Longitudinal Relationships Among Child School Engagement, Parental Monitoring, and Child Prosocial Behavior: A Child-Parent Synergistic Mechanism

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Abstract

Numerous contextual factors have been identified that impact the development of children's prosocial behavior, yet the influence of child-initiated factors on prosocial behavior and its underlying mechanism remains unclear. This study employed three longitudinal models to examine in depth how children's school engagement may promote the development of their own prosocial behavior. Three-wave longitudinal data from 4691 children ($M_{age} = 9.480$, $SD = 0.507$; 48.2% female) with 2-year intervals were used. Sequentially, a cross-lagged panel model, a random intercept cross-lagged panel model, and a parallel process latent growth model were constructed. The findings indicated that children's school engagement consistently predicted the future level, dynamic changes at within-person level, and long-term trends in their prosocial behavior, and these longitudinal relationships were partially mediated by parental monitoring. These results reveal a child-parent synergistic mechanism for the development of prosocial behavior, wherein children's school engagement both directly promotes their own prosocial behavior and simultaneously enhances prosocial behavior through eliciting increased parental monitoring.

Keyword Child school engagement · Parental monitoring · Child prosocial behavior · Cross-lagged panel model · Random-intercept cross-lagged model · Latent growth model

Introduction

Prosocial behavior refers to a broad category of behaviors beneficial to others (Penner et al., 2005). It is related to a range of adaptive outcomes, including positive interpersonal relationships, good mental health, and behavioral well-being (Van der Graaff et al., 2018; Varma et al., 2023). Childhood is a critical period for the development of prosocial behavior (Chernyak & Kushnir, 2018). A growing body of evidence has identified that contextual factors, such as family resources, peer groups, and school environment, are critical to the development of prosocial behavior (e.g., Knafo & Plomin, 2006; Marengo et al., 2018). However, less is known about how child-initiated factors affect prosocial behavior, and whether such factors may influence the

contexts and thus indirectly influence the child's own prosocial development. This study attempts to fill this gap and investigate whether children can act as agents of positive change that shape their contexts and impact their own developmental outcomes.

Child School Engagement and Prosocial Behavior

Children spend most of their time in school (Nie et al., 2024), and their school engagement reflects their initiative (Christenson et al., 2012). School engagement is a multifaceted construct of school experience, consisting of students' behavioral, emotional, and cognitive components (Skinner et al. 2009), which mirrors children's inherent desire to learn and excel (Christenson et al., 2012; Demirci, 2020). Prior studies have found a potential link between child school engagement and prosocial behavior (e.g., Brass et al., 2022; Demirci, 2020; Venta et al., 2019).

Some studies suggest that prosocial behavior is a predictor for behavioral school engagement (Brass et al., 2022), classroom attention (Wentzel et al., 2004), academic

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achievement (Brouwer & Engels, 2021), and academic investment (Carlo et al., 2011), which all fall under the domain of school engagement. For example, a longitudinal study showed that 3rd-grade children's prosocial behavior assessed by self-report, peer nominations, and teacher ratings significantly predicted their academic achievement indexed by the average grade of six courses five years later (Caprara et al., 2000). Another study using path analysis indicated that adolescents' prosocial behavior significantly related to their academic investment including participation in academic activities, school attachment, and academic plans (Carlo et al., 2011). A possible explanation for these findings is that individuals who engage in prosocial behavior may tend to conform to and reinforce social norms in their school lives by actively participating in school activities, resulting in better performance in school (Eisenberg et al., 2015; Carlo et al., 2011). Moreover, a child who engages in prosocial behavior may experience a supportive social and learning environment in which they feel accepted and helped by their classmates, as well as by their teachers, which may contribute to stronger engagement in school activities.

Recently, an emerging body of studies are starting to treat school engagement as a predictor for children's prosocial behavior (Demirci, 2020; Venta et al., 2019). For example, a cross-sectional study using hierarchical regression analysis found that school engagement positively facilitated prosocial behavior after controlling for peer and parent attachment (Venta et al., 2019). Another cross-sectional study using pathway analysis found that school engagement promoted social competence, which conceptually overlapped with prosocial behavior (Demirci, 2020). Although these studies are cross-sectional and cannot prove causality, this direction of relationship from school engagement to prosocial behavior appears theoretically sound. According to the Model of Motivational Dynamics on school engagement (Christenson et al., 2012), school engagement could serve as a protective factor, a positive force, or an energetic resource to promote positive youth development, and protect children from risks that emerge during early adolescence, such as delinquency and gang involvement (Wang & Fredricks, 2014; Paulus, 2018; Olivier et al., 2020). In addition, childhood is a critical period for behavioral plasticity and developmental changes. Engaging in school activities and education provides individuals with prosocial behavioral templates or normative social schemas in the daily life (Crick & Dodge, 1994), which may contribute to the formation of stable prosocial behavior patterns. Furthermore, long-term stable positive social behaviors, including prosocial behavior, often originate from habitual positive experiences encountered in daily life (Eisenberg et al., 2015). Prosocial behavior constitutes a stable and well-formed behavioral pattern that tends to be cultivated over a longer period of time (van Kleef & Lelieveld, 2022; Hepach & Warneken, 2018; House, 2018), whereas school engagement represents a positive daily experience that is relatively more malleable and susceptible to changes in environment (Goemans et al., 2018; Fredricks et al., 2004; Christenson et al., 2012). Thus, it is plausible that school engagement may play a role in shaping prosocial behavior.

Existing studies suggest a potentially reciprocal relationship between school engagement and prosocial behavior. However, most of these studies are cross-sectional (e.g., Brass et al., 2022; Demirci, 2020; Venta et al., 2019), and the very limited longitudinal studies (Caprara et al., 2000) did not account for contemporaneous associations and autoregressive effects. As such, the direction of causality in the relationship between the two constructs remains unclear. Further rigorous examinations into the dynamic relationship between children's school engagement and prosocial behavior are necessary to elucidate the nature of this association.

Mediating Role of Parental Monitoring

While the directionality of relationship between school engagement and prosocial behavior remains an open question, many studies have examined the impact of contextual factors including parental monitoring on prosocial behavior. Parental monitoring refers to parents' knowledge and care of their adolescents' school and social activities and whereabouts (Lowe & Dotterer, 2013). Although this factor is mainly studied as the predictor for negative outcomes such as risk behavior and delinquency (Yoo, 2017; Vaughan et al., 2022), there are also a few studies that have examined its relationship with prosocial behavior (Maiya et al., 2020; Yoo et al., 2013; Carlo et al., 2010; Krishnakumar et al., 2014). For example, a cross-sectional sequential regression analysis found that both maternal monitoring and paternal monitoring positively predicted adolescent social initiative (Henke et al., 2011). Another longitudinal study found that maternal involvement (e.g., frequent mother-child communication) positively predicted prosocial behavior four years later (Davis et al., 2018). It is possible that parents' attention to their children provides more meaningful opportunities to regulate their children's behavior and guide them to conform to social norms (Bray et al., 2022). At the same time, parents' increased understanding of their children allows them to promptly discover and eliminate risk factors, providing a safe environment for their children's positive development (Maiya et al., 2020).

