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**Multidimensional Profiles of Parent Involvement: Antecedents and Impact on Student Engagement**

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### Abstract

**Background.** Parent involvement in school is a consistent predictor of educational success. However, research has been inconsistent in addressing how parent involvement ought to be defined and measured, which has led to varied findings across schools and educational systems.

**Aims.** Attending to the multidimensionality of the construct, this study adopted a person-centred approach to identify subpopulations of school-based parent involvement. Subsequently, profile differences were investigated in relation to student engagement and three antecedent variables (gender, socio-economic status, and authoritative parenting). **Sample.** Data were obtained from primary (10-year old; N = 4,284) and secondary (14-year old; N = 3,346) school students in Singapore.

**Methods.** Latent profile analysis was conducted on student-rated surveys of multiple parent involvement behaviours in school and their perceptions. Subsequently, the manual BCH method was employed to concurrently model covariates and outcomes on the latent profile model. Pairwise comparisons between profiles were examined for statistical significance.

**Results.** Consistent across both cohorts, four distinct profiles emerged that revealed high, moderate, selective, and low parent involvement patterns. High parent involvement reflected high ratings across multiple activities, combined with positive perceptions of parental involvement. These profiles differed significantly in terms of their antecedent characteristics, particularly, authoritative parenting, and in relation to their impact on student engagement.

**Conclusion.** Results from this study clarify relations between multi-faceted dimensions of parent involvement in school. Additionally, there is a case for continued school-family partnerships among secondary students as students remain academically engaged when parents are involved in school and students relate positively to their involvement.

Decades of research have shown that active parent involvement in school is a consistent predictor of educational success (Fan & Williams, 2010; Hill et al., 2004; Jeynes, 2011; Reschly & Christenson, 2009; Wang & Sheikh-Khalil, 2014). However, research has been inconsistent in addressing how parent involvement ought to be defined and measured, which has led to varied findings across schools and educational systems (Huntsinger & Jose, 2009; OECD, 2019; Wilder, 2014). As the construct of parent involvement is inherently multidimensional, researchers often emphasise the need to consider the types of parent involvement behaviors (Boonk et al., 2018; Epstein, 2010; Jeynes, 2012) and the socio-cultural forces at play (Kohl et al., 2000). It may also be the case that past research has been heavily focused in Western contexts, only with some recent exceptions (see Kim, 2020 for a meta-analytic review). The current study contributes to the empirical literature by testing a multidimensional conception of parent involvement among two large student cohorts in Singapore, a high-performing East Asian educational context where even fewer studies have been conducted on the involvement of parents in students' school life, the factors that influence involvement and the consequent impact on student outcomes.

Adopting a person-centered approach, this study aimed to identify subpopulations of school-based parent involvement through a simultaneous examination of multifaceted indicators, an area of research that is largely underexplored. Considering the multiple dimensions of parent involvement simultaneously can account for sample heterogeneity and deepen our understanding of the unique configurations of parent involvement profiles and which ones are beneficial. Subsequently, we investigated the links between these profiles and the outcome of student engagement, while accounting for three important antecedents (gender, socio-economic status and authoritative parenting).

## **Parent involvement at school**

Parent involvement is a broad construct that reflects the range of parental activities at home and in school that contribute to students' school-related outcomes. Many studies however have focused on school-based involvement for its sustained impact on academic success and implications for school improvement (Fan & Chen, 2001; Jeynes, 2012, 2018). As such, the focus of parent involvement in this study is situated within the school context.

Parent involvement at school entails targeted activities that increase parents' familiarity of the school curriculum, promote social capital and social networking amongst parents, foster community spirit and enhance the effectiveness of home-based learning (Hill & Tyson, 2009; Ho & Willms, 1996; Park, Stone, & Holloway, 2017; Wilder et al., 2014). While different forms of involvement activities are used variedly to promote school-family partnership, parent-teaching meetings are among the most common, along with high rates of participation. These regularly scheduled school-organised meetings provide an important avenue for parents to have access to school leaders and to be updated on important curricula matters that to some extent make schools accountable to parents (Power & Clark, 2000). Other common forms of involvement include informal teacher-parent communication on child's learning progress, parenting volunteering or participating in school governance (Lee & Bowen, 2006; Epstein, 2010).

