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Positive parenting and adolescent prosocial behaviour – a mediation analysis with representative data

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ABSTRACT

Understanding factors promoting adolescent prosocial behaviour is crucial for positive development. This study explores how positive parenting relates to prosocial behaviour. Utilizing data from a nationally representative sample of 5,317 Finnish adolescents (mean age 15.2, 51.3% girls), we examined the mediating roles of self-control, identification with family and friends, and the moderating effects of gender and antisocial peers. The results revealed that both parental warmth and monitoring were positively associated with prosocial behaviour. Self-control, identification with family and friends, and gender significantly influenced this relationship. Boys appeared more receptive to the positive influence of parenting, while the presence of antisocial peers weakened the link between parental warmth and prosociality. Furthermore, identification with family and friends strengthened the positive effects of parenting on prosocial behaviour. These findings underscore the complex interplay of individual and social factors, highlighting their roles in shaping adolescent prosocial development.

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Adolescence; prosocial behaviour; parental warmth; self-control; mediation model

Introduction

Understanding how to improve adolescent well-being and positive development is a pressing concern. Strengthening prosocial behaviour in young people may be one way to achieve this, promoting both favourable development, healthy lifestyles, societal harmony and teamwork (Carlo & Padilla-Walker, 2020). Prosocial behaviour refers to voluntary actions intended to benefit others, including kindness, helping, comforting, sharing, donating, altruism, and cooperating, and it forms the basis of adolescents' moral development, social well-being, trustworthiness, and positive interpersonal relationships with significant others, and is highly valued around the world (Eisenberg et al., 2013). Further, prosocial behaviours associate with less frequent antisocial acts and lower aggression (Carlo & Padilla-Walker, 2020; Memmott-Elison et al., 2020), better academic achievements (Carlo et al., 2018), more empathy (Yang et al., 2023), good peer relations, and subjective well-being (J. Li et al., 2021) among adolescents. In a recent meta-analysis, prosocial behaviours, values, and peers were significant protective factors for antisocial behaviour in youth (Gubbels et al., 2024).

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Prosocial behavior, parenting and self-control

Prosocial behaviours seem to be promoted by some aspects of parenting, such as warmth, connection, responsiveness, and caring, and supportive parents provide a caring model for adolescents and their maturing prosociality (Carlo & Padilla-Walker, 2020; Carlo et al., 2018). Longitudinal research by Lee et al. (2017) found a positive association between parental warmth and adolescent prosocial behaviour. This effect, however, was largely indirect, mediated by self-regulation and prosocial peer association. Adolescent prosocial behaviour has also been linked to parental monitoring (Silke et al., 2018; Yoo et al., 2013), which is generally understood as parental knowledge of children's whereabouts, activities, and peer relationships, and parental desires to be aware of these aspects of their children's lives (Stattin & Kerr, 2000). A systematic review found that parental monitoring associates with adolescent prosocial responding, and parents may, for example, supervise their children through active monitoring of social media use or by making an effort to know about their activities (Silke et al., 2018). Parental warmth and parental monitoring both have effects on adolescent development and well-being, a view that is widely shared among both researchers and practitioners (Carlo et al., 2018; Steinberg & Silk, 2002). Together parental warmth and monitoring form a positive parenting style, which relates to prosocial behaviours in infancy, childhood, and adolescence (Wong et al., 2021).

In addition to prosocial behaviours, positive parenting style has an impact on the development of adolescent self-control (J. B. Li et al., 2019), which in turn links positively to prosocial behaviour (Eisenberg et al., 2013; Lee et al., 2017; Padilla-Walker & Christensen, 2011). This developmental pathway suggests that self-control acts as an intermediate process through which parenting affects subsequent behaviours, including prosocial behaviour. Self-control can be defined as the ability to modify dominant responses to abide by social and moral norms and to support the achievement of long-term goals (Tangney et al., 2018). Relative to adolescents with low levels of self-control, those with higher levels have fewer emotional and behavioural disturbances, use less drugs and alcohol, and have better academic skills (J. B. Li et al., 2019; Tangney et al., 2018). Importantly, good self-control enables prosocial behaviour, and prosocial skills help adolescents to use self-control properly (Nie et al., 2016; Padilla-Walker & Christensen, 2011). By providing clear standards for behaviour, a positive parenting style promotes youth to develop self-control by solving problems themselves and understanding the rules, norms, and expectations of appropriate behaviours (Álvarez-García et al., 2019; J. B. Li et al., 2019). Good self-regulation skills may be fostered by a combination of high levels of parental responsiveness and demandingness, and by modelling caring and responsive behaviours (Carlo et al., 2018; Padilla-Walker & Christensen, 2011).

Social relationships and prosociality

The social world begins to extend beyond the family in adolescence, with peers becoming increasingly important. Previous studies suggest that both parents and peers play crucial roles in adolescent outcomes, but some evidence highlights the greater significance of peers during adolescence (Brown & Bakken, 2011). However, parents and peers are not competing sources of influence; rather, both contribute to adolescents' well-being (Brown & Bakken, 2011; Lee et al., 2017). Identification with family and friends refers to psychological processes through which individuals see themselves as connected to, and derive a sense of belonging and self-identity from, their family and friends, respectively (Liable & Carlo, 2004). This identification involves adopting and sharing similar values, interests, behaviours, and a sense of unity and loyalty. Identification with a social group, such as family or friends, means feeling socially integrated and committed to others (Albarello et al., 2018; Crocetti et al., 2023). It can lead to feelings of closeness and a desire to share problems (Palmonari et al., 1991). Social identification positively affects adolescents' adjustment and intergroup relationships (Albarello et al., 2018). Adolescents who identify more with their peers cope better with developmental tasks and have more positive attitudes towards other peer groups (Palmonari et al., 1991). The degree of social identification

varies among young people. High identification with a group encourages social integration, contribution, acceptance, and coherence, motivating prosocial behaviour (Hackel et al., 2017). Those with better mental health and coping skills tend to identify with multiple social groups (Benish-Weisman et al., 2015; Miller et al., 2015), and identification with classmates is linked to long-term social well-being (Albarello et al., 2021). Identification with family often has a stronger effect than identification with friends, possibly due to the transient nature of friendships (Miller et al., 2015). Optimal outcomes occur when adolescents identify with both peers and family. Identifying only with friends can lead to family distancing and social marginalization, while identifying only with family can hinder identity development and independence (Palmonari et al., 1991). Parents play a crucial role in socializing adolescents, fostering social interactions with friends, and strengthening social identification (Brown & Bakken, 2011).