School engagement may influence positive parenting practices, according to the Model of Motivational Dynamics on school engagement (Christenson et al., 2012), which posits that school engagement is an external manifestation

of an individual's positive intrinsic motivation, and children's good performance in school can elicit more positive interactions and attention from parents (Christenson et al., 2012; Hornby & Lafaele, 2011). The increased parent-child interactions may enhance open parent-child communications wherein the child would disclose more and the parent would learn more about the child's school and social life, thus promoting more parental monitoring (Stattin & Kerr, 2000). Additionally, children's high school engagement, unlike poor performance which may bring psychological pressures to parents, is a positive psychological resource for parents, encouraging them to be more attentive and dedicated to their children's upbringing (Cox & Paley, 2003; Christenson et al., 2012). Previous studies on family-school interventions have shown that parental monitoring as a kind of recognized and typical family involvement practice (Véronneau & Dishion, 2010; Garbacz et al., 2018) is associated with a range of social, emotional and behavioral school engagement in school-aged children (Sheridan et al., 2019; Smith et al., 2020). These empirical findings provide initial evidence for the association between school engagement and parental monitoring.

Given the predictive effect of parental monitoring on prosocial behavior, as well as the potential mechanism in which children's salient/poor school engagement may attract/suppress more of parents' attention to and knowledge about their children, parental monitoring may play a mediating role between child school engagement and child prosocial behavior. However, this chain of child-parent synergistic mechanism leading child prosocial behavior has yet to be examined in both cross-sectional and longitudinal studies.

Current Study

Previous studies have mainly focused on the influence of contextual factors on child prosocial behavior, but there is a lack of examination on the influence of child-initiated factors on prosocial behavior and its underlying mechanism. This study positioned children as agents of positive change and postulated that factors initiated by children may influence contextual variables, thereby jointly contributing to the development of children's prosocial behavior. A large-scale longitudinal dataset was used to examine the dynamic relationships among child school engagement, parental monitoring, and child prosocial behavior. Cross-lagged panel model, random-intercept cross-lagged model, and parallel process latent growth model were conducted sequentially to more rigorously and systematically test the nature and driving mechanism of the relationship. It was expected that earlier levels of child school engagement would positively predict the subsequent levels of child prosocial behavior, while controlling for the autoregressive effects of the earlier levels of child prosocial behavior (Hypothesis 1a), and the levels of parental monitoring would mediate this relationship (Hypothesis 1b). The within-person changes in child school engagement were anticipated to positively predict subsequent change in child prosocial behavior (Hypothesis 2a), and the within-person changes in parental monitoring would mediate this relationship (Hypothesis 2b). This study also hypothesized that the long-term trend of child school engagement including the initial level and growth rate would positively predict the long-term trend of child prosocial behavior (Hypothesis 3a), and the long-term trend of parental monitoring would mediate this relationship (Hypothesis 3b).

Methods

Participants and Procedure

The data come from the 5.0 release of the ABCD study (https://abcdstudy.org). The ABCD study is a large open longitudinal investigation that tracks 9- to 10-year-olds from 21 sites across the United States. The study collected data from the children every two years (i.e., the baseline, the 2-year follow-up, and the 4-year follow-up). Participants across 21 study sites were recruited through public and private elementary schools (including charter schools), and the sampling approaches intended to yield a final sample representative of the population's demographic characteristics. The sample at Wave 1 comprised of 11,868 youth ($M_{age} =$ 9.480, $SD = 0.507$; 47.8% female; 52% White, 15% Black, 20.3% Hispanic, 2.1% Asian, 10.5% Other). Participants who did not have all three waves of data on key variables of interest were excluded from analysis. The final sample included 4,691 participants ($M_{age} = 9.480$, $SD = 0.507$; 48.2% female; 50.9% White, 15.1% Black, 21.1% Hispanic, 2.1% Asian, 10.8% Other). The three waves of data were collected from 2016 to 2018, 2018 to 2020, and 2020 to 2022, respectively, and the last wave of data was released in 2023. The human research protections programs and institutional review boards at universities participating in the ABCD project approved all experimental and consenting procedures, and all participants (assent) and their legal guardian provided written agreement to participate (consent). Participants who dropped out after Wave 1 were compared with participants who participated in all three waves, and the results indicated no significant differences at Wave 1 in school engagement ($M_{remained} = 13.079$, $M_{dropped\ out} = 13.003$, $t = 1.656$, $p = 0.098 > 0.05$), parental monitoring ($M_{remained} = 4.388$, $M_{dropped\ out} = 4.369$, $t = 1.850$, $p = 0.064 > 0.05$), and child prosocial behavior ($M_{remained} = 1.680$, $M_{dropped\ out} = 1.667$, $t = 1.745$, $p = 0.081 > 0.05$).

Measures

School Engagement

School engagement was assessed by the school engagement subscale of the school risk and protective scale (Arthur et al., 2007). The items describe the degree of participation in school activities (e.g., "I like school because I do well in class"). Child was required to choose the most suitable answer from 1(NO!) to 4 (YES!). If they think the statement is definitely true for them, they mark the (the BIG) YES!. If they think the statement is mostly true for them, they mark the (the little) yes. If they think the statement is mostly not true for them, they mark (the little) no. If they think the statement is definitely not true for them, they mark (the BIG) NO!. Composite reliability coefficient ω for this subscale was 0.786 at Wave 1, 0.829 at Wave 2, and 0.819 at Wave 3.

Parental Monitoring

Parents monitoring was measured by five items (adapted from Karoly et al., 2016; Shillington et al., 2005; DiClemente et al., 2001). The items focus on the parents' attention and knowledge for their child (e.g., "In an average week, how many times do you and your parents/guardians, eat dinner together?", "How often do you talk to your parent or guardian about your plans for the coming day, such as your plans about what will happen at school or what you are going to do with friends?"). Child rated each item on a 5-point Likert scale (1 = Never, 5 = Always or Almost Always). Higher average scores indicating higher levels of parental monitoring. Composite reliability coefficient ω for this measure was 0.704 at Wave 1, 0.750 at Wave 2, and 0.762 at Wave 3.

Prosocial Behavior

Prosocial behavior was assessed by three items (adapted from Goodman, 1997). These items describe the degree to which the child shows kindness to others (e.g., "I try to be nice to other people," I care about their feelings," "I am helpful if someone is hurt, upset, or feeling sick"). Children rated the items on a scale ranging from 0 (Not True) to 2 (Certainly True). The average scores of all items were calculated, with higher scores representing higher levels of prosocial behavior. Composite reliability coefficient ω for this measure was 0.778 at Wave 1, 0.811 at Wave 2, and 0.809 at Wave 3.

Statistical Analysis

R 4.2.2 (R Core Team, 2023) was used to perform descriptive statistics and correlation analysis and Mplus 8.3 (Muthén & Muthén, 2019) was used to construct measurement and structural equation models.

