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The bedrock of public service motivation among Chinese adolescents: family and school institutions

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ABSTRACT

This study investigates the individual and interaction effects of parents and teachers on shaping adolescents' PSM. Based on nationally representative data from China, we find that both family- and classroom- level factors positively impact adolescents' PSM. Results further show that a satisfying teacher-student relationship significantly attenuates the influence the parent-child relationship imposes on PSM. This study empirically proves that the development of PSM can be understood as other-oriented emotional responses generated during one's exchanges with socialization agents, leaving fertile ground for inquiries into non-organizational antecedents of PSM and the design of policies to foster it at the pre-entry stage.

Introduction

As a distinct concept developed by public administration scholars, studies of public service motivation (PSM) have grown exponentially and fruitfully over the past 30 years (Awan et al., 2020; Perry & Vandenabeele, 2015; Ritz et al., 2016). Abundant advancements have been made in exploring the relationship between PSM and outcomes, such as job satisfaction (e.g., Andersen & Kjeldsen, 2013), work behaviour (e.g., Hsieh et al., 2012), and organizational commitment (e.g., Taylor, 2008). While PSM performance research is mushrooming, another equally important aspect – its origins – remain poorly understood (Ritz et al., 2016). As Bozeman and Su (2015, p. 705) noted, '*only limited progress has been made in providing an adequate set of explanations or hypotheses about how PSM develops and why some people have more of it than others*'.

Theoretically, PSM is assumed to be cultivated through the socialization process, in which various institutions instil or indoctrinate values to their individual members (Perry, 2000). Given the apparent role of public organizations in shaping public values, most of the scholarly focus has been on identifying organizational correlates, such as work environment, job features, and leadership styles, that affect employee PSM (Harari et al., 2017). However, next to organizational socialization effects, adult workers' PSM may have formed before formally engaging in the workplace, implying substantial differences already at the pre-entry level. Thus, simply investigating organizational

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correlates cannot provide satisfactory explanation about and holistic understanding of the formation and development of PSM. Identifying factors in prework settings will be of immense value in 1) peering into the black box about how PSM evolves and 2) developing intervention strategies to cultivate ones' motivation in the early socialization period.

Families and schools are two essential institutions shaping adolescents' prosocial values, attitudes, and behaviours at the pre-entry level. In earlier research, for instance, parental modelling, attending civic courses, and participating in volunteer activities have proved to be useful approaches that shape individuals' PSM (Bright, 2016; Holt, 2019; Kim, 2021; Perry, 1997; Perry et al., 2008; Ward, 2019). However, apart from being perceived as a learning process in which adolescents acquire public values from these institutions, PSM could also be understood as positive emotional responses developed from a warm relationship. Unfortunately, except for an earlier study conducted by Perry (1997), our knowledge of how interpersonal relationships influence PSM is still scant. In the school setting, although the importance of teachers in shaping students' value perception has been well recognized (Jennings & Greenberg, 2009; Roth et al., 2011), studies in this vein fall short in their empirical testing. In addition, given that it is developed within a multitude of contexts, individuals' PSM tends to be formed as a result of the interactions among different socialization agents (e.g., parents and teachers). Scholars have thus called for a more nuanced examination of the factors contributing to the variations in the PSM level among individuals during their pre-employment phase (Kim, 2021; Perry & Hondeghem, 2008).

In response to the challenges inherent in the existing literature, the first objective of this study is to examine the effects of underexploited family and school antecedents on students' PSM. Moreover, considering that adolescents' PSM is developed in both family and school contexts, we test the combined effects of family- and classroom- level factors on shaping one's PSM. This study uses data from the China Education Panel Survey (CEPS), a nationally representative dataset that contains longitudinal information of 6,099 school-age students paired with their parents and teachers. Our results confirm that parent-child relationships, parental regulation, teacher-student relationships, and teachers' transformational leadership positively impact adolescents' PSM. We further find that a satisfying relationship between students and teachers significantly attenuates the influence of the parent-child relationship on PSM.

This study makes several contributions. First, it extends the boundaries of existing literature pertaining to PSM antecedents by adding new empirical insights, particularly from a relational perspective, into how PSM is originated and developed among adolescents. We empirically show that individuals' PSM can be better understood as a result of their emotional responses induced by relational processes. Second, this study echoes the suggestion of Kim (2021) to examine the interactive effects of school education and family on fostering adolescents' PSM. The associated findings suggest that the roles of parents and teachers are mutually substituting. Lastly, departing from an equity standpoint, this study sheds concrete light on the importance of education in shaping adolescents' PSM. While conventional wisdom holds that family-oriented childhood experiences have an irreversible effect on the emotional state of future adults, our results indicate that the differences in PSM values among adolescents caused by their original families can be significantly counteracted by quality education. In this regard, well-designed school

education, particularly a supportive student-teacher relationship, ought to be considered a crucial avenue to reduce the gap in PSM levels among social groups and ultimately help to materialize the goal of social equality.

The next section illustrates the theoretical background and hypotheses undergirding the family and school socialization antecedents of PSM. Detailed descriptions of the data source, measurement of the variables, and analytical approaches follow. We conclude by presenting the main findings and subsequently discussing their theoretical and practical significance.

Theory and hypotheses

Socialization and PSM

Defined as an individual's intrinsic proclivity to deliver services that benefit the interests of others at large, PSM stresses that rational, norm-based, and affective motives combine to drive individuals to choose public employment and work diligently thereafter (Perry & Vandenabeele, 2015). An important and ongoing research question discussed in the PSM literature concerns its origins. Although psychological literature pointed out the existence of innate differences in some PSM dimensions, such as compassion and self-sacrifice, across individuals (Costa et al., 2001), public administration scholars argue that the extent to which individuals' PSM develops and evolves largely depends on social influence. It is their belief that social power and structure can significantly change individuals' value systems and perceptions of public services. Many contextual and environmental elements embodied in the societal system are thus framed as socialization factors, which have been understood as the primary mechanism through which individuals' PSM develops and nurtures (Perry, 2000).

'Socialization, in a broader term, refers to the way in which individuals are assisted in becoming members of one or more social groups' (Grusec & Hastings, 2007, p. 1). In this process, major socialization institutions transmit long-held values to their individual members and followers, whose self-identities and perceptions of PSM are subconsciously guided. In his seminal work, Perry (2000) summarized two major socialization sources that were central to an individual's PSM, labelling them, respectively, in sociohistorical and motivational contexts. Specifically, the former refers to the environmental influence generated under the prework and nonwork settings, including the family, schools, and churches; motivational context then emphasizes situational factors in the workplace, such as job characteristics, work environment, and leadership styles. Perhaps due to the rich implications for organizational design and performance improvement, extant literature focused predominantly on examining the latter (Harari et al., 2017; Vandenabeele, 2011). However, substantial differences in PSM may already exist across employees before they join the workforce (Holt, 2019). Researchers ignore these factors at their own peril – not only biasing our estimates of the influence of organizational correlates on employees' PSM, but also leaving unsolved questions about how it is first instilled in individuals.

Table 1 summarizes the current literature on PSM antecedents at the pre-entry level. Within the realm of family socialization, parental modelling is the most well-understood mechanism that shapes one's PSM. Drawing data from 374 MPA students, for example, Perry (1997) found for the first time that parents' prosocial role models were positively

Table 1. Existing Antecedents of PSM at the Pre-Entry Level.