Peer influence on prosocial behavior

Adolescents who are connected to supportive peers engage in prosocial behaviour more often (Lee et al., 2017; Van Hoorn et al., 2016), and prosocial behaviours tend to protect youth from affiliating with antisocial friends (Carlo et al., 2014). For example, in the study of Lee et al. (2017), prosocial peers promoted prosocial behaviour but were not related to deviant behaviours. However, antisocial peers may have negative effects on adolescents' behaviours (Backman et al., 2018; Van Hoorn et al., 2016), and deviant peers associate negatively with self-regulation (Brown & Bakken, 2011; Lee et al., 2017). Carlo et al. (2014) found that deviant peer association may diminish adolescents' prosocial behaviour, but not all its forms, such as altruism. Along with prosocial behaviour, adolescents' friendships may relate to parenting since parents can influence peer association directly or indirectly. Parental decisions of neighbourhood, school and activities, their values and attitudes may shape adolescents' behaviour and peer groups they join (Brown & Bakken, 2011). On the other hand, antisocial peers may moderate the influence of parenting on adolescent behaviour, at least amplify the influence of negative parenting on behavioural problems (Lansford et al., 2003). Further, parental affection, communication, and control protect youth from antisocial behaviours indirectly through less antisocial friendships, less impulsivity, and more empathy (Álvarez-García et al., 2019). However, we still know little about the impact of antisocial peers on the prosocial behaviour of adolescents who receive parental warmth.

Effects of parenting styles on adolescent behaviour may be different for boys and girls. Some findings indicate no differences across genders in parenting and child prosocial behaviour (Wong et al., 2021), although, in general, girls seem to exhibit more emotional and altruistic prosocial behaviours than boys according to several studies (Carlo & Padilla-Walker, 2020; Van der Graaff et al., 2018). For example, in the study of Nie et al. (2016), secure maternal attachment was associated with more prosocial behaviours in adolescent girls. Further, other demographic variables, such as family income and ethnicity, have been taken into account in previous studies on parenting and prosocial behaviour (Carlo & Padilla-Walker, 2020; Wong et al., 2021; Yoo et al., 2013).

In sum, the available knowledge supports the view that adolescence is a stage that creates opportunities for healthy prosocial development and social adjustment, and this should be supported as much as possible. Also, the COVID-19 pandemic seems to have weakened prosocial attributes and empathic concern of young people in general (Yang et al., 2023). According to the researchers, reasons for it might be reductions in social contact with others, limited physical and emotional interactions, excessive parental discipline, and lack of emotional expressions in real live contacts. Increasing prosocial behaviour of young people is not only justified by the development of empathy, but also due to long-term effects of young people caused by COVID-19. Also, stress and fatigue following the pandemic may be reduced with significant resilience factors, such as kindness, social connectedness, and prosocial acts (Crone & Achterberg, 2022). Given the developmental importance of prosocial behaviours in adolescence, it is important to study the factors that influence their growth and development in young people. Regarding contextual factors, family and friends influence and socialize adolescents the most.

Present study

Based on literature mentioned above, we know that a) positive parenting (i.e. parental warmth and parental monitoring) affect adolescent prosocial behaviour (e.g. Carlo & Padilla-Walker, 2020; Silke et al., 2018), b) good self-control associates with parental warmth and adolescent prosocial behaviour (e.g. J. B. Li et al., 2019), c) identification with social groups links positively to social integration, connectedness, commitment and closeness to others, which foster prosocial behaviour and may be promoted by positive parenting (e.g. Crocetti et al., 2023), d) parents can act as important socializing agents for young people, which can facilitate social interaction with friends and strengthen social identification (e.g. Palmonari et al., 1991), e) antisocial peers may moderate the effects of parenting on adolescent behaviours and weaken the prosocial activity of young people (e.g. Lee et al., 2017), and f) prosocial behaviour might be different among boys and girls (e.g. Carlo & Padilla-Walker, 2020). Integrating parenting, prosocial behaviour, self-control, social identification, and antisocial peers in one study is reasoned. Regardless of robust evidence, some questions remain. For example, whether self-control plays a role in the relationship between positive parenting and prosocial behaviour among Finnish youth, whether antisocial peers moderate the association, and whether identification with friends and family mediate the relationship, remain unknown. Information is also needed about the impact of gender, as the effect of parenting on adolescent well-being may differ between boys and girls.

The chosen theoretical framework for our study aligns with the aim of exploring the connections between parenting and adolescent behaviour, supported by hypotheses grounded in existing literature. While prior research establishes a foundational understanding, it remains unclear which specific factors contribute to this relationship. By focusing on the intermediary and moderating variables within this framework, our selected model enhances our ability to address the research questions effectively and test our hypotheses rigorously. In our study, antisocial peers are hypothesized to amplify or mitigate the effects of parenting styles rather than directly mediate the relationship between parenting and adolescent behaviour. This approach allows us to examine how varying levels of peer influence modify the impact of parenting on adolescent outcomes, aligning with our research aim to understand the moderating role of peer relationships in this context. In contrast, self-control consistently explains how parental factors translate into adolescent behaviours and is thus handled as a mediator. As self-control involves the ability to regulate one's thoughts, emotions, and behaviours in accordance with social and moral norms (Tangney et al., 2018), it directly facilitates prosocial behaviour by enabling adolescents to override immediate impulses and adhere to social expectations. This aligns with the concept of mediation where an intermediate process explains the relationship between parental influences and prosocial outcomes. Also, identification with family and friends is a process through which parenting practices influence adolescent outcomes. Positive parenting styles, such as warmth and monitoring, foster a strong sense of identification with family, which in turn enhances adolescents' identification with friends and social groups. This sequential pathway aligns with the role of a mediator, where identification serves as an intermediary mechanism. In sum, more evidence of these associations with a large and representative data set is warranted. Figure 1 portrays the conceptual model tested in the present study.

