previous study focused exclusively on physical aggression, whereas ours also included rule breaking as an additional measure of externalizing behavior evaluated by all three types of informants. Thus, our study offers strong evidence for the inverse relationship between these two constructs across several key years of development.

Being on the high prosocial trajectory was found to correlate with lower rates of borderline personality features in girls but not boys. Given evidence that prosocial behavior is predictive of positive future social adjustment (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; Crick, 1996), it seems possible that being on a high prosocial trajectory is protective against both internalizing problems and borderline personality features by way of positive peer relations. Here again, perhaps this relation held for girls because girls as a group are more at risk for borderline features and behaving prosocially with peers may reduce stress and drama in their interpersonal relationships.

Although, to the best of our knowledge, no previous research has examined prosocial trajectories and features of narcissism, maladaptive narcissism has been found to correlate with externalizing problems (Underwood, et al., 2011). However, our research did not provide support for a relationship between high prosocial behavior and maladaptive

narcissism. Given the recent debate amongst clinical psychologists about whether or not to eliminate pathological narcissism from the most recent edition of the DSM-5 (APA, 2013), it appears that narcissism is increasingly being viewed as more normative. As a result, it is possible that such perceptions of normalcy may in part account for our results. Further research is warranted to determine how prosocial behavior may relate to features of narcissism.

Certain aspects of this study's methodology somewhat limit the interpretability of results. The sample was distributed relatively equally across 15 elementary schools during the fourth grade year, however over the course of this study it was not uncommon for participants to move out of their original school, school district, or in some cases out of the state. Ratings of prosocial behavior were collected from over 645 teachers over the course of nine school years, dispersed across 181 individual schools. In any given year, each teacher on average rated fewer than three participants. Although this suggests that the sample was largely dispersed throughout the larger metropolitan area (and beyond), the possibility remains that these data were not independent. Future analyses should examine if nested models would provide additional insights into the development of prosocial behavior.

Relatedly, our small sample and some participant attrition across time may have limited the power to detect smaller effects on outcomes. Furthermore, it is noteworthy that as students got older, the teacher rating their levels of prosocial behavior observed them for less time over the school day. It also may have been the case that some selection bias occurred with regard to the particular teachers chosen to evaluate students during high school, because students were allowed to choose the teacher who "knew them best". It is possible that some students chose a teacher who advised them on a "prosocial" extracurricular activity, such as student government or yearbook. Consequently, certain teachers' judgments might not accurately reflect student tendencies towards prosocial behavior in general. And yet, the fact that limited daily observations still were significantly correlated with particular outcomes years later suggests that prosocial trajectories do relate to psychosocial outcomes. Another limitation is the brevity of the prosocial subscale; using a more in depth assessment would have yielded more precise trajectories as well as outcome correlations. Similarly, even though the prosocial subscale was modified slightly in order to include developmentally appropriate language, it is possible that using the same subscale across all nine years was less effective at eliciting accurate evaluations of participants than if multiple developmentally-targeted scales had been employed.

Finally, because we did not measure externalizing, internalizing, borderline, and narcissistic features at the beginning of the study, we cannot conclude that being on a particular prosocial trajectory directly led to the psychosocial outcomes observed in twelfth grade. However, some previous research has found prosocial behavior in early childhood to predict fewer externalizing problems in early adolescence, and externalizing problems in early childhood to be predictive of lower levels of prosocial behavior later on (Hay & Pawlby, 2003). Consequently, future research should attempt to address this limitation in our study by also measuring outcome variables at the beginning and end of the study, which would help illuminate whether in fact prosocial behavior leads to fewer problem behaviors, or if

problem behaviors in early and middle childhood shape which prosocial trajectory a child develops along.

Despite these shortcomings, this study represents a significant extension of our understanding of the development of prosocial behavior across middle childhood and adolescence. This research captured two critical developmental transitions: from elementary school into middle school and from middle school into high school. The use of teacher-report to assess prosocial behavior provides a more objective evaluation than self- or parent-reports. This methodological strength highlights how significant it is that all three trajectories remain so stable and consistent over time. Another strength of this study is the use of self, parent, and teacher-report to assess externalizing behaviors.