The following data screening and preliminary analyses were conducted. First, Harman's single factor test (Podsakoff et al., 2003) was used to assess common method bias. The first factor of the three waves of data accounted for 23.789%, 27.541%, and 27.339% of the total variation, respectively, all lower than 40%, indicating that there was minimal risk of common method bias. Second, to test the patterns of missing data, Little's MCAR test (Little & Rubin, 2002) was performed, and the results revealed that the data were missing at random ($\chi2 = 491.243$, $df = 466$, $p = 0.202 > 0.05$). Therefore, the Full Information Maximum Likelihood (FIML) estimation was used to handle missing values, which could produce unbiased and efficient parameter estimates using complete data information (Graham, 2009). Third, measurement invariance of school engagement, parental monitoring, and prosocial behavior was examined. Both $\Delta CFI \leq 0.01$ and $\Delta RMSEA \leq 0.015$ (Chen et al., 2008) between invariance tests are used as indicators of measurement invariance.

Three types of longitudinal models were sequentially constructed. First, the cross-lagged panel model (CLPM) was established to initially examine the dynamic relationships among the levels of among the three variables: that is, whether the level of one variable at a previous time point can predict the level of another variable at a later time point. Then, the random intercept cross-lagged panel model (RI-CLPM) was conducted to distinguish between-person and within-person effects (Hamaker et al., 2015), thereby identifying key variables that drive intra-individual changes. Although RI-CLPM seems superior to CLPM in assessing causality, it does not provide information about the consequences of between-person differences (Orth et al., 2021), as the between-person differences are linked through covariance, not lagged predictive pathways. Thus, both the CLPM and RI-CLPM were adopted in this study to examine the between-person and within-person prospective effects. Notably, the three variables were simultaneously included in the same dynamic system to control for their concurrent effects on each other. Specifically, the CLPM examines synchronous correlations, autoregressive and cross-lagged effects. The RI-CLPM examines autoregressive effects (stability paths), cross-lagged effects, between-person correlation (correlations among the random intercepts) and within-person correlation (concurrent associations). In RI-CLPM, autoregressive effects represent the within-person carry-over effects. Cross-lagged effects represent the within-person spill-over of the state in one domain into the state of another domain. Correlations between the random intercepts represent stable between-person associations. To find the best model that explains the relationships, models with parameters constrained to be equal across time were

Table 1 Descriptive Statistics and Correlations of Measures ($N = 4691$)

Variables	M	SD	1	2	3	4	5	6	7	8
1. Wave 1 SE	13.104	2.322								
2. Wave 2 SE	12.693	2.327	0.380[***]							
3. Wave 3 SE	12.119	2.286	0.254[***]	0.428[***]						
4. Wave 1 PM	4.395	0.506	0.307[***]	0.180[***]	0.149[***]					
5. Wave 2 PM	4.494	0.463	0.242[***]	0.337[***]	0.220[***]	0.375[***]				
6. Wave 3 PM	4.410	0.467	0.178[***]	0.248[***]	0.349[***]	0.278[***]	0.463[***]			
7. Wave 1 PSB	1.684	0.363	0.363[***]	0.194[***]	0.106[***]	0.278[***]	0.189[***]	0.137[***]		
8. Wave 2 PSB	1.720	0.360	0.233[***]	0.344[***]	0.171[***]	0.193[***]	0.351[***]	0.215[***]	0.339[***]	
9. Wave 3 PSB	1.664	0.376	0.191[***]	0.253[***]	0.327[***]	0.179[***]	0.252[***]	0.355[***]	0.255[***]	0.387[***]

SE Child School Engagement, *PM* Perceived Parental Monitoring, *PSB* Child Prosocial Behavior. There is a 2-year interval between waves.
[***]$p < 0.001$

Table 2 Model Fit Indices for Measurement Invariance in Longitudinal Data

Model	CFI	ΔCFI	SRMR	RMSEA (90% CI)	ΔRMSEA
Child school engagement					
Configural invariance	0.975		0.022	0.038 (0.034, 0.042)	
Metric invariance	0.973		0.026	0.037 (0.033, 0.040)	0.026
Perceived parental monitoring					
Configural invariance	0.971		0.028	0.025 (0.022, 0.029)	
Metric invariance	0.962	0.009	0.040	0.028 (0.025, 0.031)	0.003
Child prosocial behavior					
Configural invariance	0.998		0.010	0.012 (0.000, 0.020)	
Metric invariance	0.995	0.003	0.018	0.017 (0.010, 0.023)	0.005

CFI comparative fit index, *SRMR* standardized root mean square residual, *RMSEA* root mean square error of approximation, *CI* confidence interval

compared with unconstrained models. Model comparison results (see Appendix A) indicated that the fit of the constrained models was significantly worse than that of the unconstrained models, for both CLPM and RI-CLPM. As such, the unconstrained models were chosen as the final models. Finally, based on the directional relationship revealed in the RI-CLPM, a parallel process latent growth model (PP-LGM) was constructed to describe the long-term stable development trends of the child-parent synergistic mechanism. The factor loadings for each of the three indicators on the intercept growth factor were fixed to 1.0, and the loadings for the slopes were fixed to the time scores 0, 1, and 2.

In CLPM, gender, age, race, and annual household income were controlled as covariates on each variable in the three waves of data. In RI-CLPM, gender, age, race, and annual household income were used as control variables to predict the random intercepts. Bootstrapping procedure was used to calculate the mediation effect, sampling 2000 times. For structural equation models, comparable fit index (CFI; optimal values > 0.90), root-mean-square error of approximation (RMSEA; optimal values ≤ 0.08) and standardized root mean square residual (SRMR; optimal values ≤ 0.08) were used to measure model fit (Bentler, 1990; Hu & Bentler, 1999).

Results

Descriptive Statistics and Correlation

Means, standard deviations, and correlations for school engagement, parental monitoring, and prosocial behavior are shown in Table 1.