The aim of this study was to investigate the links between parenting and prosocial behaviour among a Finnish population-based sample of adolescents. The hypotheses were created based on the current literature. We hypothesized that:

(H1) parental warmth has positive links to adolescents' prosocial behaviour,
(H2) parental monitoring associates positively with adolescent prosocial behaviour,
(H3) the links between positive parenting and adolescent prosocial behaviour are mediated by self-control, and identification with family and peers, so that they all have positive links to prosocial behaviour,

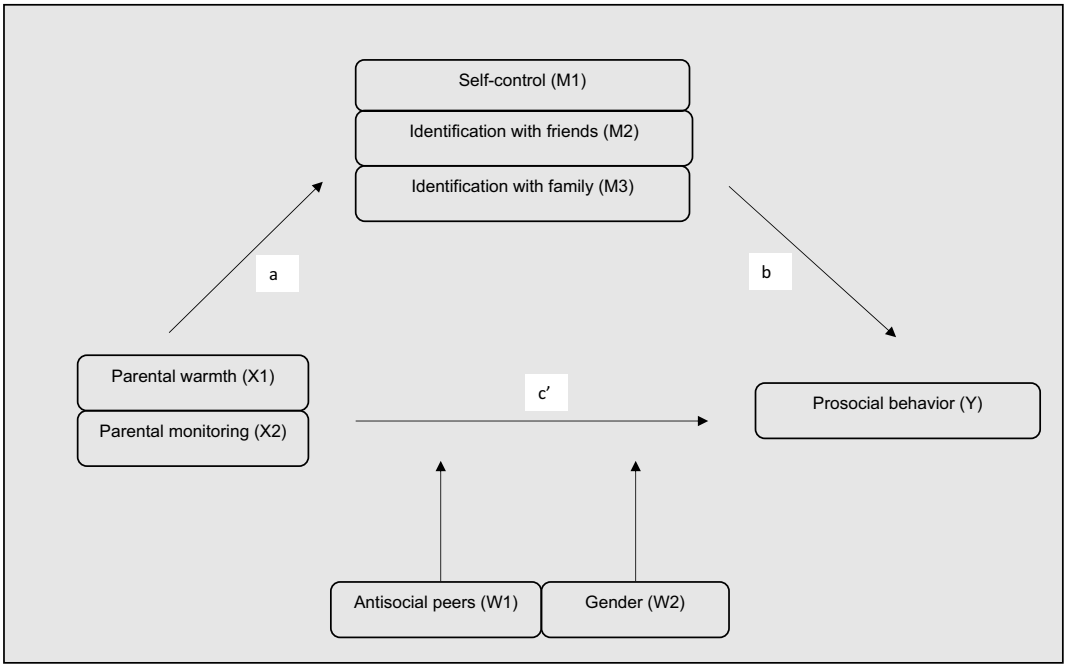

Figure 1. The conceptual model of the present study.
a = X predicting M b = M predicting Y controlling for X a*b = indirect effect c' = direct effect: X predicting Y controlling for M and W

(H4) antisocial peers moderate the relationship between positive parenting and prosocial behaviour, weakening the association, and
(H5) gender has an interaction effect with parental warmth and parental monitoring, moderating the associations with prosocial behaviour so that girls exhibit more prosocial behaviour than boys, resulting in girls exhibiting more prosocial behaviour than boys.

Methods

Participants and procedure

Data were drawn from the Finnish Self-Report Delinquency (FSRD) study carried out in 74 municipal comprehensive schools in Finland in 2020. The FSRD study is a series of nationally representative self-report surveys of juvenile delinquency, including a wide variety of criminal behaviour and a set of individual and family-level background variables. The Institute of Criminology and Legal Policy was responsible for implementation of the FSRD study. It was performed in line with the principles of the Declaration of Helsinki and approved by the University of Helsinki Ethical Review Board in Humanities and Social and Behavioral Sciences (statement 33/2019). Details related to the survey procedure and the study sample can be found elsewhere (Kaakinen et al., 2022).

The survey was completed anonymously during a regular class overseen by a trained teacher for 5674 students in the 9th grade. For this study, certain respondents were excluded due to evidently inaccurate responses concerning specific variables of interest or failing to complete the items included in this study, resulting in a sample size of 5607 (number of missing values: 67; 1,2%). Those adolescents who reported their gender as 'other' were also excluded from the analyses. The final sample size was 5317 for all the other variables (number of missing values: 357; 6,3%), except for parental monitoring, resulting in a sample size drop to 3943 adolescents (number of missing values: 1374; 25,8%).

Participation in the study was based on informed consent provided by the adolescents. Prior to seeking consent, adolescents were provided with a privacy notice regarding the information to be handled in the study, along with other information about the study and its purpose. In addition, parents or guardians of the adolescents were informed about the study and given the opportunity to refuse their ward's participation if they wished to do so. Formal ethical approval from parents was not required in accordance with regulations of the Finnish Advisory Board of Research Integrity.

Measures

Prosocial behavior. Adolescents' prosocial actions were evaluated via the Strength and Difficulties Questionnaire, which measures psychological adjustment in children and adolescents (SDQ; Goodman, 2001). The questionnaire consists of five subscales of which prosocial behaviour was used in this study. The subscale of prosocial behaviour is excluded from the total SDQ score of the measure and acts independently from the other subscales that cover emotional problems, conduct problems, hyperactivity problems, and peer problems. The five items of the prosocial scale use a 3-point Likert format with three response options (1 = not true, 2 = somewhat true, 3 = certainly true). The internal consistency was acceptable (Cronbach's alpha = 0.72).

Parental warmth. The parental warmth measure was modified from the Quality of Parental Inventory (Conger et al., 1994), and it assessed adolescents' perceptions of support, confidence, understanding, and influence of their parents. The scale contains five items in total (e.g. 'How much do your parents understand your problems and concern?'), and the answers were rated on a 4-point Likert scale (1 = very much, 4 = not at all). The scale showed a good internal consistency (Cronbach's alpha = 0.89).

Parental monitoring. Adolescents' perceptions of their parents' monitoring behaviours were measured using a modified 11-item scale (Stattin & Kerr, 2000). The measure of parental monitoring used in the FSRD study included six items about parental monitoring (e.g. 'Do you need permission from your parents to go out on weeknights?') and five items about parental knowledge (e.g. 'Do you spontaneously tell your parents about friends with whom you hang out and how your friends think and feel?'). The items were scored on a 5-point Likert scale (1 = never, 5 = always), and two of the items were designed to be coded reversely. The sum variable showed a good internal consistency (Cronbach's alpha = 0.80).

Self-control. To assess an adolescent's self-control, 12 items were included in the FSRD study based on the Grasmick Self-Control Scale (Grasmick et al., 1993). The self-control scale aims to assess impulsivity, risk-taking behaviour, desire to win, and self-centeredness of the adolescent (e.g. 'I often act on the spur of the moment'). Response categories range from 1 = I disagree to 4 = I agree, with higher scores indicating better self-control after the items were inversely scored. The internal consistency was good (Cronbach's alpha = 0.87).