Although parent involvement at school may decline as students enter secondary school (Hill & Taylor, 2004; Wang & Sheikh-Khalil, 2014), longitudinal studies reveal that students continue to excel when parents are involved. Following up on a large sample of American youths eight years after high school graduation, Benner et al. (2016) found that school-based parent involvement predicted higher educational attainment after controlling for a host of relevant background characteristics, including parent home-involvement. More importantly, results that school-based involvement is less sensitive to socio-cultural

reproduction mechanisms is a promising finding that highlights the long reach of active parent school involvement. This is especially reassuring for schools facing equity challenges as attendance at parent-teacher meetings, for example, do not typically require parents to possess specialized skills to participate efficaciously.

However, studies have also found that simply involving parents in discrete school-based activities may not automatically produce the types of schooling outcomes desired by parents and policymakers (Lareau, 2011; Robinson & Harris, 2014). Rather, holistic improvements in students' outcomes are reflected in multiple involvement behaviours (Alameda-Lawson & Lawson, 2018; Epstein, 1995; Fan & Chen, 2001). For example, regular communication with teachers on child's progress, participating in parent-child activities to foster bonding and connection with the school and parental assistance with homework are among the common forms of parent involvement that contribute cumulatively to improved schooling outcomes. Yet, efficacy of parent involvement varies from one context to another (Huntsinger & Jose, 2009; Wilder, 2014). For instance, among Asian families, time-involved school-based involvement (e.g., volunteering, attending school-organized activities) has been found to predict achievement negatively, while the reverse is true for communication-focused involvement (i.e., attending parent-teacher meetings, checking with teachers on children's progress) (Mau, 1997; Stright & Yeo, 2014). The reduced impact of the former may be confounded by culture-specific factors as Asian parents usually prefer home-based support to school-based involvement (Huntsinger & Jose, 2009). Furthermore, East Asian societies typically do not have a strong tradition of participating in unconditional parent volunteer or school governance programs (Stright & Yeo, 2014), with most preferring to defer such matters to school authorities (Kim, 2020; Li et al., 2011). These trends may not be unique to Asia however as recent studies have reported on the negligible influence of parent involvement in school governance and volunteering, but not school/teacher-initiated

communication (Jeynes, 2018; OECD, 2019). Therefore, despite widespread agreement that parent school involvement benefits students academically, unresolved issues remain as not all involvement indicators lead to positive outcomes (Hill & Tyson, 2009; Jeynes, 2018).

School-based parent volunteering and decision making do not always benefit academic outcomes yet remains integrated within the theoretical construct that guides most parent involvement research (Robinson & Harris, 2014). It is also common to find studies that have employed narrow measures of parent involvement (e.g., school-initiated contact with parents; Fan & Williams, 2010) that may not relate to the multidimensional nature of the construct.

Considering the diverse evidence, there is a need to attend to the complexity of how different indicators fit into the broader conception of parent involvement at school (Fan & Chen, 2001; Grolnick & Slowiaczek, 1994; Kohl et al., 2000; Manz, Fantuzzo, & Power, 2004) and the varying associations that emerge from different behaviours (Boonk et al., 2018; Hill & Tyson, 2009). While most measures focus on parental participation in various involvement activities, another equally important construct is students' internalization of the benefits of parent involvement (Marchant et al., 2001). The extent to which parental involvement is viewed positively by students has comparable if not more impact on schooling outcomes than involvement behaviours alone (Keith, 1991). This suggests that students with involved parents are more likely to experience positive outcomes if the perceived involvement is also viewed favourably by students. By contrast, high parental involvement may not always be beneficial if students do not relate well to them, for example, academic burnout has been associated with overly involved parents (Schiffrin et al., 2015). Therefore, for parent involvement to have an impact, both behaviours and beliefs must be heading in the same direction. To resolve this empirical quandary, the present study adopts a person-centred approach that is better suited for investigating the naturally occurring combinations of different school involvement practices and beliefs. As such, the findings would be

particularly helpful in expanding current operationalizations of parent involvement at school and the plausibility that there may be different configurations of the construct and that these configurations vary in their characteristics and impact.