Measurement Invariance of Longitudinal Data

Configural invariance, Metric invariance, scalar invariance, and error variance invariance of school engagement, parental monitoring, and prosocial behavior were examined to assess whether these variables had measurement invariance over time. The results in Table 2 show that school engagement, parental monitoring, and prosocial behavior all reached configural invariance and metric invariance.
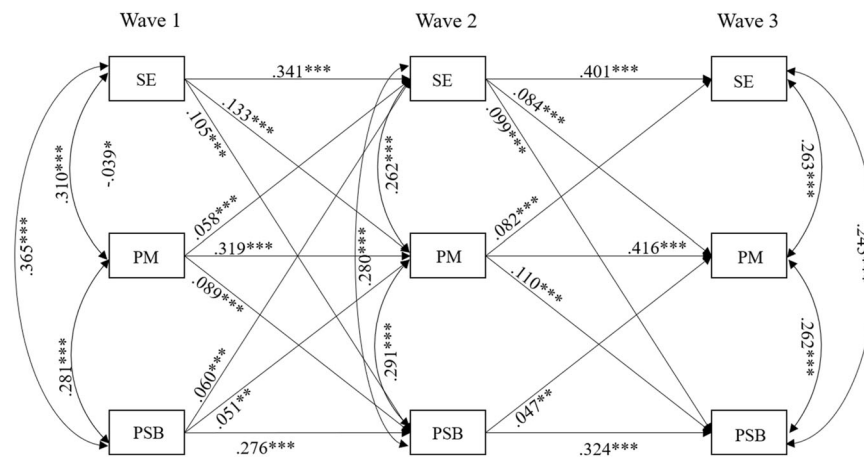
Fig. 1 The cross-lagged panel model involving child school engagement, parental monitoring, and child prosocial behavior after controlling for child age, gender, race, and annual household income. SE Child School Engagement, PM Perceived Parental Monitoring, PSB Child Prosocial Behavior. All parameters are standardized. Non-significant paths, error terms, intercepts, and covariance terms are not presented for concision. Significant covariates include age on parental monitoring at Wave 1 ($\beta = -0.032$, $p = 0.036$); gender on parental monitoring at Wave 1 ($\beta = -0.040$, $p = 0.009$) and Wave 3 ($\beta = -0.027$, $p = 0.043$); annual household income on school engagement at Wave 1 ($\beta = -0.039$, $p = 0.021$) and Wave 2 ($\beta = -0.034$, $p = 0.033$), and parental monitoring at Wave 1 ($\beta = -0.037$, $p = 0.036$) and Wave 2 ($\beta = -0.047$, $p = 0.002$). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Longitudinal Prospective Effect

To explore the dynamic relationships among the levels of child school engagement, parental monitoring, and child prosocial behavior, the auto-regressive cross-lagged panel model using data from all three waves was constructed. Autoregressive pathways were specified between the same variables, and cross-lagged pathways were set between different variables measured at different times. Concurrent residual correlations between two variables were also examined. The results of the cross-lagged panel model are shown in Fig. 1, and only significant paths among key variables are shown for concision. The model fits the data well, CFI = 0.980, SRMR = 0.019, RMSEA (90%CI) = 0.061 (0.053, 0.070). The results indicate that some bidirectional relationships do exist among the variables. Specifically, after controlling for autoregressive effects, a stable bidirectional relationship is observed between children's school engagement and parental monitoring. The standardized path coefficients indicate that the cross-lagged effect of school engagement on parental monitoring ($\beta_{\text{Wave 1 to Wave 2}} = 0.133$, $\beta_{\text{Wave 2 to Wave 3}} = 0.084$) may be greater than the reverse effect from parental monitoring to school engagement ($\beta_{\text{Wave 1 to Wave 2}} = 0.058$, $\beta_{\text{Wave 2 to Wave 3}} = 0.082$). Similarly, a stable bidirectional relationship is found between parental monitoring and children's prosocial behavior, with the effect of parental monitoring on children's prosocial behavior ($\beta_{\text{Wave 1 to Wave 2}} = 0.089$, $\beta_{\text{Wave 2 to Wave 3}} = 0.110$) being more pronounced than the reverse effect ($\beta_{\text{Wave 1 to Wave 2}} = 0.051$, $\beta_{\text{Wave 2 to Wave 3}} = 0.047$). Furthermore, school engagement consistently predicted children's prosocial behavior from Wave 1 to Wave 2 and from Wave 2 to Wave 3, while children's prosocial behavior only predicted school engagement from Wave 1 to Wave 2. Hypothesis 1a and 1b were supported.

Within-Person Prospective Effect

The CLPM illustrates longitudinal predictive relationships among levels of children's school engagement, parental monitoring, and prosocial behavior. However, it confounds between-person and within-person effects and thus cannot assess causality. Specifically, it is unclear whether changes in one factor would bring subsequent changes in other factors at the within-person level. This is a question particularly meaningful for designing intervention programs. RI-CLPM can examine the within-person effect. Figure 2 shows the RI-CLPM results. This model fits the data well, CFI = 0.998, SRMR = 0.010, RMSEA (90%CI) = 0.009 (0.000, 0.015). At the between-person level, the random intercepts of school engagement, parental monitoring, and prosocial behavior are significantly associated with each other, which are consistent with the findings from the CLPM. At the within-person level, increasing school engagement consistently predicted future increase in parental monitoring and children's prosocial behavior, supporting Hypotheses 2a. In addition, increases in children's school engagement at Wave 1 significantly predicted increases in parental monitoring at Wave 2, which in turn significantly predicted increases in children's prosocial behavior at Wave 3; and this indirect effect was statistically significant, ab = 0.009, $p = 0.017$, 95% CI = 0.002–0.015, which supported Hypotheses 2b.
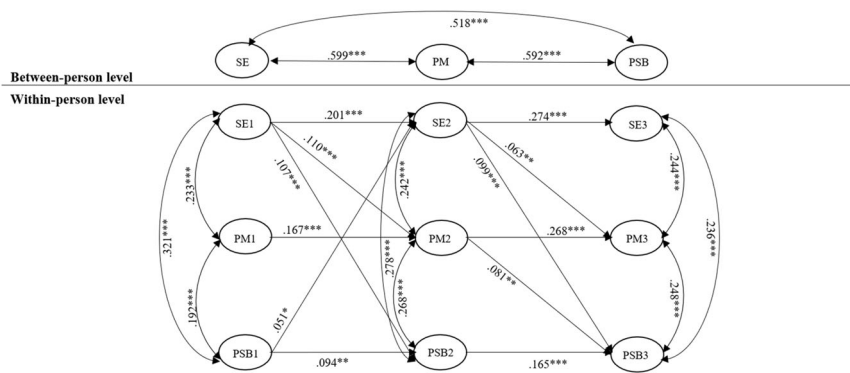
Fig. 2 The random intercept cross-lagged panel model for school engagement, parental monitoring, and child prosocial behavior after controlling for the child age, gender, race, and annual household income. SE Child School Engagement, PM Perceived Parental Monitoring, PSB Child Prosocial Behavior. 1, Wave l; 2, Wave 2; 3, Wave 3. All parameters are standardized. Non-significant paths, error terms, intercepts, and covariance terms are not presented for concision. Significant covariates include age on the intercept of parental monitoring ($\beta = -0.054$, $p = 0.027$); annual household income on the intercept of school engagement ($\beta = -0.075$, $p = 0.008$) and parental monitoring ($\beta = -0.102$, $p < 0.001$). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Fig. 3 Parallel-process latent growth model for child school engagement, parental monitoring, and child prosocial behavior after controlling for gender. SE Child School Engagement, PM Perceived Parental Monitoring, PSB Child Prosocial Behavior. 1, Wave l; 2, Wave2; 3, Wave 3. For concision, only significant paths are shown. All parameters of the report are standardized.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$
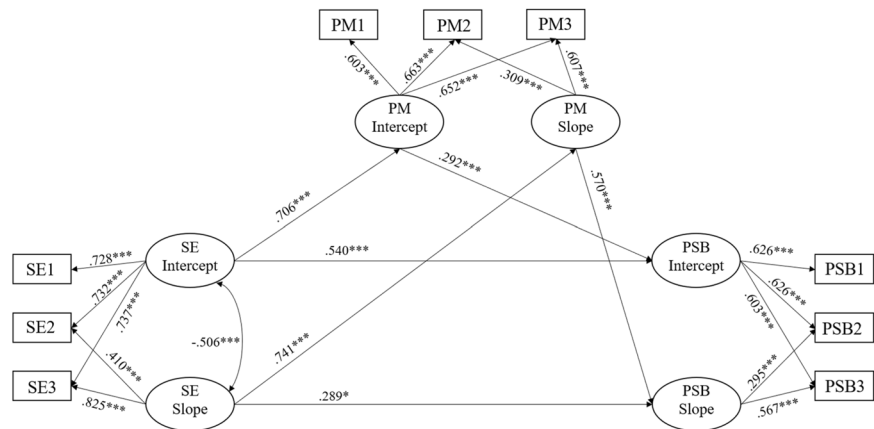
Long-term Developmental Trend