Antisocial peer association. The variable of antisocial peers was a sum of seven items in which the adolescent was asked to assess a number of friends who act antisocially or illegally (e.g. 'Do you know whether one of your friends has stolen from a store/had a fight in a public place/intimidated, bullied, or disturbed somebody on social media?'). The responses were given with three options (1 = none, 2 = one of my friends, 3 = many of my friends), thus higher scores indicating more antisocial peers. The measure is modified from the study of Thornberry et al. (1994), who used a detailed survey instrument to assess the number of antisocial peers among adolescents as part of their longitudinal study on delinquent behaviour and peer influence.

Identification with friends and family. Through the questions 'How strongly do you identify yourself with friends?' and 'How strongly do you identify yourself with family?', the adolescent's subjective experience of the degree of identification with close ones was measured. The responses were given on a continuum of 1 to 10 (1 = not at all, 10 = very strongly). Also, a sum variable of the level of identification with both family and friends was built and divided into three categories indicating weak (1–3), intermediate (4–7), and strong identification (8–10). The intermediate group consisted of

a) adolescents who identified themselves strongly with family and weakly with friends, or strongly with friends and weakly with family, and b) adolescents who identified themselves at an intermediate level with both friends and family. The categorization into weak, intermediate, and strong identification is a common approach to simplifying the analysis and interpretation of continuous variables (Cohen, 1988). In addition, it allows for a clear delineation, facilitating easier interpretation and analysis of the results. Such categorization also aids in distinguishing between varying degrees of identification, which is crucial for achieving the objectives of the study.

Gender. Gender included two categories, girls and boys, because the option 'other' also provided in the FSRD survey was excluded in this study due to the small group size. Girls were identified with number 0 and boys with number 1.

Control variables. Country of birth (Finland or other), family income, and living conditions were adjusted in the analyses. Family income was assessed via the adolescent's estimate of his/her family's financial situation relative to other families (1 = a lot worse, 4 = same as families I know, 7 = a lot better). Living conditions were added to the analyses to control for the frequency of contact with parents. It was originally measured in the FSRD study by nine categories for whom the adolescent lived with, but in this study, the categories were combined into four groups for clarity (1 = with mother and father continually or alternately, 2 = with mother, 3 = with father, 4 = without mother or father).

Statistical analysis

The data were analysed using IBM SPSS Statistics, version 25 (IBM Corp., 2017), and the statistical analyses were divided into five stages. First, descriptive analyses were performed to test the assumptions of the analyses. Specifically, the assumptions of uni- and multivariate outliers, normality, linearity and homoskedasticity of residuals, multicollinearity, and independence of errors were tested for a multiple regression model with variables predicting prosocial behaviour, and they fulfilled the required assumptions unless otherwise stated. T-tests for independent samples were conducted to analyse differences between genders in independent, outcome, and mediating variables. As a result of the statistical comparisons, p-values of 0.05 or less were considered statistically significant. Bivariate correlations were run to determine whether the predictors, mediators, and dependent variables correlate. Second, a series of linear models were performed to test the effects of predictor variables, mediators and moderators on the dependent variable of prosocial behaviour (steps 1–4). Third, the parallel mediation models were tested, however, limitations influenced the selection of models. Due to constraints in statistical tools, specifically the limitations of the PROCESS macro tool (Hayes, 2017), which restricts the inclusion of more than one independent variable in a single model, we opted to construct two separate models. This decision was crucial in maintaining clarity and statistical integrity. Additionally, while self-control was initially considered as a dependent variable, our focus on adolescent prosocial behaviour necessitated its role as a mediator, consistent with the approach taken by Lee et al. (2017). This decision was made to ensure that our study remained focused on examining the central aspects of adolescent behaviour in relation to parenting. Accordingly, parallel mediation models with a moderator were run separately for the independent variables of parental warmth and parental monitoring and separately for the moderators of antisocial peers and gender. The model was assessed with an extension of the PROCESS macro 4.2 (Model 5), with bootstrapped 95% confidence intervals (5000 iterations). When the confidence intervals of the indirect effects did not exceed zero, mediation was determined. In the mediation model, a indicates *X* predicting *M*; *b* indicates *M* predicting *Y* controlling for X; *c′* indicates the direct effect of *X* predicting *Y* controlling for *M* and *W*; and $a * b$ indicates the indirect effect without the direct effect *c′* (Figure 1). In addition, $c = a * b + c'$ is the total effect, i.e. the sum of direct and indirect effect.

Fourth, a Kruskal-Wallis test was conducted to examine whether prosocial behaviour differed between the three groups of identification with family and friends (a one-way ANCOVA would have been the primary method of analysis so that parenting warmth could have been controlled, but not all assumptions were met). Further, pairwise comparisons with Mann-Whitney U tests were

conducted with a Bonferroni correction applied, resulting in a significance level set at $p < 0.017$. Finally, a predictor of parental monitoring was examined through a regression analysis, and an interaction term of gender was added. Regression analyses were run separately for girls and boys to assess the interaction more precisely. In the analyses, major demographic variables were controlled. The main reason for testing separate models for girls and boys was to uncover more detailed gender-specific patterns on parental warmth, parental monitoring, and prosocial behaviour.

Results

Descriptive statistics

Most adolescents (96.4%) were born in Finland. Over four-fifths of the adolescents lived with both their mother and father (81.6%), 14.4% lived with their mother, 2.7% lived with their father, and 1.3% lived with neither their mother nor father. Over a range of 1 to 7, adolescents valued their family income approximately at the same level or slightly higher than other families ($M = 4.43$, $SD = 1.14$).

Table 1 shows the descriptive statistics for dependent, independent, and mediating variables. On average, girls reported behaving more prosocially ($t(5315) = 20.56$, $p < .001$), having better self-control ($t(5313) = 12.29$, $p < .001$), and experiencing more monitoring from their parents ($t(3822) = 17.89$, $p < .001$) than boys. However, boys experienced parental warmth to be at a significantly higher level than girls ($t(5315) = -7.58$, $p < .001$). Antisocial peers were more common among boys than girls ($t(5315) = -7.42$, $p < .001$). Girls identified themselves with friends more often than boys ($t(5315) = 4.35$, $p < .001$), but no gender differences were found in the variable of identification with family ($t(5315) = -1.02$, $p = .113$). Finally, pairwise correlations between dependent and independent factors indicated that prosocial behaviour was significantly and positively associated with all variables, excluding antisocial peers.