Given that the propensity for prosocial behavior seems stable and relates to positive adjustment, future research should continue to search for developmental antecedents of individual differences in prosocial behavior and to investigate how these highly prosocial youth function in their peer groups and school communities. Similarly, future research should consider the possible relationship between prosocial trajectories, adjustment, and developmental transitions such as puberty, identity formation, or peer-group identification. What is more, examination of individual differences in these areas might also provide insight as to why particular children follow one prosocial trajectory instead of another or adjust more or less successfully to the developmental expectations of their age group.

Moreover, given that we observed considerable heterogeneity within the trajectories, another interesting direction for future research would be to examine trajectory subsets that varied from the general trends. For instance, even though we observed stable trajectories overall, perhaps some individuals within our data showed significant linear changes in their prosocial behavior over time. Examining those individual trajectories against their psychosocial outcomes might serve as interesting case studies to investigate how personality or developmental change occurs, or why the level of prosociality during childhood changes more for some children than others.

Overall, this research suggests that, contrary to much of the literature within the field of social psychology, prosocial behavior is not simply an outcome of the right combination of environmental variables, but a more stable interpersonal tendency. What is more, an individual’s particular inclination to engage prosocially appears to remain relatively consistent between third and twelfth grades. However, such findings do not necessarily indicate that prosocial behavior is impermeable to environmental influences. Innumerable influences within the family system, physical environment, daycare interactions, or early education experiences could play a role in shaping a child’s inclination toward prosocial behavior. Nevertheless, these results do suggest that parents and educators should not underestimate the lasting impact that early experiences may have on a child’s willingness to help, cooperate with, and consider others, and therefore they should not delay in fostering these inclinations in the early years of life.

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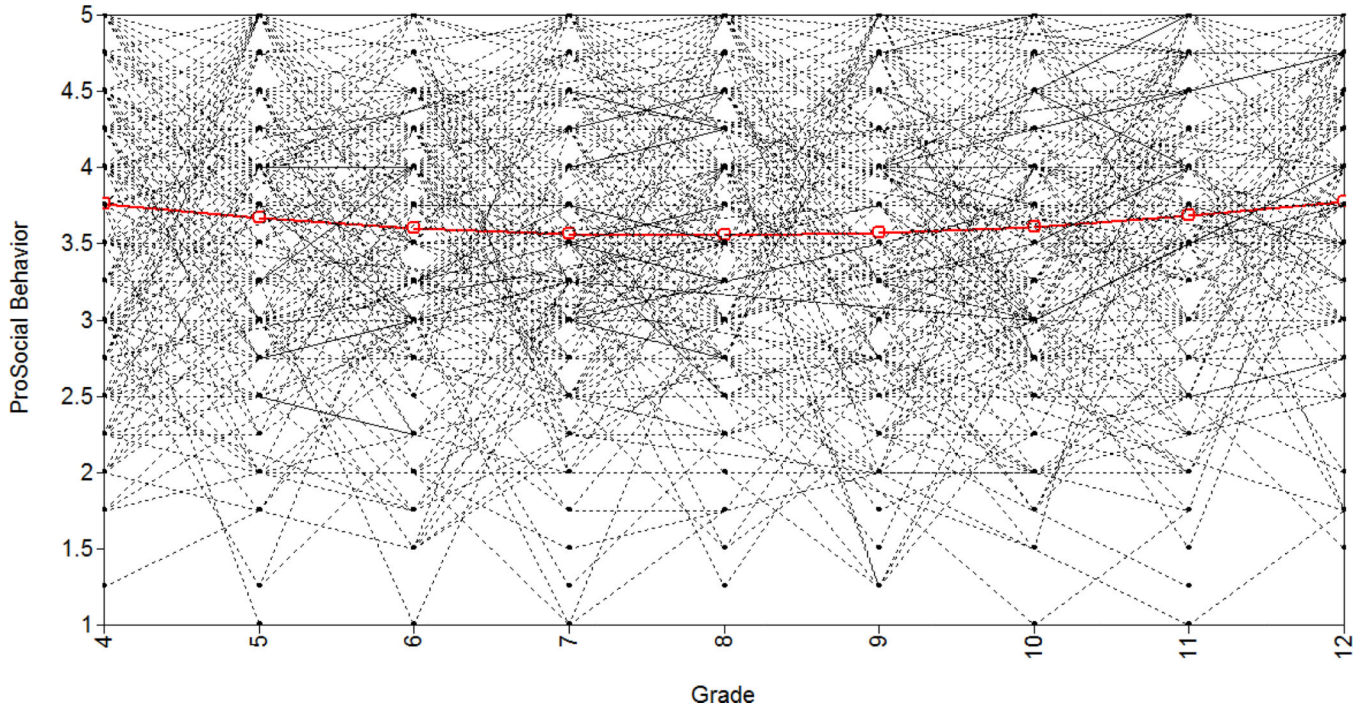