To further examine the relationships among the long-term trends in child school engagement, parental monitoring, and child prosocial behavior, a parallel process latent growth model was conducted. The directions of the relationships in PP-LGM were set up as indicated by the previous RI-CLPM model. The model fits the data well, CFI = 0.903, SRMR = 0.037, RMSEA (90%CI) = 0.072 (0.067, 0.076). Figure 3 shows the PP-LGM results. Child school engagement exhibited a long-term decreasing trend, with a latent intercept = 7.940, $p < 0.001$, and a latent slope = −0.549, $p < 0.001$. Children's prosocial behavior also exhibited a trend of decline, with a latent intercept = 7.423, $p < 0.001$, and a latent slope = −0.093, $p = 0.002$. Parental monitoring did not show an increasing or decreasing trend, with a latent intercept = 13.717, $p < 0.001$, and a latent slope = −0.003, $p = 0.921$. Two sets of mediating pathways were examined for these latent variables. First, for the relations among the initial levels of the three variables, the intercept of school

engagement was positively associated with the intercept of parental monitoring, which was further associated with that of children's prosocial behavior. This suggests that children with higher initial levels of school engagement also had higher initial levels of parental monitoring, which also correlated with higher initial levels of prosocial behavior. The indirect effect of child school engagement on their prosocial behavior via parental monitoring was significant, $ab = 0.206$, $p < 0.001$, 95% CI = [0.137, 0.276]. Second and more importantly, considering the associations among the longitudinal changes of the three variables, the slope of school engagement was associated with the slope of parental monitoring, which in turn was associated with that of children's prosocial behavior. This longitudinal mediating mechanism was significant, with a large effect size, $ab = 0.423$, $p < 0.001$, 95% CI = [0.197, 0.648]. Supporting Hypothesis 3 and Hypothesis 3b, these results suggest that the dynamic child-parent synergistic mechanism identified by the RI-CLPM model also holds for the long-term stable relations among the three variables.

Discussion

Although numerous contextual factors have been identified to influence prosocial behavior, the influence of child-initiated factors on such behavior and its underlying mechanism remain unclear. This study examines a child-parent synergistic mechanism involving child school engagement, parental monitoring, and child prosocial behavior through three longitudinal models. The CLPM results revealed mutually predictive relationships among all three variables, with school engagement having a larger effect size than its reciprocal effects. The RI-CLPM found that a higher than usual level of child school engagement consistently predicted more positive deviations in parental monitoring and prosocial behavior. The parallel-process latent growth model indicated that on average school engagement and prosocial behavior decrease over time, while parental monitoring remains relatively stable. In terms of individual differences, higher initial levels and change rate of school engagement were associated with higher initial levels and change rate of parental monitoring and school engagement. Overall, three models converged on a consistent conclusion that child school engagement promotes child prosocial behavior, and one underlying mechanism for this effect is that child school engagement triggers an increase in parental monitoring. This effect and its underlying mechanism are consistently observed across dynamic and static models, as well as at both within-person and between-person levels.

Longitudinal Relationship Between Child School Engagement and Prosocial Behavior

The results of both CLPM and RI-CLPM showed that early child school engagement predicted later child prosocial behavior, indicating that school engagement is malleable and can lead to subsequent intra-individual changes in prosocial behavior. These results corroborate and extend findings from previous studies on the effect of child school engagement on child prosocial behavior with longitudinal evidence (e.g., Luengo Kanacri et al., 2017; Venta et al., 2019; Demirci, 2020). It is noteworthy that school engagement consistently predicts later prosocial behavior in the RI-CLPM, but prosocial behavior only predicts later school engagement during an earlier developmental period, i.e., from wave 1 to wave 2. The robust developmental pathway from child school engagement to their prosocial behavior underscores the important role of school engagement as a promotive factor of prosocial behavior. School engagement as a protective factor reflects children's intrinsic motivation and efforts to allocate their time and energy towards seeking and receiving positive education and guidance (Payton et al., 2000; MacFarlane & Woolfson, 2013), while disengaging from disruptive behaviors

(Hirschfield & Gasper, 2011; Fredricks et al., 2004). The normative social schema that children acquire in their daily experiences helps them develop a positive and stable behavior pattern in the long term (Crick & Dodge, 1994; Eisenberg et al., 2015). The current study demonstrates the promotive role of children's school engagement in facilitating their prosocial development during childhood and early adolescence, which may be stronger than the reverse effect.

Mediating Effect of Parental Monitoring

The results of the three longitudinal statistical models consistently indicate that parental monitoring partially explains the aforementioned child-parent synergistic mechanism whereby children's school engagement elicits more parental monitoring, which in turn leads to more prosocial behavior in the children. This finding highlights the importance of parental monitoring as a social facilitator for children's prosocial behavior and also provides evidence for a longitudinal dynamic interplay between the child and their proximal context where children are not merely passive recipients of social influences but rather can shape their proximal context, which in turn impact their own behavior as well. School engagement includes children's active participation in school activities, compliance with school rules, and academic investment (Brass et al., 2022; Fredricks et al., 2004), which reflect children's positive motivation for achieving good performance at school. Good school performance makes it easier for parents to support their children by paying more attention to and investing more energy in their children perhaps with less psychological distress than when children struggle academically, and parents may get to know more about their children's whereabouts and who they hang out with (Pastorelli et al., 2016; Newton et al., 2014). This kind of parental monitoring, in turn, may help the children shape a healthy and positive peer relationship (Maiya et al., 2020) and prevent or correct any antisocial behavior (Bray et al., 2022; Simons-Morton & Chen, 2005), thereby shaping children's prosocial behavior. In sum, longitudinal results consistently demonstrate that parental monitoring is an important social facilitator that promotes children's prosocial development. More importantly, longitudinal findings demonstrated that this social facilitator can be strengthened by children's school engagement, which again emphasizes the central role of children's agency.

Implications

This study holds several theoretical implications for how to promote prosocial behavior. First, children are shown to be active agents of positive change, which extends upon prior

theoretical frameworks that primarily emphasized the preponderant role of contextual factors in shaping children's prosocial behavior (e.g., Bronfenbrenner & Morris, 2007; Lerner et al., 2005; Sheridan et al., 2019; Smith et al., 2020). The current study also uncovers a child-parent synergistic mechanism, where school engagement as a child-initiated factor not only exerts a direct influence but also shapes family dynamics by eliciting increased parental monitoring, which jointly promote the child prosocial development.