### **Antecedents of parent involvement**

It is often believed that high SES (socio-economic status) parents feel more efficacious in supporting their children's education over low SES parents who face greater barriers to participation (e.g., Alameda-Lawson & Lawson, 2018; Borgonovi & Montt, 2012; Kohl et al., 2000). But mixed evidence has been reported in which Tan (2019) found the absence of a definitive relationship between SES parents and their involvement behaviours; high SES parents were selective and were not always more involved. Therefore, effects of family SES on parent involvement continue to attract significant interest as is in this study.

Gender and parenting style are another set of key antecedents. Research on gender is not extensive with most reporting non-significant differences in school-based parent involvement (Borgonovi & Montt, 2012; Ogg & Anthony, 2019; Wilder, 2014). Where differences exist, parents of boys are more involved due in large part to higher prevalence of academic and behavioural concerns in school (Garbacz et al., 2015; Manz et al., 2004).

Parenting styles at home contribute to successful school-family partnerships, yielding the second highest effect size in meta-analysis (Jeynes, 2018). Among various models, authoritative parenting is viewed as the most likely to produce the best outcomes for children and adolescents (Ulferts, 2020; Xia, 2020), which include higher academic competence, stronger learning engagement and fewer disruptive behaviours (Jeynes, 2007; Lamborn et al., 1991). Authoritative parents are firm and warm, take the time to reason with children on strict rules, praise children for their efforts and support their child's need for psychological autonomy. Steinberg et al. (1992) found that the positive effects of parent involvement on



adolescent schooling success often occurred in the context of an authoritative family climate, thus, extending its importance as an antecedent variable (Darling & Steinberg, 1993).

### **Parent involvement and student engagement**

In recent years, there has been a growing awareness that parent involvement exerts a greater direct influence on proximal outcomes (Boonk et al., 2018; Grolnick & Slowiaczek, 1994; Steinberg et al., 1992). As Hoover-Dempsey et al. (2010) explain, outcomes that focus on learning-related attributes are prime targets in parent involvement research as “they are subject to parental influence and are closely linked to students’ performance on distal, summary measures of school achievement” (p. 35). Among various types of learning attributes, success at school generally requires active student engagement (Lawson & Lawson, 2013; Skinner et al., 2008). Engaged students possess a range of cognitive, affective and behavioural attributes that enable them to persevere in their learning and succeed in school. Therefore, a considerable body of research considers student engagement an important schooling outcome that is amenable to intervention and impacted by contexts (Christenson, Reschly, & Wylie, 2012; Fredricks et al., 2004).

Although parent involvement and student engagement are positive related, reported effects have been small (Steinberg et al., 1992). For example, Fan and Williams (2010) reported a standardized estimate of 0.03. One attributing reason could be the use of inappropriate methodology that ignores the multidimensional structure of student engagement. In this study, we attend to calls for more methodologically appropriate treatment of this construct (Betts, 2012; Fredricks & McColskey, 2012).

### **Present study**

Although research on parent involvement and their impact is well-studied, relatively few researchers have explored this topic using a person-centred approach that considers its multifaceted nature (i.e., the extent to which families vary in their patterns of involvement

behaviours at school). Further, while some evidence suggests that parent involvement declines after primary school (e.g., Hill & Taylor, 2004), it is not clear how patterns of involvement behaviours differ between parents of primary and secondary students. The present study attends to these gaps by analysing patterns of parent involvement at school as perceived by primary and secondary school students in Singapore. The context of this study is compelling given the dearth of studies but also because policymakers have been articulating the importance of parent involvement where every parent is regarded as a supportive partner, working collaboratively with the school to bring out the best in students (Heng, 2012).

Three questions guided this study. First, what parent involvement profiles are prevalent as reported by 10- and 14-year old students in Singapore? Second, to what extent do these profiles differ by gender, family socio-economic status and authoritative parenting? Third, do differences in parent involvement profiles predict student engagement?