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Family	Parental modelling (Perry, 1997; Perry et al., 2008; Ward, 2019)
	Parents' occupation (Charbonneau & Van Ryzin, 2017; Vandenabeele, 2011) Family's political views (Kjeldsen, 2012; Charbonneau & Van Ryzin, 2017)
School	Work (volunteering) experience (Kim 2020; Bright, 2016; Holt, 2019; Perry et al., 2008)
	Civic course or specific programme (Perry, 1997; Kim 2020; Bright, 2016; Vandenabeele, 2011; Bright, 2016; Kjeldsen, 2012)
	Leadership experiences (Dunn, 2006; Ward, 2019)
	Peer relation (Kim 2020; Bright, 2016)
	School diversity (Holt & Choi, 2020)
Religiousness	Perry et al., 2008; Charbonneau & Van Ryzin, 2017

Note: Studies aiming exclusively at investigating the antecedents of PSM are included; PSM is operationalized using different measurement scales in these studies; The time span of this literature review was set from 1997 to 2020.

associated with children's PSM. In addition to parental modelling, parents' occupations and their political views were also found to be valid predictors of individuals' PSM. Vandenabeele (2011) discovered that individuals whose parents were both public servants developed an above-average level of PSM.

It merits mentioning that the studies described above are based mainly on social learning theory (Bandura, 1977), emphasizing learning as a core mechanism for individuals to obtain specific values attached to groups, organizations, and communities. However, the development of PSM, apart from being viewed as a social learning process, can also be understood as an other-oriented emotional response to relational and interactive processes. Psychology literature has revealed that adolescents' self-identity and interpersonal competency are highly dependent on social relationships in which reactions to others' emotions and behaviours constitute a primary part (Kienbaum et al., 2001). Additionally, compared to the learning-socialization process, relational-experience impacts are more profound, enduring, and ubiquitous because the psychological foundation they create is embedded in the trajectory of individuals' future prosocial development (Laible & Thompson, 2007). Taken together, it is worth testing the impact of relational socialization antecedents on adolescents' PSM.

In terms of school socialization, many factors, such as course curriculums (Bright, 2016; Kjeldsen, 2012), service involvement (Holt, 2019; Ward, 2019), and school environment (Holt & Choi, 2020) have so far been examined. Education scholars, for instance, have illustrated that teachers play a critical role in shaping students' moral values and civic identity, typically through personal interactions, role modelling, and classroom discipline (Obenchain et al., 2016; Sari, 2013). Following this line of research, we speculate that teachers have the opportunity to influence students' PSM, which is considered a subtype of civic and moral values. While some scholars have highlighted the importance of teachers in shaping students' ideologies (Jennings & Greenberg, 2009; Roth et al., 2011), few have empirically winnowed their focus to adolescents' PSM.

Furthermore, it is apparent that individuals' PSM develops in a complex context in which different socialization processes simultaneously take effect. However, the vast majority of existing studies are devoted to evaluating the effects of a single socialization agent. While a handful of scholars have probed the influence of institutions on PSM, their work is based on the assumption that the impacts stemming from socialization agents are independent of each other (Camilleri, 2007; Perry, 1997). As a result, questions of how different socialization forces are intertwined to shape individuals' PSM persist (Kim, 2021).
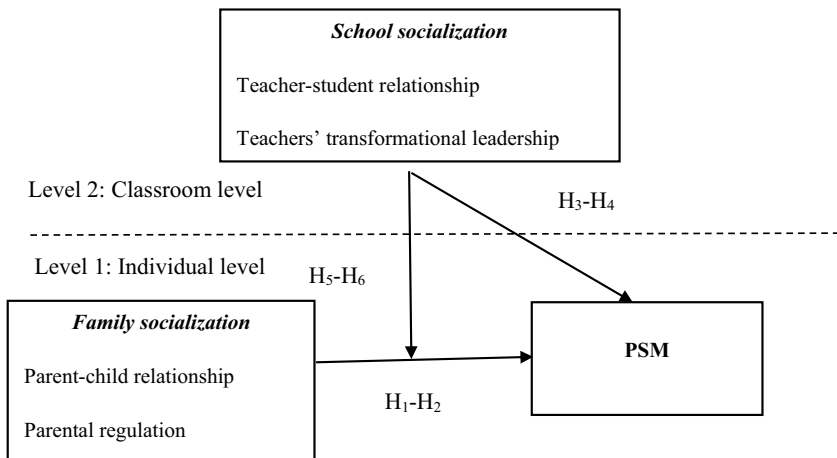
Figure 1. Socialization Antecedents of PSM: A Multilevel Model.

Building on the process theory of PSM developed by Perry (2000), Figure 1 presents a model that considers both family and school socialization possibilities. As Figure 1 illustrates, the model begins with the direct effects stemming from parents and teachers, who are the two primary agents shaping adolescents' PSM. More importantly, as the time periods of family and school socialization processes overlap, the interplay between these two types of institutional socialization will also profoundly shape or sway adolescents' PSM-related values. Next, we discuss in detail the theoretical underpinnings of all formulated hypotheses under empirical examination.

Family socialization and PSM

Socialization in the family is the starting point for cultivating individuals' PSM. As Perry (1997) noted, the family consists of the primary context for socialization in America. Although many related agents may be involved in a family context, parents are expected to play a major and irreplaceable role in socializing children (Grusec & Hastings, 2007). The influence of parents on a child's prosocial values is also likely to be the deepest and most lasting because early socialization provides a psychological foundation for further social development (Dunn, 2006). A large body of literature has examined the influence of family backgrounds, such as parents' career and prosocial behaviours, on individuals' PSM (Chen et al., 2021; Kjeldsen, 2012; Vandenabeele, 2011). However, few studies have explored family socialization from the perspective of relationships and interactions. Thus, this study focused on the effects of both the parent-child relationship and parental regulation on the development of adolescents' PSM.

Parent-child relationship
Developmental theorists have demonstrated that children's affective attributes, such as sympathy and concern for others, are largely derived from the perception of the latter's emotional states (Kienbaum et al., 2001). A positive parent-child relationship represents a warm, responsive, and cooperative emotional response from parents. According to the

social cognition theory (Bandura, 2001), children having positive relations with their parents are provided with constant opportunities to develop their social cognition ability, which refers to the capacity to recognize the feelings, emotions, and meanings of others (Shantz, 1975). Compared with their counterparts whose emotional ability is less developed, for instance, children with a better understanding of the psychological state of others are found to exhibit greater compassion that is indicative of PSM abundance (Repacholi et al., 2003).

Furthermore, having a close kinship also functions as an implicit altruistic cue that motivates children to respond as friendly and affectionately to others as how they are treated in the family context. Existing literature has indeed shown that youths' perception of connectedness with parents significantly contributes to their altruism towards peers (Clark & Ladd, 2000). In a longitudinal study, Feldman (2007) further demonstrated that mother-infant synchrony strongly predicted empathy levels among adolescents. In addition, quality parent-child relationships augur well for children's prosocial behaviours. That is, adolescents with good parent-child relationships are more likely to engage in voluntary work (Zaff et al., 2003), donate money to others (Carlo et al., 2010), and exhibit high levels of kindness to strangers (Lee et al., 2017). As altruism and prosociality largely resemble the self-sacrifice and compassion dimensions of PSM, we can expect that a good parent-child relationship will exert positive effects on those of adolescents:

> **Hypothesis 1 (H₁): Good parent-child relationships are positively associated with adolescents' PSM.**

Parental regulation

Parental regulation is an essential part of the socialization process for children. [1] Parents do so by setting everyday routines, rules, and expectations for children's behaviour as well as by undertaking monitoring activities (Hastings et al., 2007). These regulations not only shape adolescents' immediate behavioural patterns, but also generate lingering motivational consequences. Age-appropriate, regulatory parenting can help children withstand negative influences from the environment, such as bullying peers and involvement in unethical behaviours, which are risk factors that severely undermine one's prosocial values and orientations. For instance, Pratt et al. (2003) found that adolescents whose parents set clear rules and expectations for them reported high levels of altruism to others. Similarly, Zaff et al. (2003) demonstrated that adolescents are more likely to participate in volunteering when their parents strictly regulate their daily behaviour. Thus, it is expected that proper and adequate regulations from parents are associated with a higher level of PSM in children:

> **Hypothesis 2 (H₂): Stringent behaviour regulations in the family are positively associated with adolescents' PSM.**

School socialization and PSM

Besides providing students with academic knowledge, the school also serves as an important socialization venue in promoting prosocial values and behaviours. Current literature has established positive links between education and PSM. Notably, these studies investigate the impact of education level (e.g., Camilleri, 2007; Vandenabeele,

2011), specific curricula (Bright, 2016; Kjeldsen, 2012), extracurricular activities (Perry et al., 2008; Ward, 2019), and experiences in school life (Holt & Choi, 2020; Kim, 2021) on promoting one's PSM. However, little attention has been paid to exploring the connection between educators, namely teachers, and students' PSM. Teachers can transmit public values directly to students by disseminating civic knowledge, leading discussions on societal issues, and encouraging altruistic behaviours. They can also indirectly make a student understand the importance of prosocial values by role modelling, creating a democratic atmosphere, and initiating amicable interactions. By doing so, students internalize public values and norms and develop specific identities. Given the important role of teachers in shaping adolescents' value perception and motivation, more research is needed to explore the extent to which teachers can influence students' PSM.