Linear models

The results from the series of linear models are presented in Table 2. After adjustment for country of birth, living conditions, family income, and gender, parental warmth and parental monitoring associated significantly with prosocial behaviour (step 1), as the regression coefficients showed a positive linear association between warmth, monitoring, and prosocial behaviour. Boys reported significantly less prosocial behaviour than girls. Self-control (step 2) and identification with family and friends (step 4) associated significantly and positively with prosocial behaviour after controlling

Table 1. Descriptive statistics and Pearson's correlations for predictor and outcome variables (girls $n = 2727$, boys $n = 2590$).

	Variable	*M (SD)*	Range (min-max)	Girls M (SD)	Boys M (SD)	*p* for difference	1	2	3	4	5	6
1	Prosocial behaviour	7.42 (1.92)	0–10	7.93 (1.66)	6.89 (3.39)	<.001	–					
2	Parental warmth	15.69 (3.47)	5–20	15.34 (3.51)	16.06 (3.39)	<.001	0.22**	–				
3	Parental monitoring	36.27 (8.88)	11–55	38.77 (8.12)	33.87 (8.81)	<.001	0.37**	0.35**	–			
4	Self-control	35.51 (6.54)	12–48	36.55 (6.22)	34.39 (6.68)	<.001	0.23**	0.26**	0.34**	–		
5	Antisocial peers	9.84 (3.28)	7–21	9.52 (3.09)	10.18 (3.43)	<.001	−0.06**	−0.19**	−0.26**	−0.39**	–	
6	Identification with friends	8.39 (1.91)	1–10	8.50 (1.83)	8.27 (1.97)	<.001	0.25**	0.28**	0.18**	0.03*	−0.03*	–
7	Identification with family	8.16 (2.19)	1–10	8.13 (2.21)	8.19 (2.18)	0.307	0.24**	0.55**	0.34**	0.16**	−0.16**	0.52**

For parental monitoring $n = 3943$.
**$p < 0.01$.

Table 2. Linear models of parental warmth, parental monitoring, and adolescent prosocial behaviour step by step.

	Step 1 β (95% CI)	η_p^2	Step 2 β (95% CI)	η_p^2	Step 3 β (95% CI)	η_p^2	Step 4 β (95% CI)	η_p^2
Parental warmth	0.09 (0.07–0.11)***	.024	0.12 (0.11–0.13)***	.046	0.14 (0.13–0.15)***	.064	0.09 (0.08–0.11)***	.022
Parental monitoring	0.06 (0.05–0.06)***	.059						
Self-control			0.04 (0.03–0.05)***	.017				
Antisocial peers					0.01 (−0.01–0.03)	.000		
Identification with family							0.07 (0.04–0.09)***	.004
Identification with friends							0.15 (0.13–0.18)***	.020
Control variable								
Country of birth	−0.02 (−0.32–0.29)	.000	0.12 (−0.14–0.37)	.000	0.12 (−0.14–0.38)	.000	0.15 (−0.11–0.40)	.000
Living conditions	0.03 (−0.08–0.13)	.000	−0.01 (−0.09–0.08)	.000	−0.03 (−0.12–0.06)	.000	0.00 (−0.08–0.09)	.000
Family income	0.01 (−0.04–0.06)	.000	0.02 (−0.02–0.06)	.000	0.02 (−0.03–0.06)	.000	−0.01 (−0.05–0.04)	.000
Boys (ref. girls)	−0.86 (−0.98–0.74)***	.048	−1.05 (−1.15–0.95)***	.076	−1.14 (−1.24–1.05)***	.089	−1.08 (−1.18–0.99)***	.084

β = standardized regression coefficient; CI = confidence interval, ref = reference group; η_p^2 = partial eta-squared, measure of effect size.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

for the country of birth, living conditions, family income, and gender. However, antisocial peers (step 3) did not have a main effect on prosocial behaviour. Notably, the control variables were non-significant in all analyses. The effect sizes varied from small to medium. However, effect sizes can often be small in large datasets because the large sample size increases statistical power, making it easier to detect small differences or relationships (Khalilzadeh & Tasci, 2017).

Mediation analyses

The results revealed a significant indirect effects (*a*b*) of parental warmth with prosocial behaviour through self-control ($b = 0.02$, 95% CI [0.02–0.03]), identification with friends ($b = 0.02$, 95% CI [0.02–0.03]) and identification with family ($b = 0.02$, 95% CI [0.01–0.03]). The results showed a significantly positive moderating role of gender in the linkage between parental warmth and prosocial behaviour ($b = 0.06$, $t = 4.19$, $p < .001$, $R2 = .0027$). When the mediators and the moderator were in the model, the direct effect (*c'*) between parental warmth and prosocial behaviour was positive and significant for girls ($b = 0.04$, $t = 3.88$, $p = .001$), and positive and significant for boys ($b = 0.10$, $t = 9.17$, $p < .001$). Additionally, the results showed a significant negative moderating role of antisocial peers on the association between parental warmth and prosocial behaviour ($b = -0.01$, $t = -3.31$, $p < .001$, $R2 = .0018$). This points out that the higher number of antisocial peers, the weaker the impact of parental warmth on prosocial behaviour. Antisocial peers moderated the direct link between parental warmth and prosocial behaviour at both low and high levels, but the effect was stronger in low levels (i.e. low number of antisocial peers).

For the association of parental monitoring and adolescent prosocial behaviour, there was a significant indirect link through self-control ($b = 0.008$, 95% CI [0.005–0.012]), identification with friends ($b = 0.007$, 95% CI [0.005–0.009]) and identification with family ($b = 0.005$, 95% CI [0.001–0.008]). Gender moderated the relationship of parental monitoring and prosocial behaviour positively ($b = 0.04$, $t = 4.19$, $p < .001$, $R2 = .007$), whereas antisocial peers did not have a moderating effect on the relationship ($b = -0.0008$, $t = -0.83$, $p = .408$). The direct association between parental monitoring and prosocial behaviour was positive and significant for girls ($b = 0.03$, $t = 5.85$, $p < .001$), and positive and significant for boys ($b = 0.07$, $t = 14.77$, $p < .001$) when the mediators and the moderator were in the model. The results are presented in Figures 2 and 3.