Figure 1.
One-class, random intercept, quadratic model (HLM) of prosocial behavior across time

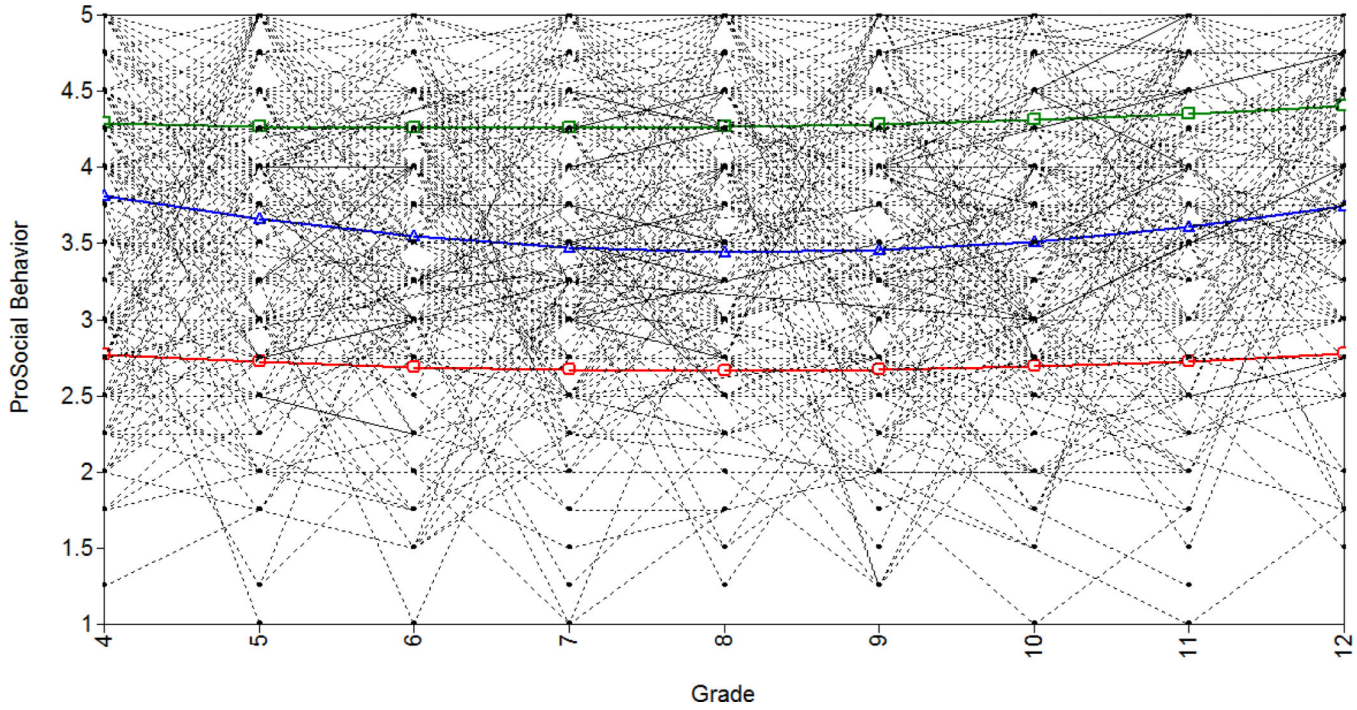

Figure 2.
Three-class, latent class quadratic growth model of prosocial behavior across time