In the Chinese secondary school system, the class is an important unit in which students spend most of their time attending courses and participating in extracurricular activities. A head teacher (*banzhuren*) is responsible for managing the class and guiding individual students' mental and intellectual development (Ministry of Education of the People's Republic of China, 2009). Head teachers usually meet students in class on a daily basis through instructional activities. They also meet students individually to solve the problems they encounter, thus exerting an unparalleled influence on the belief systems of adolescents. Following this line of reasoning, this study focuses on the role that head teachers play in the development of adolescents' PSM.

Teacher-student relationship

Similar to the parent-child relationship, a close teacher-student relationship can be characterized by warmth and affection, which support children's development of emotional ability. Yet, there are also clear distinctions between parent-child and teacher-student relations. The most obvious is that the bond between parents and children is biological, while the linkage between teachers and students is formed in the social system (Grusec & Davidov, 2007). Compared with biological relatedness gained from parents, social relatedness from teachers helps adolescents sense the existence of community and social norms, which in turn cements their prosocial values and the likelihood of such behaviours (Birch & Ladd, 1997; Ferreira et al., 2016; Wentzel, 2009). Conceivably, students are more likely to internalize the values taught by teachers who share supportive relationships with them. Teachers can also instil communal ideologies in students and inform them of what they need to do to become valuable and civic-minded citizens. Although direct empirical evidence of teachers' influence on students' PSM is quite limited, a growing body of literature on organizational leadership research has demonstrated a positive correlation between leader-member exchange and employees' PSM (Camilleri, 2007). As headteachers in classes are more or less comparable to leaders in organizations, we expect that a warm teacher-student relationship positively contributes to students' PSM:

> **Hypothesis 3 (H$_3$): A close teacher-student relationship is positively related to students' PSM.**

Transformational leadership

Transformational leadership is referenced as the practice of inspiring subordinates to move beyond their self-interests to do good for organizations or the broader society (Bass & Riggio, 2006). It is generally characterized by three types of behaviours including charismatic modelling, intellectual stimulation, and inspirational consideration (Burns, 1978). Transformational leaders have the ability to act as role models, encourage creative problem solving, and communicate a compelling vision that arouses vibrant emotions. While the transformational leadership model was originally developed in management literature, it has been extensively utilized by education researchers because teachers in a classroom mirror leaders in the organizational context (Bass, 1999). Hence, a teacher with a transformational leadership style emphasizes a collective vision and earns respect from students, uses interactive pedagogical approaches to arouse creative thinking, and sacrifices personal time to help students solve problems. Studies have found that teachers practicing a transformational style have positive impacts on various dimensions of their students, including cognitive learning, intrinsic motivation, and performance (Bolkan & Goodboy, 2009; Tucker et al., 2010).

More notably, recent public administration literature has theoretically and empirically linked transformational leadership with PSM, which is generally understood as an individual's inclination to do good for others or for a larger community (Vandenabeele, 2007). The altruistic nature of PSM corresponds seamlessly with transformational leadership, which advocates that employees look beyond their self-interests. Scholars have also shown that leaders who successfully enhance their followers' PSM are devoted to clarifying a prosocial vision (Andersen et al., 2018), highlighting prosocial impacts (Wright et al., 2012), and creating a supportive atmosphere (Fazzi & Zamaro, 2016). Thus, it seems highly probable that teachers who engage in transformational leadership have the ability to foster students' PSM in a classroom setting:

> **Hypothesis 4 (H₄): Head teachers' transformational leadership is positively related to students' PSM.**

Cross-level interactive effects between family and school socialization

It is a logical deduction that the cultivation of one's PSM in early childhood is rarely due to a single agent, but is shaped by the interaction of both family and school socialization effects. Developmental systems theory (Ford & Lerner, 1992) argues that children's psychological development is embedded within a multilevel and hierarchical system. Social ties at one level may have consequences for those formed at other levels. For instance, the way children interact with their parents will guide their subsequent dealings with teachers; similarly, an accommodating teacher may reshape the dynamics of a child's relationship with parents. Put differently, individuals' prosocial values and behavioural patterns are influenced and even shaped by the interactions among different relational ties at various levels (Sabol & Pianta, 2012). A classical study found that children's relationships with their mothers and teachers combined to dictate their development of sympathy and prosocial behaviours (Kienbaum et al., 2001).

In our study, the fact that both teachers and family members play independent roles in shaping adolescents' PSM does not exclude the possibility that one moderates the influence of the other. Adolescents who are likely to develop low levels of PSM due to

poor family relationships may yet be empowered by nurturing relationships outside of the family, such as positive teacher-student interactions. Empirical evidence suggests that the teacher-student relationship serves as a significant moderator between family socialization and adolescents' moral development. For example, Wang et al. (2013) found that the teacher-student relationship significantly reduces the effects of parent-adolescent conflict on adolescents' ability to understand and manage their emotions. Similarly, another researcher found that a strong sense of school connectedness significantly attenuates the impacts of family relations on potential behavioural problems (Loukas et al., 2010). Following this line of thought, we are therefore compelled to speculate that teacher-student relationships can also moderate the association between adolescents' relationships with their parents and their PSM:

> **Hypothesis 5 (H$_5$): The teacher-student relationships moderate the connection between adolescents' PSM and their parent-child relationship.**

Additionally, it is our belief that teachers' transformational leadership may influence not only adolescents' PSM, but also the relationship between it and parental regulation. Transformational teachers create positive emotional cues for students, who subsequently become more adept at other-regarding considerations, creative problem solving, and free expression. This implies that teachers can contribute to adolescents' development of affective competence by serving as a protective factor that buffers problematic influences from parental regulation (Thurman et al., 2018). Empirically, scholars found that quality education, by reducing the likelihood of delinquent behaviour among children lacking sufficient caring at home, served as an ideal substitute for family socialization (Hoffmann & Dufur, 2008). Specifically, an educational atmosphere renders individuals intrinsically motivated and reduces the legitimacy of behavioural regulation in the family socialization process. Students who constantly interact with transformational teachers are thus less likely to follow authoritarian instructions from parents. We thus argue that the PSM impacts of parental regulation on adolescents may be weakened by the latter's interaction with transformational 'leaders' in a school setting:

> **Hypothesis 6 (H$_6$): Transformational leadership on the part of teachers will moderate the relationship between parental regulation and adolescents' PSM.**

Data and methods

Data source and samples

We analyse data drawn from the China Education Panel Survey (CEPS). Cooperating with 19 local universities and institutions, the CEPS is the first national and longitudinal survey to study the linkages between students' educational outcomes and multiple contexts of family, school, community, and social structure. It applies a stratified, multistage sampling design with a probability proportional to size (PPS) from 112 schools across 28 counties/districts in China. A total of 10,279 Chinese 7th graders were surveyed in 2013 as the first wave and resurveyed the following year. As 9,449 students were successfully traced in the second round, the follow-up rate was 91.9%.