This study also carries significant developmental implications. First, given the pivotal role of school engagement in fostering prosocial behavior, teachers and practitioners should implement strategies to stimulate children's school engagement, which can help children achieve long-term well-being. Second, the findings indicate that increasing parental monitoring during early adolescence (11–12 years old) helps promote later prosocial behavior (13–14 years old), which suggests the importance of the early adolescence as a sensitive period for parental influence on child prosocial development.

This study also has significant practical implications for policies and programs. The results on between-person differences demonstrate that children who are more engaged in school elicit more attention from parents, which also means that children who are disengaged from school activities receive less parental monitoring. Lack of parental monitoring can further hinder the children's positive behavioral development. Thus, parents and teachers should be aware of this high-risk group and proactively provide them with more support. And the results on within-person changes suggest that parental monitoring can be an effective intervention target. Policy makers and school administrators can implement policies and programs to promote opportunities for parents to learn about their children's performance in school. And these interventions that promote more monitoring in the parents can interrupt the vicious cycle that children's poor school engagement may bring about. Simultaneously, parents should be encouraged to actively engage in family-school interventions to enhance their awareness and understanding for their children's school performance (e.g., academic and social outcomes). Collectively, these efforts by parents, teachers, policy makers, and school administrators can foster a supportive environment for children, ultimately contributing to their holistic development and well-being.

Limitations and Future Directions

This study has several limitations. First, the data used in this study were all based on self-reports. Future studies should combine self-reports, reports from other informants, and observational methods to continue to test the child-parent synergistic mechanism identified in this study. Second, this study only examined the role of school engagement in promoting children's positive development. Other child-initiated factors (e.g., engagement with family, engagement with church) may also play an important role, which is worth exploring. Third, this study only identified parental monitoring as a mediating contextual factor in the child-parent synergistic mechanism. Future studies should investigate the roles of peers and teachers as well. Finally, while the data used in this study were nationally representative of U.S. children, whether the findings can be generalized to those from the Majority World is an open question. Therefore, future research should examine the validity of the proposed child-parent synergistic mechanism in children and adolescents from other parts of the world and should also explore culture-specific mechanisms leading to child prosocial development.

Conclusion

While contextual factors affect children's prosocial behavior, the role of child-initiated factors and their underlying mechanisms remain unclear. This study established the dynamic relationships and long-term development trends among child school engagement, parental monitoring, and child prosocial behavior. Phenomenologically, they predict each other's future states. Mechanistically, changes in child's school engagement can serve as a driving factor, stimulating subsequent increases in parental monitoring and then prosocial behavior. This child-parent synergistic mechanism also develops into a long-term stable trend. Overall, this study provides initial evidence of the substantial role children play as initiators of their own positive development.

Data availability

The datasets generated and/or analyzed during the current study are available in the ABCD Data repository, https://doi.org/10.15154/8873-zj65.

Compliance with Ethical Standards

Conflict of Interest The authors declare no competing interests.

Ethical Approval The human research protections programs and institutional review boards at universities participating in the ABCD project approved all experimental and consenting procedures. All procedures performed in studies involving human participants were in accordance with the Declaration of Helsinki.

Informed Consent Parental consent and children assent were obtained from all participants included in the study.

References

Arthur, M. W., Briney, J. S., Hawkins, J. D., Abbott, R. D., Brooke-Weiss, B. L., & Catalano, R. F. (2007). Measuring risk and protection in communities using the Communities That Care Youth Survey. *Evaluation and Program Planning*, 30(2), 197–211. https://doi.org/10.1016/j.evalprogplan.2007.01.009.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2), 238–246. https://doi.org/10.1037/0033-2909.107.2.238.

Brass, N. R., Memmott-Elison, M. K., Brockmeier, L., Hung, C., & Bergin, C. (2022). Prosocial behavior and school engagement during adolescence: The mediating role of self-regulation. *Journal of Applied Developmental Psychology*, 83, 101477 https://doi.org/10.1016/j.appdev.2022.101477.

Bray, J. H., Gallegos, M. I., Cain, M. K., & Zaring-Hinkle, B. (2022). Parental monitoring, family conflict, and adolescent alcohol use: A longitudinal latent class analysis. *Journal of Family Psychology*, 36(7), 1154–1160. https://doi.org/10.1037/fam0001019.

Bronfenbrenner, U., & Morris, P. A. (2007). *The bioecological model of human development*. Handbook of child psychology, 1.

Brouwer, J., & Engels, M. C. (2021). The role of prosocial attitudes and academic achievement in peer networks in higher education. *European Journal of Psychology of Education*, 1–18. https://doi.org/10.1007/s10212-020-00526-w.

Caprara, G. V., Barbaranelli, C., Pastorelli, C., Bandura, A., & Zimbardo, P. G. (2000). Prosocial foundations of children's academic achievement. *Psychological Science*, 11, 302–306. https://doi.org/10.1111/1467-9280.00260.

Carlo, G., Crockett, L. J., Wilkinson, J. L., & Beal, S. J. (2011). The longitudinal relationships between rural adolescents' prosocial behaviors and young adult substance use. *Journal of Youth and Adolescence*, 40, 1192–1202. https://doi.org/10.1007/s10964-010-9588-4.

Carlo, G., Knight, G. P., McGinley, M., Zamboanga, B. L., & Jarvis, L. H. (2010). The multidimensionality of prosocial behaviors and evidence of measurement equivalence in Mexican American and European American early adolescents. *Journal of Research on Adolescence*, 20(2), 334–358. https://doi.org/10.1111/j.1532-7795.2010.00637.x.

Chen, F., Curran, P. J., Bollen, K. A., Kirby, J., & Paxton, P. (2008). An empirical evaluation of the use of fixed cutoff points in RMSEA test statistic in structural equation models. *Sociological Methods & Research*, 36(4), 462–494. https://doi.org/10.1177/0049124108314720.

Chernyak, N., & Kushnir, T. (2018). The influence of understanding and having choice on children's prosocial behavior. *Current Opinion in Psychology*, 20, 107–110. https://doi.org/10.1016/j.copsyc.2017.07.043.

Christenson, S., Reschly, A. L., & Wylie, C. (2012). Handbook of research on student engagement (Vol. 840). New York: Springer

Cox, M. J., & Paley, B. (2003). Understanding families as systems. *Current Directions in Psychological Science*, 12(5), 193–196. https://psycnet.apa.org/doi/10.1111/1467-8721.01259.

Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin*, 115(1), 74–101. https://psycnet.apa.org/doi/10.1037/0033-2909.115.1.74.

Davis, A. N., Carlo, G., Streit, C., Schwartz, S. J., Unger, J. B., Baezconde-Garbanati, L., & Szapocznik, J. (2018). Longitudinal associations between maternal involvement, cultural orientations, and prosocial behaviors among recent immigrant Latino adolescents. *Journal of Youth and Adolescence*, 47, 460–472. https://doi.org/10.1007/s10964-017-0792-3.