Table 1

Correlations Between Ratings of Prosocial Behavior, Internalizing Behaviors, Externalizing Behaviors, Borderline Personality Features, and Maladaptive Narcissistic Personality Features by Gender (girls above the diagonal, boys below)

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Mean	SD
1	Tea - Prosocial Rating GR4	-	**.45****	**.24***	**.32****	**.43****	**.27***	**.33***	**.52****	.19	−.11	−.22	−.07	**−.32***	−.19	**−.33***	−.16	−.06	−.14	−.25^{t}	−.21	3.82	.86
2	Tea - Prosocial Rating GR 5	**.28***	-	**.36****	**.5****	**.35****	**.34****	**.26***	.23	.17	−.15	−.16	.05	−.24*	−.13	−.01	−.02	**−.38****	**−.4****	−.19	−.04	3.75	.93
3	Tea - Prosocial Rating GR6	**.34****	**.49****	-	**.27****	**.27****	**.44****	.18	**.48****	**.34***	−.11	−.16	**−.26***	−.19	−.15	−.16	−.19	−.12	−.07	−.22*	−.13	3.84	.80
4	Tea - Prosocial Rating GR7	**.47****	**.45****	**.38****	-	**.37****	**.47****	**.36****	**.43****	.15	**−.3***	**−.33***	−.25^{t}	**−.36****	−.18	−.09	−.01	−.16	**−.42****	**−.38****	.05	3.83	.80
5	Tea - Prosocial Rating GR 8	**.36****	**.28***	**.29****	**.40****	-	**.28***	.22^{t}	**.58****	**.41****	.02	−.08	−.10	**−.33****	−.17	−.10	−.06	−.03	−.17	−.23^{t}	−.17	4.01	.80
6	Tea - Prosocial Rating GR9	**.44****	**.28***	.15	**.40****	**.27***	-	**.5****	**.46****	**.37****	−.21	**−.4****	−.16	**−.31***	−.08	−.22	.01	−.22	−.18	**−.28***	−.06	3.70	.85
7	Tea - Prosocial Rating GR 10	.22^{t}	.17	.13	**.27***	**.29***	.16	-	**.27***	**.34****	−.18	**−.28***	.00	**−.25***	−.12	**−.37****	−.15	−.23^{t}	−.15	**−.33****	−.13	3.78	.92
8	Tea - Prosocial Rating GR 11	**.47****	.11	.08	.12	**.33****	.24^{t}	**.41****	-	**.4****	**−.24***	**−.37****	**−.44****	**−.27***	**−.23***	−.18	−.13	−.17	−.18	**−.38****	−.13	3.90	.90
9	Tea - Prosocial Rating GR 12	**.33***	**.35****	**.28***	**.37****	**.33***	**.29***	.14	**.33***	-	.00	−.10	−.18	−.16	.01	**−.38****	**−.27***	**−.27***	**−.31****	−.18	−.09	4.06	.84
10	Self - Anxious Dep. GR 12	−.06	.03	−.07	−.11	.16	−.13	−.06	.06	**.26***	-	**.65****	**.38****	**.46****	**.54****	.09	.06	.18	.10	**.43****	−.18	3.80	3.55
11	Self-Withdrwan Dep. GR 12	−.06	−.07	−.05	−.14	.05	−.08	−.19	.03	.00	**.63****	-	**.29****	**.44****	**.4****	**.27***	.21^{t}	.12	.00	**.42****	**−.22***	2.81	2.58
12	Self- Somatic Comp. GR 12	**−.30***	−.05	−.09	−.23^{t}	−.04	**−.28***	.12	.2^{t}	.07	**.49****	**.27****	-	**.35****	**.4****	.11	.15	.04	.18	**.32****	−.03	2.45	2.80
13	Self- Rule Breaking GR 12	−.26^{t}	−.10	.11	**−.29***	−.22^{t}	−.14	−.07	.00	−.08	.2^{t}	**.24***	**.33****	-	**.65****	**.45****	**.26***	**.39****	**.37****	**.55****	**.22***	4.34	3.90
14	Self - Aggressive Beh. GR 12	−.10	.02	−.04	−.16	−.07	−.12	−.13	−.09	.07	**.53****	**.41****	**.41****	**.52****	-	.2^{t}	**.24***	.20	.08	**.52****	**.24***	5.06	4.34
15	Par - Rule Breaking GR 12	**−.34***	**−.40****	−.24^{t}	**−.37****	−.13	−.11	−.12	−.17	**−.25***	.09	.14	.18^{t}	**.41****	.18	-	**.69****	.07	.08	**.48****	.15	1.52	2.58
16	Par-Aggressive Beh. GR 12	**−.33***	**−.34****	−.22*	**−.29***	−.15	−.20	−.10	−.21^{t}	−.15	.10	.10	**.23***	.18	.10	**.85****	-	−.05	−.08	**.26***	.15	2.38	4.14
17	Tea - Rule Breaking GR 12	−.18	−.23^{t}	−.24^{t}	−.07	−.10	−.14	−.12	−.14	**−.41****	.01	.01	.06	.11	.05	.05	.04	-	**.63****	.11	.09	.75	1.23
18	Tea-Aggressive Beh. GR 12	−.14	.03	−.23^{t}	−.05	−.11	−.16	−.08	**−.28***	**−.40****	−.04	−.02	.05	.03	.08	.07	**.28***	**.56****	-	.09	.09	.96	2.33
19	Self- Borderline Features GR 12	−.05	−.18	−.2^{t}	−.06	.04	−.13	.01	.07	.09	**.47****	**.45****	**.38****	**.34****	**.47****	**.3****	**.23***	.01	.00	-	.11	2.38	2.47
20	Self-Maladaptive Narc. GR12	.16	.04	.09	−.02	−.04	.29*	−.17	−.10	.02	−.03	−.19^{t}	.12	.16	.17	−.05	−.06	−.02	−.03	−.08	-	36.45	6.95
	Mean	3.45	3.62	3.37	3.34	3.30	3.02	3.21	3.48	3.81	3.14	3.00	2.01	5.90	5.39	2.94	2.85	1.11	1.33	2.23	39.12		
	SD	.92	.92	.90	.97	.79	1.01	.87	.97	.86	3.40	2.57	3.00	4.02	3.90	4.26	4.66	2.20	2.85	2.38	6.46		