The CEPS organizes four different sets of questionnaires to target students and their parents, teachers, and school administrators.[2] The different levels of information provided by CEPS are particularly useful for this study, as our overarching aim is to investigate the impacts of both family and school socialization on adolescents' PSM. The stage of adolescence was targeted because it is a time of transition from childhood to emerging adulthood, which has been regarded as a critical period for prosocial value development (Hardy & Carlo, 2011). Compared to young children, adolescents have a higher capacity for moral reasoning and abstract thinking, which helps them to better understand and internalize prosocial values (Eisenberg et al., 2009). In addition, compared to adults, adolescents are at the stage in which their personal values and ideologies are still forming (Hardy & Carlo, 2011). This means that adolescents are likely to be more impressionable and sensitive to environmental cues from both parents and teachers. Furthermore, they are understudied in the current PSM research. Due to the fact that adults have been employed longer, their PSM levels have been intensively influenced by the work environment (Vandenabeele, 2011). Thus, the adolescent sample will give us an opportunity to analyse the 'pure' effects of family and school socialization on developing PSM in isolation without the influence of work environments.

This study utilizes both baseline and follow-up data. However, while CEPS is used to collect longitudinal data over two years, PSM-related items are only measured in the second wave. The data associated with the dependent variable (PSM) are thus from the student survey in the follow-up wave (students = 8th graders; in 2014), whereas the data regarding the independent and control variables are from surveys taken by students, parents, and teachers in the baseline wave (students = 7th graders; in 2013). After dropping missing variables, we were able to match 6,099 students with 171 teachers[3].

According to previous research on the antecedents of PSM, a minimum sample size of 348 subjects from nationally representative panel data were needed to detect the significant effects of interest (Vogel & Kroll, 2016). It must be noted that considerably larger samples of 3,592 (Kim, 2021) and 5,380 (Holt, 2019) were utilized in other studies of nationally representative datasets. Our study included the largest sample of 6,000 subjects, suggesting that it is more than sufficient to detect a meaningful effect size with regard to the antecedents of PSM-related values. In addition, we conducted a formal power analysis using GPower software. Assuming a small effect size of 0.1, power analysis suggests that having 1,287 subjects will result in a power of 0.95. In this regard, our sample size greatly exceeds the minimal sample size required for a reliable estimation.

Measures

Several methods were utilized to avoid common method bias (CMB). First, we obtained data from different sources, including self-reported responses from students, parents, and teachers, and objective archival data that show learners' academic performance (i.e., exam scores). In fact, using diverse data sources was recommended as one of the best solutions in public administration research to avoid CMB (Favero & Bullock, 2015). Second, it can be alleviated by measuring the independent and dependent variables at separate times (Podsakoff et al., 2003, 2012). Thus, we selected our independent variables from the first wave of CEPS and PSM (dependent variable) from the second to reduce temporary bias. In addition, social desirability is an important source of CMB,

particularly in countries with a collectivistic cultural tradition (Kim & Kim, 2016). In this study, fortunately, PSM measurement items and other questions measuring independent variables originated from a large-scale educational survey. This implies that respondents were highly unlikely to be aware of the purpose of our study and provided socially desirable responses. Further, the survey distribution and collection were conducted by independent education agencies for academic purposes. Confidentiality and anonymity were guaranteed. Thus, we believe that CMB may not pose a serious risk to this study.

PSM

Inspired by previous studies demonstrating that the abbreviated measure of PSM-related values shares an equivalent utility with the multidimensional PSM measure (Holt, 2019; Kim, 2021, 2017; Ward, 2019), we employed three related items to gauge it[4]. We utilize PSM-related values rather than PSM to emphasize that the former is not tantamount to the latter despite the fact that they share many conceptual similarities. Measured on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*), students' intentions to engage in prosocial behaviours were sought. Although these are different from the well-established PSM measurement scale (e.g., Kim et al., 2013; Perry, 1996), they reflect two of its four core sub-dimensions, including commitment to public interest and compassion. For example, one sample item is: '*I am willing to help elderly people*'. This essentially corresponds to the dimension of compassion. Another sub-dimension, commitment to the public interest and civic virtue, is embedded in students' perceptions of the importance of being rule-abiding citizens. The Cronbach's alpha coefficient of this aggregate index of PSM-related values was 0.66.[5]

Parent-child relationship

The parent-child relationship is measured on a revised scale from Park et al. (2004). It consists of six items that ask students about their relationship with parents (e.g., *How do you view the relationship between you and your parents?*), the frequency of close interactions with parents (e.g., *How often do you discuss the things happening at school with your parents?*), and how much time do their parents spend with them (e.g., *How often do you and your parents do the readings together?*). To obtain a composite score with high internal consistency, several items originally coded on a 5-point Likert scale were re-coded on a 3-point one. In addition, items that separately measured mothers or fathers were merged into a single item referring them as 'parents'. The variable Cronbach's alpha coefficient was 0.74, and its construct validity was further tested by confirmatory factor analysis (CFA). The results suggest that our three-factor measurement model fits well with the sample data and is a good indicator of the parent-child relationship (χ^2 = 38.4; CFI = 0.99, GFI = 0.99, RMSEA = 0.03).

Parental regulation

Parental regulation is measured by eight items adapted from Vansteenkiste et al. (2014) and Winne and Perry (2000). This consists of three regulations: academic, extracurricular activities, and social media. Sample items include: '*My parents set limits for those I make friends with*'; '*Are your parents strict about your school performance?*'; and '*My parents set limits for the time I spend surfing the internet*'. All use a four-point Likert scale ranging from

1 = *strongly disagree* to 4 = *strongly agree*. The composite reliability of the scale was 0.75. CFA analysis also indicated that the hypothesized model fit the data well (χ^2 = 636.7; CFI = 0.94, GFI = 0.98, RMSEA = 0.07).

Teacher-student relationship

The teacher-student relationship is measured by three items that are based on the Teacher-Student Relationship Inventory (Hughes et al., 2005). On a 4-point Likert scale, students expressed views about their perceived support (e.g., *My head teacher always praises me*) or conflicts in their relationship (e.g., *My head teacher always criticizes me*) with head teachers. The negatively framed item was reverse-coded to obtain a composite score. As the teacher-student relationship is a class-level variable, it was generated by aggregating the mean scores of each student in that class. To test whether the aggregation from the individual- to class- level is reliable, ICC (1) and ICC (2) were utilized to reflect the reliability of aggregated means (Bliese, 2000). We obtained an ICC (1) value of 0.11 and ICC (2) value of 0.82 (F = 5.53, p < 0.001), indicating that individual-level scores are homogenous within a class and the aggregated mean values are reliable.[6] Thus, we used the aggregated teacher-student relationship as our class-level variable in the model. CFA further illustrates the goodness of fit of the model (χ^2 = 1.46; CFI = 0.99, GFI = 0.99).

Transformational leadership

This study measured transformational leadership using five items (Bolkan & Goodboy, 2010),[7] each of which was assessed on a 4-point Likert scale. Specifically, head teachers' behaviours and attitudes towards students were evaluated against several dimensions, including the extent to which they used an interactive pedagogical style (e.g., *Do you use teacher-student discussion as a teaching method?*), encouraged students to solve problems (e.g., *Would you encourage the students with poor performance to continue their studies after graduating from middle school?*), and acted as a charismatic leader (e.g., *On the whole, do the students in this class respect you?*). Details on the operationalization of all focal variables can be found in Appendix B.