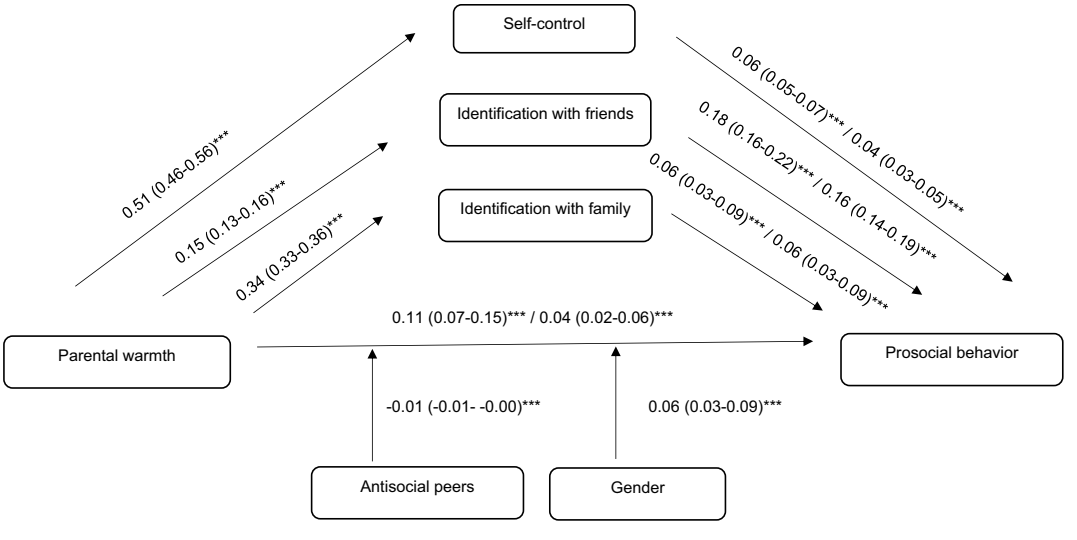

Figure 2. Parallel mediation model of parental warmth on prosocial behaviour with the moderators. Coefficients for antisocial peers on the left side and for gender on the right side of the slash.

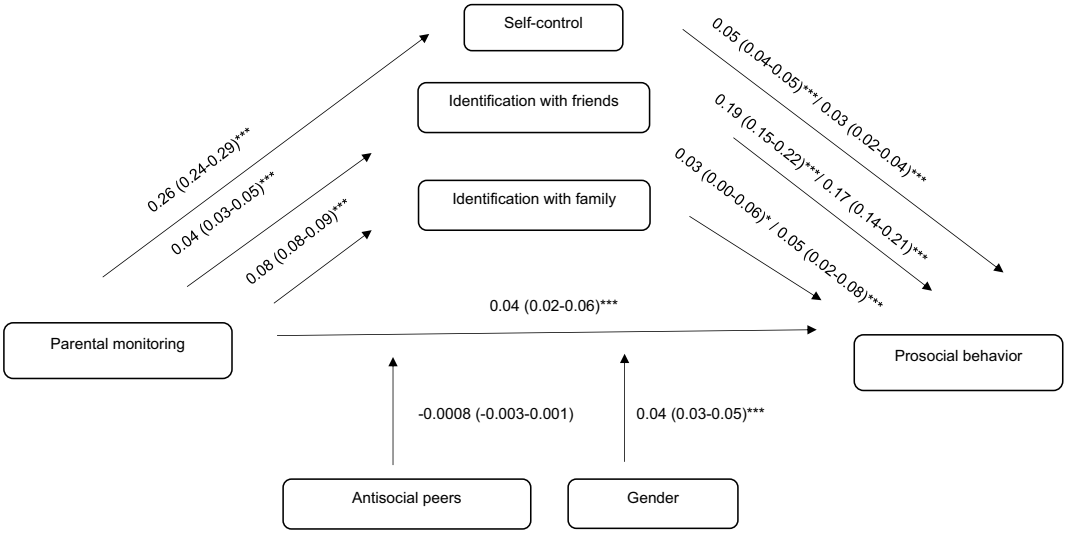

Figure 3. Parallel mediation model of parental monitoring on prosocial behaviour with the moderators. Coefficients for antisocial peers on the left side and for gender on the right side of the slash.

Non-parametric test for independent groups

A non-parametric test to compare outcomes among more than two independent groups (Kruskal-Wallis test) showed that there was a significant difference in prosocial behaviour score between the different levels of identification with family and friends ($\chi 2(2) = 228.50$, $p < .001$), with a mean rank prosocial behaviour score of 1685.41 for weak, 2182.54 for intermediate, and 2861.01 for strong identification. Adolescents who identified themselves strongly with both family and friends scored the highest on the prosocial behaviour scale, and those who identified weakly with both family and friends showed the lowest levels of prosocial behaviour. Furthermore, post hoc comparisons revealed significant differences between all identification groups ($p < .001$ for all pairwise comparisons). We also conducted a one-way ANCOVA, however, all assumptions were not met, and thus, the results should be interpreted with caution. The results are presented in Appendix 2.

Interaction and gender-specific regression analyses

Besides parental warmth, parental monitoring was associated with prosocial behaviour after controlling for country of birth, living conditions, family income, and gender ($b = 0.06$, 95% CI [0.05–0.06], $p < .001$). Both interaction terms (parental warmth * gender and parental monitoring * gender) had a significant effect on prosocial behaviour (for warmth: $b = 0.05$, 95% CI [0.01–0.08], $p < .01$; for monitoring: $b = 0.03$, 95% CI [0.01–0.04], $p < .001$). To examine gender-specific trends in detail and illustrate them visually, following the significant interaction terms identified in the combined model, we conducted separate analyses for girls and boys. Males who experienced parental warmth or parental monitoring as low scored also lowest on the scale of prosocial behaviour. The separate analyses for girls and boys revealed, however, that the slopes of the regression lines appeared visually greater for boys than girls in both parental warmth and parental monitoring. Figure 4 shows raw data (parental warmth/monitoring relation with prosocial behaviour), and notably, the intercepts and coefficients of the regression lines are from the multivariate models. Data points are scattered around the true values for clarity (a value from an interval [−0.4,0.4] has been added to the true value). See Appendix 1 and Table 1 for numerical details.