Demirci, I. (2020). School engagement and well-being in adolescents: Mediating roles of hope and social competence. *Child Indicators Research*, 13(5), 1573–1595. https://link.springer.com/article/10.1007/s12187-020-09722-y.

DiClemente, R. J., Wingood, G. M., Crosby, R., Sionean, C., Cobb, B. K., Harrington, K., & Oh, M. K. (2001). Parental monitoring: Association with adolescents' risk behaviors. *Pediatrics*, 107, 1363–1368. https://doi.org/10.1542/peds.107.6.1363.

Eisenberg, N., Spinrad, T. L., & Knafo-Noam, A. (2015). Prosocial development. In M. E. Lamb & C. Garcia Coll (Vol. Eds.), & R. M. Lerner (Series Ed.), Handbook of child psychology: Vol. 3. Social, emotional, and personality development (7th ed., pp. 610–656), New York, NY: Wiley

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of educational research*, 74(1), 59–109. https://doi.org/10.3102/00346543074001059.

Garbacz, S. A., Zerr, A. A., Dishion, T. J., Seeley, J. R., & Stormshak, E. A. (2018). Parental educational involvement in middle school: Longitudinal influences on student outcomes. *The Journal of Early Adolescence*, 38(5), 629–660. https://doi.org/10.1177/0272431616687670.

Goemans, A., van Geel, M., Wilderjans, T. F., van Ginkel, J. R., & Vedder, P. (2018). Predictors of school engagement in foster children: A longitudinal study. *Children and Youth Services Review*, 88, 33–43. https://doi.org/10.1016/j.childyouth.2018.02.029.

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of child psychology and psychiatry*, 38(5), 581–586. https://doi.org/10.1111/j.1469-7610.1997.tb01545.x.

Graham, J. W. (2009). Missing Data Analysis: Making It Work in the Real World. *Annual Review of Psychology*, 60, 549–576. https://doi.org/10.1146/annurev.psych.58.110405.085530.

Hamaker, E. L., Kuiper, R. M., & Grasman, R. P. (2015). A critique of the cross-lagged panel model. *Psychological Methods*, 20(1), 102–116. https://doi.org/10.1037/a0038889.

Henke, T. M., Stolz, H. E., & Barber, B. K. (2011). Adolescent religiosity and perceptions of parenting: Relationships with adolescent antisocial behavior and prosocial behavior. *Family Science Review*, 16(2), 44–58.

Hepach, R., & Warneken, F. (2018). Editorial overview: Early development of prosocial behavior: Revealing the foundation of human prosociality. *Current Opinion in Psychology*, 20, 4–8. https://doi.org/10.1016/j.copsyc.2018.02.001.

Hirschfield, P. J., & Gasper, J. (2011). The relationship between school engagement and delinquency in late childhood and early adolescence. *Journal of Youth and Adolescence*, 40, 3–22. https://doi.org/10.1007/s10964-010-9579-5.

Hornby, G., & Lafaele, R. (2011). Barriers to parental involvement in education: An explanatory model. *Educational Review*, 63(1), 37–52. https://doi.org/10.1080/00131911.2010.488049.

House, B. R. (2018). How do social norms influence prosocial development? *Current Opinion in Psychology*, 20, 87–91. https://doi.org/10.1016/j.copsyc.2017.08.011.

Hu, L.-t, & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. https://doi.org/10.1080/10705519909540118.

Karoly, H. C., Callahan, T., Schmiege, S. J., & Feldstein Ewing, S. W. (2016). Evaluating the Hispanic paradox in the context of adolescent risky sexual behavior: The role of parent monitoring. *Journal of Pediatric Psychology*, 41(4), 429–440. https://doi.org/10.1093/jpepsy/jsv039.

Knafo, A., & Plomin, R. (2006). Prosocial behavior from early to middle childhood: genetic and environmental influences on stability and change. *Developmental Psychology*, 42(5), 771–786. https://doi.org/10.1037/0012-1649.42.5.771.

Krishnakumar, A., Narine, L., Roopnarine, J. L., & Logie, C. (2014). Multilevel and cross-level effects of neighborhood and family influences on children's behavioral outcomes in Trinidad and Tobago: The intervening role of parental control. *Journal of Abnormal Child Psychology*, 42, 1057–1068. https://doi.org/10.1007/s10802-014-9852-2.

Lerner, R. M., Lerner, J. V., Almerigi, J., Theokas, C., Phelps, E., & Gestsdóttir, S., et al. (2005). Positive youth development, participation in community youth development programs, and community contributions of fifth-grade adolescents: Findings from the first wave of the 4-H Study of Positive Youth Development. *Journal of Early Adolescence*, 25(1), 17–71. https://doi.org/10.1177/0272431604272461.

Little, R. J., & Rubin, D. B. (2002). Maximum likelihood for general patterns of missing data: Introduction and theory with ignorable nonresponse. *Statistical analysis with missing data*, 164–189. https://doi.org/10.1002/9781119013563.ch8.

Lowe, K., & Dotterer, A. M. (2013). Parental monitoring, parental warmth, and minority youths' academic outcomes: Exploring the integrative model of parenting. *Journal of Youth and Adolescence*, 42, 1413–1425. https://doi.org/10.1007/s10964-013-9934-4.

Luengo Kanacri, B. P., Eisenberg, N., Thartori, E., Pastorelli, C., Uribe Tirado, L. M., Gerbino, M., & Caprara, G. V. (2017). Longitudinal relations among positivity, perceived positive school climate, and prosocial behavior in Colombian adolescents. *Child Development*, 88(4), 1100–1114. https://doi.org/10.1111/cdev.12863.

MacFarlane, K., & Woolfson, L. M. (2013). Teacher attitudes and behavior toward the inclusion of children with social, emotional and behavioral difficulties in mainstream schools: An application of the theory of planned behavior. *Teaching and Teacher Education*, 29, 46–52. https://doi.org/10.1016/j.tate.2012.08.006.

Maiya, S., Carlo, G., Gülseven, Z., & Crockett, L. (2020). Direct and indirect effects of parental involvement, deviant peer affiliation, and school connectedness on prosocial behaviors in US Latino/a youth. *Journal of Social and Personal Relationships*, 37(10-11), 2898–2917. https://doi.org/10.1177/0265407520941611.

Marengo, D., Jungert, T., Iotti, N. O., Settanni, M., Thornberg, R., & Longobardi, C. (2018). Conflictual student–teacher relationship, emotional and behavioral problems, prosocial behavior, and their associations with bullies, victims, and bullies/victims. *Educational Psychology*, 38(9), 1201–1217. https://doi.org/10.1080/01443410.2018.1481199.

Muthén, B., & Muthén, L. (2019). *Mplus: A General Latent Variable Modeling Program (Version 8.3)*. Los Angeles, CA: Muthén & Muthén.