Control variables

Three variables were selected to control factors that could confound the influence of families and teachers on individuals' PSM. In line with the prior literature on its demographic antecedents (Parola et al., 2019; Ritz et al., 2016), we controlled students' age, gender, and ethnicity. We coded ethnicity as a binary variable equalling to one if they are Han (the majority ethnicity in China), and zero otherwise. In addition to these demographic features, academic performance also influences students' PSM (Kim, 2021). Those with higher academic scores may have more time to participate in volunteer activities and develop prosocial values. Academic performance, measured by an aggregated index containing standardized exam scores of both Chinese, maths, and English courses, was thus included. In terms of family characteristics, we incorporated parents' education levels and occupations into the model. As education level has been found to be positively associated with PSM (e.g., Kjeldsen, 2012; Ward, 2019), we can expect that a service-motivated, well-educated parent may enhance their children's perceptions of morality. Additionally, studies have shown that college graduates are more likely to be high in

prosocial values and devote themselves to governmental work if their parents hold public sector jobs (Charbonneau & Van Ryzin, 2017; Vandenabeele, 2011). Thus, we coded parents' occupation as 0 for those whose parents engaged in public service and 1 otherwise. Finally, we controlled teachers' prosocial values and job satisfaction. This is because the latter may be correlated with students' PSM. That is, when teachers are satisfied with their work, they are more likely to help students out and create a supportive and reciprocal classroom environment. We measured prosocial values with a single item, *'Do you agree that schools should be more responsible than families in promoting children's participation in public affairs*?' Likewise, despite the fact that job satisfaction is a multidimensional concept, one item was used to measure it for teachers in our study: *'generally speaking, are you satisfied with your current work as a head teacher*?'

Analytical approach

Due to the nested structure of the CEPS data, a two-level hierarchical linear modelling (HLM) was utilized in this study to test the hypotheses. HLM entertains multilevel variables in the same regression equation, allowing us to not only differentiate PSM variances at the student and classroom levels but also estimate the effect sizes of different-level predictors simultaneously (Raudenbush & Bryk, 2002). Following Aguinis et al. (2013), we conducted HLM in four steps to test the main and moderation effects. First, the null model examining variances in students' PSM within and between classrooms was performed to determine whether conducting a multilevel analysis is necessary. Second, we ran the random-coefficient model to assess the effects of student-level predictors on PSM. The intercepts-as-outcomes model tested the effects of classroom-level predictors on the intercept of PSM. Finally, the slopes-as-outcome model was applied to examine the cross-level inter-action effects. The specifications of the slopes-as-outcome model are listed below. The equations for the other three models are presented in Appendix A.

Level 1: Student

$$PSM_{ij} = \beta_{0j} + \beta_{1j}(parent-child\ relationship) + \beta_{2j}(parental\ regulation)$$
$$+ \beta_{3j}(academic\ performace) + \beta_{4j}(Parents'\ occupation)$$
$$+ \beta_{5j}(Parent'\ highest\ education) + \beta_{6j}(gender) + \beta_{7j}(ethnicity) + \beta_{8j}(age) + r_{ij}$$

Level 2: Classroom

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(Teacher-student\ relationship) + \gamma_{02}(Transformational\ leadership)$$
$$+ \gamma_{03}\left(Teachers'\ prosocial\ values\right) + \gamma_{04}(Teachers'\ job\ satisfaction) + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}(Teacher-student\ relationship) + \gamma_{12}(Transformational\ leadership) + \mu_{1j}$$

$$\beta_{2j} = \gamma_{20} + \gamma_{21}(Teacher-student\ relationship) + \gamma_{22}(Transformational\ leadership) + \mu_{2j}$$

$$\beta_{3j} = \gamma_{30} + \mu_{3j}$$

$$\beta_{4j} = \gamma_{40} + \mu_{4j}$$

$$\beta_{5j} = \gamma_{50} + \mu_{5j}$$

$$\beta_{6j} = \gamma_{60} + \mu_{6j}$$

$$\beta_{7j} = \gamma_{70} + \mu_{7j}$$

$$\beta_{8j} = \gamma_{80} + \mu_{8j}$$

In our statistical model, level-1 specifies PSM as the outcome variable, the parent-child relationship and parental regulation as explanatory variables, and a set of individual-level control variables. The teacher-student relationship, transformational leadership, and two classroom-level control variables were included in the level-2 equation. The restricted maximum likelihood (RML) was used to estimate the regression coefficients and variance components. All continuous independent variables were centred on the grand mean to avoid multicollinearity. As CEPS data are collected based on the sampling strategy of probability proportional to size (PPS), the student-level weight is employed in the HLM to counteract unequal sample selection probabilities. The overall model fit is evaluated by the deviance (–2 log-likelihood), with smaller values indicating a better explanatory power of the model. In addition, the intraclass correlation coefficient (ICC) was calculated to assess the appropriateness of the HLM approach. The HLM 7 software was used to perform the analysis.

Empirical results

Descriptive statistics of the variables are presented in Table 2. Students in middle school exhibit a high level (a mean of 3.83/4) of PSM. This result is consistent with previous studies that utilized student samples in China (Chen et al., 2020) and other Asian countries (Kim, 2021). Male students were slightly higher than their female counterparts. With regard to ethnicity, minority groups account for approximately 7%

Table 2. Descriptive Statistics of Variables.

Variables	Source	N	Mean	SD	Min	Max
Individual-level						
PSM	Students	6,099	3.83	0.74	1	5
Parent-child relationship	Students	6,099	2.04	0.47	1	3
Parental regulation	Students	6,099	2.39	0.38	1	3
Gender	Students	6,099	0.51	0.5	0	1
Age	Students	6,099	13.85	0.83	12	18
Ethnicity	Students	6,099	0.93	0.25	0	1
Academic performance	Archival data	6,099	70.91	8.03	22.87	92.03
Parents' occupation	Parents	6,099	0.08	0.28	0	1
Parents' highest education	Parents	6,099	1.48	0.78	1	4
Classroom level						
Teacher-student relationship	Students	171	2.36	0.21	1.69	3.03
Transformational leadership	Teacher	171	2.91	0.43	1.6	4.00
Teacher's gender	Teacher	171	0.37	0.49	0	1
Teacher's job satisfaction	Teacher	171	3.48	0.9	1	5

Note: Gender: Female =0, Male = 1; Ethnicity: Minority = 0, Majority = 1; Parents' occupation: public sector = 0, otherwise = 1. Teacher-student relationship is calculated using student-level values at the average aggregate level.

of the total students, which is similar to the proportion of the minority population in China. The parents' occupation score was 0.08, indicating that most were not public sector employees. As indicated previously, the teacher-student relationship was treated as a class-level variable that averages student-level scores. The mean value of this variable was 2.36. Because the teacher-student relationship is operationalized on a scale between 1 and 3, a figure greater than 2 indicates that they share a relatively warm relationship.

Table 3 presents the results of the zero-order correlations among the variables at the individual level. Multicollinearity appears not to be a serious concern, as all correlations among the variables are below 0.5. The results of the correlation indicate that PSM is significantly correlated with all the independent variables. Specifically, gender (female = 0; $r = -0.11$, $p < 0.01$) and age ($r = -0.05$, $p < 0.01$) were negatively correlated with PSM. Other variables, including ethnicity (minority = 0; $r = 0.03$, $p < 0.01$), parents' occupation ($r = 0.04$, $p < 0.01$), and academic performance ($r = 0.11$, $p < 0.01$), were positively correlated with PSM. There was also a positive correlation between parent-child relationship and parental regulation ($r = 0.28$, $p < 0.01$). It appears that preliminary support is lent to Hypotheses 1 and 2, as PSM is positively correlated with both the parent-child relationship and parental regulation at a statistically significant level.

Due to the nested data structure, we relied on hierarchical linear models to simultaneously estimate the effects of variables at two levels to predict students' PSM. First, we constructed the null model (model 1), in which variables at neither the family nor the classroom level were included in order to examine whether substantial variations in individual-level PSM can be attributed to the differences in classes[7]. As shown in Table 4, despite the fact that most of the variance in PSM occurred at the individual level, approximately 9% of the variability can be explained at the class level ($\chi^2 = 742.56$, $p < 0.01$). This illustrates that multilevel modelling is indeed needed to differentiate PSM variances between individual and classroom levels.