## **Method**

### **Sample and design**

Formal education in Singapore starts with six years in primary school (7-12 years) and four years in secondary school (13-16 years). This study targeted Primary Four (Pri4) and Secondary Two (Sec2) as these levels reflect important educational midpoints of active parent-child and parent-teacher engagements on academic and co-curricular activities.

The sampling design involved a multi-stage approach. To enhance the empirical rigor of the sample, the proportion of graduate mothers for each school was used to systematically stratify schools into low, moderate and high, followed by a random selection of schools from each stratum. Parental education was selected as a stratification variable based on its consistent association with better schooling outcomes (Lundborg et al., 2014) and parent involvement (Kohl et al., 2000), while mother's education was guided by extensive research

on the substantive contribution of maternal education (e.g., Lundborg et al., 2014).

Approximately 10% of schools were selected from the total population of 185 Primary and 150 Secondary schools. Within each school, all Pri4 and Sec2 students were included. Our final sample comprised 4284 Primary Four (Pri4) and 3346 Secondary Two (Sec2) students across 22 Primary and 15 Secondary schools. Ethics approval was granted by the University and all students agreed to their participation.

## Measures

**Student-rated measures of parent involvement.** Existing concepts and instruments (e.g., Epstein, 1995; 2010; Kohl et al., 2000) were reviewed to develop two student-rated constructs of school-based parent involvement. The first construct, *Parent involvement at school*, consisted of five items on a five-point, “almost never” to “very often”, scale where students reported the frequency of their parents’ involvement in school. Sample items were: “My parents... discuss my learning progress with teachers; attend parent-teacher meetings; volunteer in my school” (see notes to Table 1 for full items). The second construct, *positive perceptions of parent involvement*, consisted of five items on a five-point agreement scale. Sample items were: “I would like my parents to be present in parent-teacher meeting”, “I am proud to see my parents volunteer in school”, “My parents will understand me better if they are more involved in my school”. Both constructs were assessed by student ratings as parents tend to overstate their involvement (e.g., DePlanty, Coulter-Kern, & Duchane, 2007) and children generally provide more accurate ratings of parental behaviors (e.g., Skinner et al., 2005). All items were analysed as individual indicators of the latent profile model as their contents reflect discrete and varied behaviours of parent involvement.

**Student engagement.** This multidimensional construct comprised 16 items adapted from past studies of which six items assessed *cognitive* (e.g., “I monitor my learning by asking myself questions about the topic”; Meece et al., 1988); seven items assessed *affective*

(e.g., “I am proud to be part of this school”; Goodenow, 1993) and three assessed *behavioral* (e.g., “I keep my attention on the work during the entire lesson”; Steinberg et al., 1992). As conventional hierarchical factor models impose strict restrictions on item cross-loadings, they are not appropriate for assessing multidimensional constructs where items are expected to covary to some small extent (Betts, 2012). Following the recommendations of Marsh et al., (2014), the ESEM-within-CFA (EwC) procedure was implemented. The EwC adopts a hierarchical exploratory structural equation model (ESEM) that accommodates the coexistence of both the hierarchical factor (i.e., student engagement) and the specific (i.e., cognitive, affective and behavioural) subfactors, and subsequently reexpressing it as a parsimonious confirmatory factor analysis (CFA) model. Model fit statistics for the EwC were satisfactory across both cohorts. Pri4: ( $\chi^2[df] = 192.7 [73], p < .05$ ; CFI/TLI=993/988; RMSEA (90% CI) = .020 (.016-.023); SRMR=.012; and Sec2: ( $\chi^2[df] = 359.1 [72], p < .05$ ; CFI/TLI=986/977; RMSEA (90% CI) = .035 (.031-.038); SRMR=.014. Subsequently, hierarchical EwC factor scores were saved for further analysis in the final mixture regression model. Factor scores derived from multidimensional models are more robust as they consider the measurement structure of and the errors among the item-to-factor relations.