^{t} p < .1,

* $p < .05$,

** $p < .01$

Table 2

Gender and Prosocial Trajectories Across Grades 4 through 12 as Predictors of Adjustment Outcomes

Predictor	Internalizing		Externalizing		Borderline		Maladaptive Narcissism	
	Estimate	Standard Error	Estimate	Standard Error	Estimate	Standard Error	Estimate	Standard Error
Step 1:								
Female	.39 (.1)	.67	−.26*(−.46)	.14	.04 (.04)	.16	−2.65**(−.38)	1.03
Step 2:								
Female	1.11 (.29)	.65	.05 (.07)	.15	.24 (.24)	.18	−2.10 (−.31)	1.11
Medium Prosocial	−1.14 (−.3)	.88	−.43*(−.63)	.19	−.14 (−.14)	.22	.91 (.13)	1.43
High Prosocial	−2.77**(−.73)	1.01	−1.29**(−1.89)	.31	−.65**(−.65)	.27	−1.10 (−.16)	1.66
Fit statistics for final model, where appropriate								
N	172		182		173		173	
χ^2 p-value	.62		.26		N/A		N/A	
CFI	1		.99		N/A		N/A	
RMSEA	0		.03		N/A		N/A	

Note: Results present unstandardized and (standardized) parameter estimates along with fit indices for models fitted as structural equation modeling

* $p < .05$,

** $p < .01$