Subsequently, we ran the random-coefficient regression model (model 2), which estimated the relationships between two individual-level variables and PSM only. Six control variables, including gender, ethnicity, age, academic performance, parents' occupation, and parents' highest education, were incorporated into this model. As expected, the parent-child relationship was significantly positively correlated with PSM ($\gamma = 0.23$, $p < 0.01$). Compared with those whose relationship with parents is tense or troubled, students who experience a warm parent-

Table 3. Zero Order Correlation Matrix of Individual-Level Variables.

Variable	1	2	3	4	5	6	7	8	9
1. PSM									
2. Parent-child relationship	0.22***								
3. Parental regulation	0.17***	0.28***							
4. Academic performance	0.11***	0.04***	0.04***						
5. Gender	−0.11***	−0.03**	−0.04**	−0.25***					
6. Age	−0.05***	−0.1***	−0.04**	−0.09***	0.09***				
7. Ethnicity	0.03***	0.08***	0.01	−0.02	0.00	−0.29***			
8. Parents' occupation	0.04***	0.14***	−0.00	0.07***	−0.02	−0.05***	0.00		
9. Parents' highest education	0.09***	0.23***	0.01	0.07***	−0.02	−0.06***	0.23**	0.48***	

Note: Gender: Female =0, male = 1; Ethnicity: Minority = 0, Majority = 1; Parents' occupation: public sector = 0, otherwise = 1. **p < .05, ***p < .01 (2-tailed)

**Table 4.** Results of Hierarchical Linear Models that Predict PSM.

PSM	Model 1		Model 2		Model 3		Model 4	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Base (γ_{00})	3.77***	0.02	2.5***	0.29	2.58***	0.4	3.38***	0.29
Parent-child relationship			0.23***	0.03			0.24***	0.03
Parental regulation			0.18***	0.03			0.17***	0.04
Teacher-student relationship					0.28***	0.11	0.16	0.10
Transformational leadership					0.11*	0.06	0.08*	0.05
Age			−0.01	0.02	−0.02	0.01	−0.01	0.02
Gender			−0.09***	0.03	−0.10***	0.03	−0.1***	0.03
Academic performance			0.01***	0.00	0.01***	0.00	0.01***	0.00
Ethnicity			0.04	0.05	0.04	0.05	0.04	0.05
Parents' highest education			0.05**	0.02	0.07***	0.02	0.05***	0.02
Parents' occupation			−0.13**	0.05	−0.11**	0.05	−0.13**	0.05
Teachers' teaching values					−0.01	0.05	−0.01	0.05
Teachers' job satisfaction					−0.04	0.02	−0.02	0.02
Parent-child relationship *Teacher-student relationship							−0.28**	0.12
Parental regulation *Transformational leadership							−0.02	0.09
Random effects								
Individual-level variance	0.52		0.49		0.51		0.49	
Classroom-level variance	0.05		0.03		0.04		0.03	
ICC	0.09		0.06		0.07		0.06	
Chi-square	742.56***		536.39***		584.67***		422.0***	
Deviance (−2 log-likelihood)	13,520.03		13,256.42		13,441.94		13,255.47	

Note: Students N = 6,099, teachers N = 171. Model 1: the null model. Model 2: the random-coefficient regression model. Model 3: the intercepts-as-outcomes model. Model 4: the slopes-as-outcomes model. Gender: Female =0, Male = 1; Ethnicity: Minority = 0, Majority = 1; Parents' occupation: public sector = 0, otherwise = 1. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

child relationship are more likely to have high levels of PSM. In addition, the relationship between parental discipline and PSM was also statistically significant and positively associated ($\gamma = 0.18$, $p < 0.01$). When other individual-level factors are held constant, a one-standard-deviation increase in parental regulation corresponds to an 18-percentage point surge in PSM values. In comparison with the null model, the deviance value is greatly reduced in Model 2, indicating that adding individual-level variables significantly improves the overall model fit. In sum, Hypotheses 1 and 2 were supported.

Moreover, the intercepts-as-outcomes model (Model 3) was used to test all class-level hypotheses. The results showed that the teacher-student relationship significantly predicted students' PSM ($\gamma = 0.28$, $p < 0.01$). Holding other variables constant, a one-standard-deviation increase in the teacher-student relationship is associated with a 28-percentage point spike in PSM at a statistically significant level. That is, students who have close relationships with their head teachers tend to be more public-spirited. Likewise, in line with our expectation, transformational leadership was found to be positively related to students' PSM ($\gamma = 0.11$, p < 0.1). This demonstrates an instrumental role that teachers' leadership style can play in helping students become more altruistic and prosocial. Taken together, Hypotheses 3 and 4 were substantiated.

Lastly, the slopes-as-outcomes model (Model 4) was used to test the cross-level interaction effects. Namely, two class-level variables – the teacher-student relationship and transformational leadership – are entered into the model as moderators. The results show that the correlation between the parent-child relationship and PSM becomes dramatically weaker when the impact of the teacher-student relationship is at play ($\gamma = -0.28$, p < .05). This indicates that changes in adolescents' PSM are
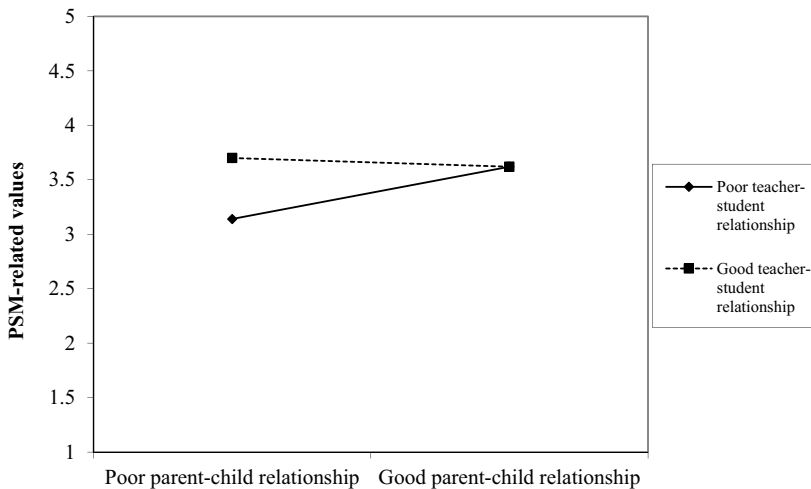
Figure 2. Cross-Level Interaction between Parent-Child Relationship and Teacher-Student Relationship for PSM-Related Values.

contingent upon both family socialization and teacher influence. The interaction effect was plotted in Figure 2. Clearly, adolescents with poor relationships with both their parents and headteachers showed the lowest level of PSM-related values. Furthermore, the influence of headteachers appeared to be stronger than the socializing role of parents on adolescent development of pro-sociality. This is evidenced by the fact that whether or not adolescents have good relationships with their parents, they are still able to maintain relatively high PSM-related value scores as long as they get along well with their headteachers. It must be noted that the reverse is not necessarily true. Nevertheless, transformational leadership presents as a statistically insignificant moderator between parental regulation and PSM ($\gamma = -0.02$, $p = 0.48$). This interaction effect was plotted and included as Appendix C. The magnitude of the impact of parental regulation on adolescents' PSM does not depend on the presence or absence of the headteacher's transformational leadership. In short, Hypothesis 5 was supported, whereas Hypothesis 6 was not.