**Gender.** 49% (Pri4) and 48% (Sec2) were female.

**Authoritative parenting.** Seven items were adapted from the authoritative parenting domain of the Parental Authority Questionnaire (Buri, 1991) and assessed on a 5-point agreement continuum. Sample items include “My parents tell me how I should act and explains to me the reasons why”, “My parents always tell me to discuss with them whenever I feel that family rules are too strict”. Model fit statistics indicated a good fitting model ( $\chi^2[df] = 100.5[12], p < .05$ ; CFI/TLI=985/974; RMSEA (90% CI) = .042 (.035-.050); SRMR=.021. Construct reliability ( $\omega^2$ ) was .831.

**Family socio-economic status (SES).** Residence type (subsidized *public* and non-subsidized *private* housing) was used as a proxy binary indicator for family SES. Although residence type may underestimate the true effect of SES, it remains a strong indicator of social class and social capital differences in Singapore. For Pri4, 73% resided in public housing, while 80% of Sec2 did so. These distributional profiles are very close to national census estimates.

### **Analytical Approach**

Model selection follows a class enumeration procedure where incremental latent profile models are evaluated in ascending order. The best fitting model (i.e., optimal number of profiles) is identified by evaluating key information criteria that include the Akaike Information Criteria (AIC), adjusted Bayesian Information Criteria (BIC), entropy and Vuong-Lo-Mendel-Rubin (VLMR) likelihood ratio test. Lower values indicate better fit and higher entropy (>0.8) indicates better classification accuracy. VLMR provides a significance test that compares the gain in model fit with each additional profile. As information criteria often favour complex models in the presence of large samples and indicators, substantive contributions and interpretability are important considerations (Morin et al., 2011).

After determining the best fitting model, the analysis was extended to a multinomial regression where differences in covariate antecedents (gender, SES and authoritative parenting) and the proximal outcome (student engagement) were investigated concurrently within the same model using the manual BCH method (Bakk & Vermunt, 2016). This method uses a weighted multiple group analysis which has the advantage of controlling for measurement errors in profile assignment and preventing unintended profile shifting when external variables are included (Nylund-Gibson et al., 2019). Profile differences in the outcome were assessed by significance tests of pairwise mean comparisons. Standardized effect sizes (Cohen's *d*) were computed to aid interpretation (see notes to Table 3).

## Results

Table 1 reports the descriptive statistics which shows lower involvement among Sec2 parents except school-organised activities (parenting-teacher meetings, discussion with teachers and attending talks). Table 2 reports the fit statistics for one to six latent profile solutions. Decreasing values in the informational criteria indicate improving model fit, with the best model being the point at which the values level off. Consistent across both cohorts, the information criteria and VLMR values appear to level off after the fourth profile. Although a six-profile model was a possible consideration, there was limited contribution. For Pri4, the gain in model fit was very marginal, whereas for Sec2, inspection of the additional profiles were merely small variations of previous solutions, thus lacking substantive interpretable contributions.

Figure 1 shows the profile plot for the four-profile model which were relatively similar for both Pri4 and Sec2. The first profile reflects active parent involvement across multiple school-based activities and positive perceptions of parental involvement by students. The first profile was thus labelled *high involvement* (12% for Pri4 and 7% for Sec2). The second profile was *moderate involvement* (44% and 49%, respectively) as it reflects average ratings across most indicators. However, some distinct differences could be observed. Among Pri4, attendance at parent-teaching meetings was most dominant ( $M=3.66$ ), compared to Sec2 ( $M=3.05$ ). By contrast, parents discussing learning progress with teachers was more prominent among Sec2 ( $M=3.77$ ), compared to Pri4 ( $M=2.79$ ). The third profile, *selective involvement* (20% and 11%, respectively), reflects high participation in parent-teaching meetings (Pri4) and parents discussing learning progress with the teacher (Sec2) but substantially lower participation in other activities, particularly, parent volunteering. Students' perceptions of parental involvement were moderate. The fourth profile, *low*

involvement, reflects low parent involvement and low positive student perceptions (24% and 33%, respectively).