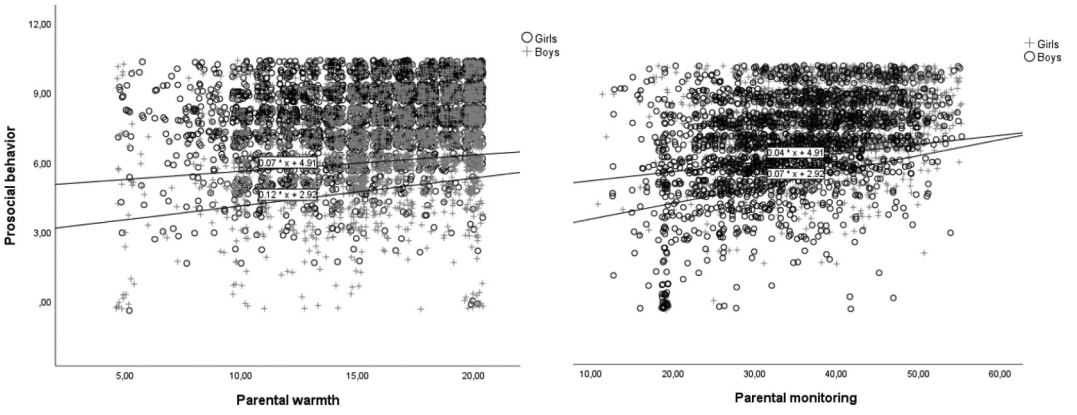

Figure 4. Effects of parental warmth (left) and parental monitoring (right) on prosocial behaviour among girls and boys.

Discussion

Our study with a large population-based sample examined whether parental warmth and monitoring are associated with prosocial behaviour in adolescents. We also explored the mediating roles of self-control and identification with family and friends, and the moderating effects of antisocial peers and gender. Identifying mediators and moderators, this study enhances existing literature by illuminating relationship complexities. This underscores our model's relevance in advancing both theory and practice in this field. The findings aligned with our expectations and previous literature. Firstly, parental behaviours – both warmth (Lee et al., 2017; Wong et al., 2021) and monitoring (Silke et al., 2018; Yoo et al., 2013) – were positively linked to adolescent prosocial behaviour. Secondly, our study confirmed that self-control acts as a mediator between positive parenting and adolescent prosocial behaviour, as seen in previous research (Lee et al., 2017; Padilla-Walker & Christensen, 2011). One explanation for this is that parental monitoring may increase adolescents' problem-solving skills, and awareness of appropriate behaviour, which may help them learn to control their own behaviour (Álvarez-García et al., 2019; J. B. Li et al., 2019). But parental influence goes beyond just setting boundaries. Warm parents model good behaviour, values, and attitude, for example, they may emphasize the importance of focusing on long-term goals rather than immediate gratification, which strengthens self-control (Carlo et al., 2018; Padilla-Walker & Christensen, 2011). In general, homes characterized by warmth, clear expectations (structure), and support for independence (autonomy) – often referred to as authoritative parenting styles – foster positive development in adolescents, and these adolescents tend to be more responsible, confident, adaptable, creative, curious, socially skilled, and academically successful (Carlo et al., 2018; Steinberg & Silk, 2002). These qualities all provide a strong foundation for both self-control and prosocial behaviour. Our findings suggest that parental warmth and monitoring may work together to achieve these positive outcomes. When parents set clear limits and stay informed about their children's activities, it can show the young person that they care (Yoo et al., 2013). Previous research has even shown that parental supervision is most effective in preventing behavioural problems when it occurs alongside parental warmth (Pinquart, 2017). Interestingly, our study also found that parental monitoring has a positive link to prosocial behaviour independently of warmth. Future research could explore whether the combination of parental warmth and monitoring has an even stronger impact on prosocial behaviour than either one alone.

Third, identification with family and identification with friends contributed to higher levels of prosocial behaviour, and they mediated the relationship between positive parenting and prosocial behaviour. The effect was clear for both identification with family and identification with friends, but stronger for identification with friends. This novel finding about the cruciality of

social identification in maximizing the effect of parental warmth and parental monitoring on adolescent prosocial behaviour is the most important finding of this study. Adolescents who identify with either family or peers, or with both, and report getting warmth or monitoring from their parents as well, are more likely to act in a prosocial manner than other adolescents. This highlights the crucial roles of parents and peers in the well-being of adolescents (Brown & Bakken, 2011) and converges with the findings of Yoo et al. (2013) about the potential mediator of child-parent relationship in the links between parental behaviours and adolescent prosocial acts. There is surprisingly little research on social identification, although we know that social groups shape prosocial behaviour, and people often behave more prosocially towards members of their own social groups compared to other groups (Hackel et al., 2017; Van Hoorn et al., 2016). For example, good friendships promote prosocial behaviour (Lee et al., 2017; Van Hoorn et al., 2016) and protect adolescents against deviant behaviour (Backman et al., 2018; Munoz et al., 2008), and parental warmth has many positive outcomes in adolescence (Butterfield et al., 2021). However, our results indicate that the existence of a relationship with family and friends is not necessarily enough if the young person does not identify with them. In other words, it demonstrates that the degree of identification with family and peers is more important during adolescence than family members or friends as such. Social identification may require closeness and desire to reveal one's own problems (Palmonari et al., 1991), feelings of integration, connection, and commitment (Albarello et al., 2018; Crocetti et al., 2023), which may be evoked in a positive home environment. Parents who use a positive parenting style may, for example, model positive interactions at home, prosocial values, and a desire to connect with other people, which in turn facilitate adolescents' prosocial acts and social identification in other environments. Furthermore, this emphasizes the importance of empathy, as it has been found to mediate between parenting and prosocial behaviour (Álvarez-García et al., 2019; Padilla-Walker & Christensen, 2011). Regardless of a positive home environment, on the other hand, difficulties in accepting prosocial values and attitudes with family members may potentially lead to social marginalization, isolation, or a strong identification with peers (Palmonari et al., 1991). In the future, it is important to understand what social identification means to adolescents and how identification with family is related to identification with friends.