Discussions and conclusions

Research on PSM has morphed into one of the most promising strands of public administration scholarship. However, non-workplace antecedents of PSM remain understudied. This study aims to take a step towards filling this lacuna by examining the individual and interactive effects of family and school socialization on adolescents' PSM. Based on a nationally representative sample, our findings suggest that while family level and classroom-level factors are valid predictors of PSM among middle school students, the extent to which family socialization affects adolescents' PSM depends noticeably on teachers' influence.

Theoretical contribution

The contributions made by this study are manifold. The first is by shedding empirical light, particularly from a relational perspective, on how societal institutions shape PSM among adolescents. The findings indicate that teacher-student and parent-child relationships positively contribute to adolescents' PSM. In his seminal work that sampled 295 MPA students, Perry (1997) demonstrated the theoretical importance of relationships in cultivating PSM but failed to find a significant association between parent-child relationships and individuals' PSM. This might be attributed to the convenience sampling strategy. To the best of our knowledge, our study is one of the first pioneering efforts to capitalize on a representative national dataset to examine the connection between relations and PSM.

Additionally, conventional wisdom on the sources of PSM commonly holds that individuals acquire and internalize its values mainly through a learning process that takes the form of role modelling, attending civic courses, and engaging in volunteer activities (e.g., Holt, 2019; Li et al., 2021; Perry et al., 2008). Nonetheless, our evidence supports the argument that the cultivation of PSM should also be understood as other-oriented emotional responses developed from relational and interactive processes. This finding not only aligns with a recent study that discovered the significant role that peer relationships play in enhancing students' PSM (Kim, 2021), but also provides additional insights by confirming that both parents and teachers are critical determinants of adolescents' PSM. Individuals who hold close and harmonious relationships either in the family or in school are more likely to be high in PSM.

This study also echoes the scholarly call (Kim, 2021; Perry & Hondeghem, 2008) to scrutinize the cross-level effects of different socialization agents as antecedents of PSM. A fundamental premise inherent in its studies is that PSM is formed through a blend of different contextual factors (Perry, 2000; Perry et al., 2008). However, except for a recent article examining how leadership style moderates the relationship between an individual's personality and PSM (Liu et al., 2018), the mainstream literature unvaryingly assumes that different socialization effects are independent of each other. Thus, our study enriches the current work by examining how families and schools interact to shape adolescents' PSM. The associated findings lend empirical support to the argument that the development of one's PSM at the pre-entry level is through the synergy of various socialization processes, offering a further glimpse into the black box of its origins and evolutionary paths.

Finally, our empirical evidence supports a substitution, instead of a mutually reinforcing relationship, between parents and teachers in shaping adolescents' PSM. This implies that the impact of teachers is capable of attenuating rather than strengthening parents' influence on adolescents' PSM. Specifically, our findings indicate that the association between the parent-child relationship and PSM is significantly weakened when the teacher-student relationship is considered at the same time. As counterintuitive as it sounds, this finding makes sense in hindsight. Research has shown that high quality school education compensates for poor parental care and assists immensely in the academic achievement and social development of adolescents (Buysse, 1997; Parcel & Dufur, 2001). Similarly, adolescents who are exposed to a relaxing school

environment tend to sense positive emotional cues from and listen receptively to the thoughts shared by their relatable teachers. As a corollary, headteachers have the potential to make a difference in the magnitudes of the impacts of parents on adolescents' PSM.

Practical implications

Educators have pondered whether and how education can enhance individuals' social values and altruistic orientations. Unlike adults, whose perceptions of public interests are fully formed and fixed, school-age youth are at a stage where their personal ideologies are still malleable and, therefore, shapeable. That is, policy efforts that aim to instil a public and civic mindset into individuals are more likely to come to fruition among adolescents than adults. This fundamentally explains our impetus to focus on the factors contributing to the changes in PSM among middle school students.

Schools and families are two essential places in which adolescents develop PSM. Since policy interventions taking place in a family context may not be feasible or entirely desirable, concerted and coordinated efforts must be put into the improvement, if not an overhaul, of the K-12 educational system. Our empirical results reveal that adolescents have a significantly higher PSM when they interact with transformational and friendly teachers. Teachers must then learn to be more democratic and engaging in pedagogical approaches. For school principals, the recruitment of loveable, patient, and earnest teachers stands out as a central task. Policymakers should also be cognizant of the long-term benefits of providing special training for teachers to hone their interpersonal and leadership skills that are conducive to the enhancement of students' PSM and their subsequent willingness to dedicate themselves to public service.

A broader practical implication of this study is that it validates the positive spill-over effects of education from the perspective of social equality. In the absence of any policy interventions, the inequality in the development of cognitive ability, interpersonal skills, and prosocial values during the early childhood phase persists and worsens over time among adolescents from families with vastly different socioeconomic status (Lichter et al., 2002; Walker et al., 2011). The empirical support given to our first two hypotheses squares with this grim truth to some degree. Fortunately, our subsequent findings show that approachable and caring teachers can offset the undesirable impact of lousy or aloof parenting on adolescents' prosociality. The discrepancy in PSM values among adolescents caused by the original family can be viably narrowed by quality education, strengthening policymakers' confidence in easing social inequality through refined human resource management in the school context. Considering that PSM is associated with individuals' sector preferences (Holt, 2018), reducing the gap in PSM levels among different social groups from the get-go also serves as a visionary strategy to augment employee diversity and performance in public bureaucracies.

Limitations and future directions

This study inevitably suffers from limitations that future research should address. First, we used PSM-adjacent questions from an existing questionnaire rather than the exact items from well-established scales, to measure PSM. As suggested by scholars

such as Holt (2019) and Kim (2021), PSM should be better understood as a formative construct consisting of several divergent dimensions (Kim, 2011; Resh et al., 2018, 2019). Thus, utilizing abbreviated measures may shoulder the risk of reducing the theoretical validity of the PSM construct. Further improvements can be made by investigating the relationship between family and school socialization antecedents and PSM measured with a well-recognized scale.

Second, while the variability in PSM explained by empirical models is consistently low in existing literature (e.g., Vandenabeele, 2011), the relatively small explanatory power yielded by our study still reflects the fact that many important covariates, such as peer influence, school attributes, and even broader cultural factors, may not be well considered and controlled for. In fact, the impact from peers, traditions, and culture are equally important as parents and teachers in socializing adolescents' PSM (Kim, 2021). This indicates that greater attention should be given to exploring how informal or intangible institutions shape individuals' PSM. It is also worth noting that such differences may not be solely attributable to socialization effects but rather rooted in biology. One recent article points out that women are more likely to exhibit PSM values than men (Riccucci, 2018). It is thus possible that biological or even genetic factors are an important source for it and have assigned an 'initial' PSM score for each individual. We thus encourage emerging public administration scholars to embrace multidisciplinary collaborations, particularly with like-minded peers from neuroscience, biology, and genetics, to elucidate how biological and socialization factors jointly interact to shape PSM.

Third, our sample consists of Chinese teenagers from a background of strong Confucian traditions in which families play a dominant and influential role in their socialization trajectory. For instance, we found that parental regulation exerts positive socialization effects on adolescents' PSM. This finding, however, is unlikely to hold in a culture of individualism, where children view parental regulation as a constraint on autonomy and competence (Hofstede, 1980). Moreover, as stated previously, the education system and cultural expectations for the teacher-student relationship differ among countries. Students in China are often told to obey whatever teachers say or ask them to do. The high, if not blind, obedience among Chinese adolescents to their teachers suggests that socialization effects stemming from school education are stronger in China than in other countries where teachers' authority is comparatively low and constantly challenged (Lau et al., 2000; Lewis et al., 2005). Accordingly, greater effort is needed to assess whether our findings can be generalized to other contexts with different cultural, educational, and social systems.

Lastly, we must be cautious about making causal claims about the effects of various relationships on the cultivation of adolescents' PSM. Namely, the possibility of reverse causality cannot be entirely ruled out. For instance, it is likely that adolescents with higher 'initial' levels of PSM would be more sociable and more apt to interact with teachers and parents, thus developing a good relationship with them. However, the lack of baseline PSM data prevents us from understanding the direction of the relationship between PSM and parental and school socialization factors. Additional studies utilizing more symmetrical data and more appropriate methods are needed to clarify the causal dimension of this relationship.