Table 3 (a) reports the multinomial regression of covariate variables on profile differences. Overall, parents of boys and girls were equally involved at higher levels of involvement (*high* and *moderate*) but larger differences were observed at lower levels of involvement (*selective* and *low*). Parents of girls were less likely to be associated with *high* involvement, compared to *selective* ( $OR=.69$  and  $.41$ , respectively for Pri4 and Sec2). Specifically, parents of girls were 31% (Pri4) and 59% (Sec2) less likely to be associated as *high* involvement. Similarly, parents of girls were less likely to be associated with *moderate*, compared to *selective* involvement ( $OR=.65$  and  $.46$ , respectively for Pri4 and Sec2). However, parents of girls were 1.8 (Pri4) and 2.4 (Sec2) times more likely to be associated with *selective* than *low* involvement.

Higher family SES (private housing) did not differ significantly across all pairwise profile comparisons, with the only exception between *selective* and *low* involvement, among Sec2 only. Sec2 students who resided in private housing were 1.57 times (inverse of  $OR=.64$ ) more likely to be associated with *low* involvement.

Authoritative parenting strongly predicted profile differences favouring higher involvement. The largest effect was between *high* and *low* involvement ( $OR=6.6$  for Pri4 and  $5.3$  for Sec2). Similarly, compared to *low*, *moderate* and *selective* involvement were associated with higher authoritative parenting. But this was true only for Pri4. For Sec2, those in *low* involvement were associated with higher authoritative parenting.

Table 3 (b) shows the latent pairwise mean comparisons, with results supportive of a positive association between parent involvement and student engagement. Controlling for the three covariates, the largest difference was between *high* and *low* profiles ( $M_{diff}=.511$  [ $d=.915$ ] and  $.400$  [ $d=.575$ ], respectively for Pri4 and Sec2). Differences between *moderate*

and *selective* involvement were trivial. On the other hand, students in *low* involvement were most at risk of being academically disengaged.

As the manual BCH method allows the concurrent estimation of covariates and outcomes while also accounting for their direct relationships, results of the covariate effects on student engagement are reported in Table 3 (c). Among Pri4, boys ( $B=.124, p<.01$ ) and higher authoritative parenting ( $B=.345, p<.01$ ) predicted student engagement. Among Sec2, gender did not influence student engagement. But students who resided in public housing ( $B=-.165, p<.01$ ) and whose parents practiced authoritative parenting ( $B=.278, p<.01$ ) were more academically engaged.

## Discussion

Four distinct profiles emerged that were broadly consistent across both student cohorts, thus indicating that parent involvement at school is multifaceted in nature. *Selective* involvement emerged as the most dominant profile (44% and 49%), characterized by high involvement in selected activities; mainly parent-teacher meetings (for Pri4) and communicating with teachers on child's progress (for Sec2). This was followed by *low* involvement (24%; 33%), *moderate* involvement (20%; 11%) and *high* involvement (12%; 7%). The *moderate* profile differed from *selective* in terms of parent volunteering and to some extent coordinating activities in school. *Low* involvement reflected low ratings across all indicators, including perceptions of parental involvement.

Overall, results from this study revealed distinct profiles with varying cross-over characteristics of parent involvement (i.e., high ratings in some items and low in others). Antecedent predictors contributed to profile differences, especially gender and authoritative parenting. Involvement profiles showed a positive linear association with student engagement.



### **Antecedents of parent involvement profiles**

Pairwise comparisons of parent involvement profiles differed across gender and authoritative parenting. Despite robust relationships between SES and parent involvement (Grolnick & Slowiaczek, 1994; Ho, 2006; Kohl et al., 2000), our results leaned towards recent evidence that high SES families are not necessarily more involved (Tan, 2019). Elsewhere, parental involvement practices have also been found to differ across North American, England and other Nordic working-class families (e.g., Hegna & Smette, 2017). The myriad evidence suggests that the relationship between SES and parent involvement is invariably complex and there is a need to consider the wider socio-cultural context.