Newton, E. K., Laible, D., Carlo, G., Steele, J. S., & McGinley, M. (2014). Do sensitive parents foster kind children, or vice versa? Bidirectional influences between children's prosocial behavior and parental sensitivity. *Developmental Psychology*, 50(6), 1808–1816. https://psycnet.apa.org/doi/10.1037/a0036495.

Nie, Q., Teng, Z., Yang, C., Griffiths, M. D., & Guo, C. (2024). Longitudinal Relationships Between School Climate, Academic Achievement, and Gaming Disorder Symptoms Among Chinese Adolescents. *Journal of Youth and Adolescence*, 53(7), 1646–1665. https://doi.org/10.1007/s10964-024-01952-5.

Olivier, E., Morin, A. J., Langlois, J., Tardif-Grenier, K., & Archambault, I. (2020). Internalizing and externalizing behavior problems and student engagement in elementary and secondary school students. *Journal of Youth and Adolescence*, 49, 2327–2346. https://doi.org/10.1007/s10964-020-01295-x.

Orth, U., Clark, D. A., Donnellan, M. B., & Robins, R. W. (2021). Testing prospective effects in longitudinal research: Comparing seven competing cross-lagged models. *Journal of Personality and Social Psychology*, 120(4), 1013–1034. https://doi.org/10.1037/pspp0000358.

Pastorelli, C., Lansford, J. E., Luengo Kanacri, B. P., Malone, P. S., Di Giunta, L., Bacchini, D., & Sorbring, E. (2016). Positive parenting and children's prosocial behavior in eight countries. *Journal of Child Psychology and Psychiatry*, 57(7), 824–834. https://doi.org/10.1111/jcpp.12477.

Paulus, M. (2018). The multidimensional nature of early prosocial behavior: a motivational perspective. *Current Opinion in Psychology*, 20, 111–116. https://doi.org/10.1016/j.copsyc.2017.09.003.

Payton, J. W., Wardlaw, D. M., Graczyk, P. A., Bloodworth, M. R., Tompsett, C. J., & Weissberg, R. P. (2000). Social and emotional learning: A framework for promoting mental health and reducing risk behavior in children and youth. *Journal of School Health*, 70(5), 179–185. https://doi.org/10.1111/j.1746-1561.2000.tb06468.x.

Penner, L. A., Dovidio, J. F., Piliavin, J. A., & Schroeder, D. A. (2005). Prosocial Behavior: Multilevel Perspectives. *Annual Review of Psychology*, 56(1), 365–392. https://doi.org/10.1146/annurev.psych.56.091103.070141.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879.

R Core Team (2023). R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria

Sheridan, S. M., Smith, T. E., Moorman Kim, E., Beretvas, S. N., & Park, S. (2019). A meta-analysis of family-school interventions and children's social-emotional functioning: Moderators and components of efficacy. *Review of Educational Research*, 89(2), 296–332. https://doi.org/10.3102/0034654318825437.

Shillington, A. M., Lehman, S., Clapp, J., Hovell, M. F., Sipan, C., & Blumberg, E. J. (2005). Parental monitoring: Can it continue to be protective among high-risk adolescents? *Journal of Child & Adolescent Substance Abuse*, *15*(1), 1–15. https://doi.org/10.1300/J029v15n01_01.

Simons-Morton, B., & Chen, R. (2005). Latent growth curve analyses of parent influences on drinking progression among early adolescents. *Journal of Studies on Alcohol*, *66*(1), 5–13. https://doi.org/10.15288/jsa.2005.66.5.

Skinner, E. A., Kindermann, T. A., & Furrer, C. (2009). A motivational perspective on engagement and disaffection: Conceptualization and assessment of children's behavioral and emotional participation in academic activities in the classroom. *Educational and Psychological Measurement*, *69*, 493–525. https://doi.org/10.1177/0013164408323233.

Smith, T. E., Sheridan, S. M., Kim, E. M., Park, S., & Beretvas, S. N. (2020). The effects of family-school partnership interventions on academic and social-emotional functioning: A meta-analysis exploring what works for whom. *Educational Psychology Review*, *32*, 511–544. https://doi.org/10.1007/s10648-019-09509-w.

Stattin, H., & Kerr, M. (2000). Parental monitoring: A reinterpretation. *Child Development*, *71*(4), 1072–1085. https://doi.org/10.1111/1467-8624.00210.

Van der Graaff, J., Carlo, G., Crocetti, E., Koot, H. M., & Branje, S. (2018). Prosocial behavior in adolescence: Gender differences in development and links with empathy. *Journal of Youth and Adolescence*, *47*(5), 1086–1099. https://doi.org/10.1007/s10964-017-0786-1.

van Kleef, G. A., & Lelieveld, G. J. (2022). Moving the self and others to do good: the emotional underpinnings of prosocial behavior. *Current Opinion in Psychology*, *44*, 80–88. https://doi.org/10.1016/j.copsyc.2021.08.029.

Varma, M. M., Chen, D., Lin, X., Aknin, L. B., & Hu, X. (2023). Prosocial behavior promotes positive emotion during the COVID-19 pandemic. *Emotion*, *23*(2), 538–553. https://doi.org/10.1037/emo0001077.

Vaughan, E. P., Speck, J. S., Frick, P. J., Robertson, E. L., Ray, J. V., Thornton, L. C., & Cauffman, E. (2022). Longitudinal associations of parental monitoring and delinquent peer affiliation: The potential influence of parental solicitation and monitoring rules. *Journal of Adolescence*, *94*(4), 656–666. https://doi.org/10.1002/jad.12054.

Venta, A., Bailey, C., Muñoz, C., Godinez, E., Colin, Y., Arreola, A., & Lawlace, S. (2019). Contribution of schools to mental health and resilience in recently immigrated youth. *School Psychology*, *34*(2), 138–147. https://doi.org/10.1037/spq0000271.

Véronneau, M. H., & Dishion, T. J. (2010). Predicting change in early adolescent problem behavior in the middle school years: A mesosystemic perspective on parenting and peer experiences. *Journal of Abnormal Child Psychology*, *38*, 1125–1137. https://doi.org/10.1007/s10802-010-9431-0.

Wang, M. T., & Fredricks, J. A. (2014). The reciprocal links between school engagement, youth problem behaviors, and school dropout during adolescence. *Child development*, *85*(2), 722–737. https://doi.org/10.1111/cdev.12138.

Wentzel, K. R., Barry, C. M., & Caldwell, K. A. (2004). Friendships in Middle School: Influences on Motivation and School Adjustment. *Journal of Educational Psychology*, *96*(2), 195–203. https://psycnet.apa.org/doi/10.1037/0022-0663.96.2.195.

Yoo, H., Feng, X., & Day, R. D. (2013). Adolescents' empathy and prosocial behavior in the family context: A longitudinal study. *Journal of Youth and Adolescence*, *42*, 1858–1872. https://doi.org/10.1007/s10964-012-9900-6.

Yoo, J. A. (2017). Developmental changes in the bidirectional relationships between parental monitoring and child delinquency. *Children and Youth Services Review*, *73*, 360–367. https://doi.org/10.1016/j.childyouth.2017.01.008.

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