In conclusion, this article extends the current understanding of the antecedents of PSM and provides fresh insights into how family and school socialization agents interact to shape adolescents' PSM. Given that the existing literature has tangentially addressed the sources of PSM at the pre-entry level, we believe that this study has the potential to enrich its theoretical development. Pragmatically speaking, this line of work will also aid decision-makers in formulating well-informed educational policies capable of incubating virtuous citizens and public servants of future generations.

Notes

1. It should be noted that there are fundamental differences between parental and organizational regulations, as the former are much more conducive to the enhancement of one's intrinsic motivation. More specifically, the literature in organization studies suggests that workplace and procedural regulations are often perceived as being at odds with work autonomy and are consequently associated with declining levels of PSM among frontline workers (Jensen et al., 2020; Moynihan & Pandey, 2007). Contrary to the regulations in organizational settings, parental ones are protective in nature and have positive implications for the PSM of offspring.

2. The student questionnaire contains a wide range of topics, including demographic characteristics, childhood experience, parent-child relationships, career expectations, and social values. The parent, teacher, and school administrator surveys cover subjects pertaining to the family and school contexts in socializing teenagers. More details can be found online: http://ceps.ruc.edu.cn/English/Home.htm

3. Although the CEPS included 10,279 students in the first wave, it tracked only 9,449 students in its second wave. Thus, those with missing information in either wave were dropped (n= 830). In addition, following the methods of previous studies (Holt, 2019; Kim, 2021), we utilized the listwise deletion strategy to drop cases at both the individual (n= 2,711) and classroom levels (n= 639).

4. Scholars have proven that the abbreviated measure of PSM-related values is comparable to the well-established multi-dimensional measure of PSM (Holt, 2019; Kim, 2021). Specifically, the items used in this study to construct the PSM-related values are indeed parallel to the established PSM index. The first and second items – *'I am willing to help elderly people'* and *'Have you been sincere and friendly with others?'* – utilized to capture the essence of compassion and prosocial values, are equivalent to items in existing PSM measurement scales, such as *'Considering the welfare of others is very important'*. (Kim et al., 2013). The third item, *'Have you been able to keep order and line up consciously?'* represents a critical civic virtue which echoes elements of Vandenabeele's study (2008) in which he incorporated the bureaucratic and civic values into the existing PSM measurement scale., such as *'If there are clear rules, one should not deviate from them'*.

5. Existing studies suggest that the interpretation of Cronbach's alpha must also consider the number of items being used to measure an underlying construct (Cortina, 1993; Leowenthal, 2001). For example, Leowenthal (2001) found that an alpha value of 0.6 is acceptable for a scale with less than four items. Thus, the alpha value of our three-item PSM construct (0.66) is more than sufficient. In addition, the reliability of our PSM-related value index is comparable to previous studies in which researchers have used a secondary dataset to develop the abbreviated measure of PSM (Holt, 2018). To err on the side of caution, we also conducted an additional regression analysis. The results suggested that the construct of PSM-related values is significantly associated with adolescents' preference for government work, indicating that this index does capture the heart of PSM.

6. The intra-class correlation coefficient (ICC), a common indicator to assess whether the HLM is needed, is calculated as the between-group variance divided by the total of variance components. The ICC value ranges from −1 to 1. When the ICC value is greater than 0, it suggests that there is an association among subjects within the same level and hence justifies the appropriateness of using the HLM.

7. While management and public administration scholars have established various measures for transformational leadership (e.g., Podsakoff et al., 1996; Wright & Pandey, 2010), these may not be well suited in a classroom context, as they fail to identify relevant transformational behaviours associated with teachers. To overcome these shortcomings, Bolkan and Goodboy (2010) created a behavioural measure of transformational leadership in the school context.

Data Availability

The data that support the findings of this study are publicly available in National Survey Research Center at the Renmin University of China (http://ceps.ruc.edu.cn/English/Home.htm).

Disclosure statement

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Appendices

Appendix A: Model Specifications

Model 1 (null model):
  Level 1: Student

$$PSM_{ij} = \beta_{0j} + r_{ij}$$

  Level 2: Classroom

$$\beta_{0j} = \gamma_{00} + \mu_{0j}$$

Model 2 (random-coefficient model):
  Level 1: Student

$$\begin{aligned}PSM_{ij} = &\ \beta_{0j} + \beta_{1j}(parent - child\ relationship) + \beta_{2j}(parental\ regulation) \\ &+ \beta_{3j}(academic\ performace) + \beta_{4j}(Parents'\ occupation) + \beta_{5j}(Parents'\ highest\ education) \\ &+ \beta_{6j}(gender) + \beta_{7j}(ethnicity) + \beta_{8j}(age) + r_{ij}\end{aligned}$$

  Level 2: Classroom

$$\beta_{0j} = \gamma_{00} + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

$$\beta_{5j} = \gamma_{50}$$

$$\beta_{6j} = \gamma_{60}$$

$$\beta_{7j} = \gamma_{70}$$

$$\beta_{8j} = \gamma_{80}$$

Model 3 (intercepts-as-outcomes model):
  Level 1: Student

$$PSM_{ij} = \beta_{0j} + \beta_{1j}(academic\ performace) + \beta_{2j}(Parents'\ occupation)$$
$$+ +\beta_{3j}(Parents'\ highest\ education) + \beta_{4j}(gender) + \beta_{5j}(ethnicity) + \beta_{6j}(age) + r_{ij}$$

Level 2: Classroom

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(echer - student\ relationship) + \gamma_{02}(Teachers'\ transformational\ leadership)$$
$$+ \gamma_{03}(Teachers'\ teaching\ values) + \gamma_{04}(Teachers'\ job\ satisfaction) + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10} + \mu_{1j}$$

$$\beta_{2j} = \gamma_{20} + \mu_{2j}$$

$$\beta_{3j} = \gamma_{30} + \mu_{3j}$$

$$\beta_{4j} = \gamma_{40} + \mu_{4j}$$

$$\beta_{5j} = \gamma_{50} + \mu_{5j}$$

$$\beta_{6j} = \gamma_{60} + \mu_{6j}$$

Appendix B: Survey Questions

PSM

(1) I am willing to help elderly people.
(2) Have you been sincere and friendly with others?
(3) Have you been able to keep order and line up consciously?

Parent-child relationship

(1) How often do you discuss the things happening at school with your parents?
(2) How do you view the relationship between you and your parents?
(3) How often do you and your parents do the readings together?
(4) How often do you play sports with your parents?
(5) How often do you visit museums, zoos, and science museums with your parents?
(6) How often do you go out to watch movies, shows, and sports with your parents?

Parental regulation

(1) Are your parents strict with you about homework and exams?
(2) Are your parents strict about your school performance?
(3) Are your parents strict about when you go to school every day?
(4) My parents set limits for the time I come home every day.
(5) My parents set limits for those I make friends with.
(6) Are your parents strict about how you dress?
(7) My parents set limits for the time I spend on surfing the internet.
(8) My parents set limits for the time I spend on TV.

Teacher-student relationship

(1) My head teacher always praises me.
(2) My head teacher always criticizes me. (reversed coding)
(3) My head teacher always asks me to answer questions in class.

Transformational leadership

(1) Are you satisfied with the students in your class?
(2) On the whole, do the students in this class respect you?
(3) Do you use interactive teaching methods in your class?
(4) Do you use group discussions as a teaching method in your class?
(5) Would you encourage students with poor performance to continue their studies after graduating from middle school?

Appendix C: Cross-Level Interaction between Parental Regulation and Teacher's Transformational Leadership for PSM-Related Values