Fourth, the results showed that antisocial peers moderated the association between parental warmth and prosocial behaviour indicating that the more antisocial peers the adolescent had, the weaker the impact of parental warmth on prosocial behaviour was. On the other hand, the less antisocial peers, the stronger the relationship between parental warmth and prosocial behaviour. This finding is mostly in line with previous studies (Álvarez-García et al., 2019; Steinberg & Silk, 2002). In our study, the relationship between parental monitoring and prosocial behaviour was not moderated by antisocial peers, although Álvarez-García et al. (2019) reported a protective role of parental control on adolescent antisocial behaviour through the negative relationship with antisocial friendships. However, protection for antisocial behaviour is not the same as prosocial behaviour, which may explain the differences between the results. Our findings differ also from the finding of Lee and colleagues (2017), as in their study, antisocial peer association did not affect the adolescent prosocial behaviour, although it increased antisocial behaviour. Carlo et al. (2014) found that an antisocial peer association may lead to delinquency even in youths with prosocial acts. Further, although social identification links to prosocial behaviour in our study, we do not know whether it links to antisocial behaviour if the identification is directed towards antisocial peers. If a group of peers tends to behave deviantly, high identification with friends combined with a distance from one's family can lead to social marginalization (Palmonari et al., 1991). However, adolescent antisocial behaviour or other negative outcomes were not explored in our study but should be investigated in future research alongside positive outcomes, such as prosocial behaviour. Also, the role of antisocial peers and parenting styles warrant more investigation. It remains unknown, if the identification with antisocial peers reduces prosocial behaviour or increases antisocial acts regardless of parental warmth and if the identification with prosocial friends buffers the risks of parental

hostility and furthermore, if the social identification occurs similarly with prosocial and antisocial peers.

Fifth, gender moderated the relationship between parental behaviours and adolescent prosocial acts. On average, girls with warm and monitoring parents behaved most prosocially, and the adolescents, who behaved in a less prosocial manner and had the least warm and monitoring parents, were typically boys – although boys reported parental warmth more than girls. This result aligns with previous research (Carlo & Padilla-Walker, 2020; Nie et al., 2016; Van der Graaff et al., 2018), which, however, is significantly lacking in terms of gender considerations. The effect of parenting behaviours seemed to be stronger on boys' prosocial behaviour than on girls' behaviour since the difference in prosocial behaviour with low versus high parental warmth was more pronounced among boys. These findings are interesting and partly against expectations. Some studies have not found any differences between parenting and gender-related prosocial behaviour (Wong et al., 2021), and for those that have noted differences, they might be explained by other factors such as cognitive abilities, advanced language, or affection in parent-child interactions (Woodward et al., 2018). Some studies indicate that girls are more likely to receive positive parenting and boys harsh or hostile parenting (Boeldt et al., 2012; McKee et al., 2007; Woodward et al., 2018). Also noteworthy is that the parent's gender may play a role in the relationship between parental warmth and adolescent prosocial behaviour, but we did not examine parent's gender in this study. For example, Padilla-Walker et al. (2012) found that mothers had higher levels of parenting than fathers, and mothers rated the child's prosocial behaviour higher than fathers. In addition, secure maternal attachment is related more strongly to adolescent girls' prosocial acts (Nie et al., 2016). These gender differences in both adolescents and parents remain poorly studied.

Strengths of this study include the wide battery of questions about parenting, with both parental warmth and parental monitoring being explored. Identification with family and friends was considered as a novel point of view in present-day research of adolescent well-being. Also, adolescent self-control was explored, and antisocial peer association and gender were added to the interactions, while the statistical methods applied were sophisticated throughout the study. Finally, the study used a large population-based sample of Finnish adolescents, and the response rate was high. However, a few limitations should be addressed, though. First, the study suffers from restrictions related to self-reports, as there is a risk f shared method variance. Especially, self-report measures of parenting may be vulnerable to this common method bias. Problems with social desirability and single data sources would be prevented if future research had multiple sources of reporting. Especially adolescents' prosocial acts and parental behaviours could be measured via other informants as well. However, in our study there is no evidence of common method bias since the total variance extracted by one factor is 19.96% and it is less than the recommended threshold of 50% according to Harman's single-factor test. Second, the cross-sectional nature of the FSRD study makes it impossible to assess the causality of the associations. It would be fruitful to have a follow-up study in which prosocial behaviour and parenting with the mediators could be measured several times. Third, we assessed only positive outcomes and neglected antisocial acts, problem behaviours, and other negative consequences. Both negative parenting and adolescent negative outcomes, e.g. antisocial behaviour, should be analysed to uncover the relationships of parenting, peers, social identification, and adolescent behaviours. Fourth, identification with family may be a broader construct than identification with parents, as it may differ from identification with siblings and other family members. Fifth, prosocial behaviour was measured quite narrowly and only with self-report. Previous studies have noted that operationalization of prosocial behaviour varies greatly between studies (see Wong et al., 2021). Finally, we did not keep parental warmth or parental monitoring constant in the mediation analyses. It would be reasonable to control parental factors in the following studies, as parental monitoring correlated moderately with both parental warmth and prosocial behaviour. Future studies should define a common comprehensive way to measure adolescent prosocial behaviour via multiple sources. Also, research should investigate the impact of

identification with antisocial friends on prosocial behaviour and use longitudinal data to reveal the causality.

Conclusions

This study showed the crucial roles of parental warmth and monitoring on adolescent prosocial behaviour. The associations were mediated by adolescent self-control and identification with family and friends. These findings add to existing research on the connections between parenting styles, adolescent prosocial behaviour, self-control (Lee et al., 2017; J. B. Li et al., 2019; Nie et al., 2016), identification with close ones (Palmonari et al., 1991), and the influence of antisocial peers (Álvarez-García et al., 2019; Lee et al., 2017; Steinberg & Silk, 2002). Positive parenting practices likely serve as a model for adolescents, teaching them good behaviour, values, and problem-solving skills with a focus on long-term goals. Warmth creates a supportive and positive home environment, fostering a sense of belonging within the family and promoting the development of positive relationships with peers. Parents may also act as social facilitators, encouraging interaction with prosocial friends and strengthening adolescents' identification with those positive influences. Strong and positive connections with both family and friends appear to benefit young people, allowing them to identify with these supportive groups. Given the positive association between self-control and prosocial behaviour in adolescents, and the link between identification with both family and friends and prosocial actions, further research is needed. We should explore ways to enhance adolescents' self-control and strengthen their identification with positive individuals. Supporting the development of good self-control and focusing on the overall positive growth of adolescents are crucial. It is also important to consider gender differences, as boys may be more susceptible to the negative effects of poor parenting on their prosocial behaviour compared to girls. To address this, increasing access to parental counselling programmes that promote positive parenting practices is essential for parents raising children and adolescents.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Compliance with ethical statement

Ethical Approval Statement: Formal ethical approval from parents was not required in accordance with regulations of the Finnish Advisory Board of Research Integrity.

Data availability statement

The data that support the findings of this study are available from the authors but restrictions apply to the availability of these data, which were used under licence from the Institute of Criminology and Legal Policy for the current study, and so are not publicly available. Data are, however, available from the authors upon reasonable request and with permission from the Institute of Criminology and Legal Policy at the University of Helsinki.

Informed consent

Informed consent was obtained from parents.

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