Existing literature indicates that parent involvement in relation to child's gender is largely negligible (Borgonovi & Montt, 2012; Wilder, 2014), but some studies have found stronger involvement among parents of boys due to more prevalent academic and behavioural concerns (e.g., Garbacz et al., 2015; Manz et al., 2004). Results in this study provided mixed support with negligible differences between profiles at higher levels of involvement but larger differences at lower levels. While parents of girls were less likely to be in the *moderate* profile (compared to *selective*), they were also however more likely to be in the *selective* profile than *low*, compared to boys. As *low* involvement is characterised by low positive regard for parental involvement, this finding may align to the phenomenon that boys generally desire more independence and hence tended not to want their parents to be involved in school. It was also plausible that boys associated with this profile were not progressing well in school which contributed to their low regard for parent involvement. Indeed, as subsequent results show, students in *low* involvement reported significantly lower student engagement thus suggesting that educators pay more attention to this profile.

Extensive evidence that authoritative parenting positively impacts parent involvement and student outcomes bear out in this study. Although some literature have indicated that

parenting behaviours may have reduced impact on high school adolescents (e.g., Steinberg & Silk, 2002), the comparably strong relationship for the Sec2 cohort underscores the continued contribution of authoritative parenting for enhancing school-family partnership (Jeynes, 2018). Sec2 students associated with *high* and *low* involvement profiles were more likely to report higher exposure to authoritative parenting practices. While the latter result was at first intriguing and contrast with past research (e.g., Steinberg et al., 1992), a plausible explanation can be attributed to the subtle effects of home-based authoritative parenting that can co-occur in the absence of active school involvement, particularly among older students (Jeynes, 2007). If this was true, students associated with the low involvement profile should not differ with other groups on levels of student engagement – a view proposed by some (e.g., Desforges & Abouchaar, 2003) that “good” parenting practices may have an equally robust influence on outcomes, even in the absence of active school involvement. For instance, past studies in Singapore found that adolescents who were exposed to authoritative parenting showed a greater interest in schooling (Sim & Chin, 2014). However, as our results show, the academic engagement of students in *low* parent involvement were significantly lower than other profiles, even after controlling for authoritative parenting. Despite the positive association between authoritative parenting and student engagement, parent involvement in school remains crucial for supporting students’ learning outcomes and cannot be completely compensated by parenting processes, as some studies have suggested (e.g., Desforges & Abouchaar, 2003; Hill & Tyson, 2009).

### **Parent involvement and student engagement**

Results on involvement profiles and student engagement are aligned with the literature (e.g., Grolnick & Slowiaczek, 1994; Wang & Sheikh-Khalil, 2014). But unlike the modest effects reported in past research (e.g., Fan & Williams, 2010), those in this study were associated with substantially large effect sizes (average Cohen’s *d* was .50 and .34 for Pri4

and Sec2). One scientific explanation could be the use of a broader set of measures that are psychometrically adjusted to account for the underlying multidimensionality of the construct. With rigorous controls for measurement error, our latent composite outcome was therefore more reliable and demonstrated stronger predictive relations. Another explanation could be attributed to the person-centred approach employed which attended to multidimensionality of parent involvement and provided a certain degree of specificity to the multiple subpopulations that in turn manifested more nuanced configurations of the construct. Nonetheless, effects sizes for the secondary cohort were consistently smaller, which provides some support to existing perspectives on the reduced impact of parent involvement. But low does not equate to no effect.

In line with research on the positive association between parent involvement and student engagement, significant mean differences were found across most paired comparisons (10 out of 12). The largest difference was between *high* and *low* profiles, associated with substantively large effect sizes. Therefore, moderate to high parent involvement in multiple school-based activities combined with positive student' perceptions of parent school involvement generate important educational outcomes for students. The finding that these practices were not impacted by social background differences is also a welcoming conclusion given recent priorities among governments to manage rising educational equality (OECD, 2018).

### **Limitations and future research**

This study is limited by the sole focus on school-based behaviors. Despite its varied contributions, home-based parent involvement remains an important predictor of adolescent conduct, engagement and achievement (Hill et al., 2004; Stright & Yeo, 2014). Recent reviews have also weighed in on the value of studying both school-based and home-based involvement (Jeynes, 2018). Moreover, as Asian parents often lean towards home-based

support (Chao, 2000), omitting these measures provides a partial account of parent involvement and may confound the true effect of family SES (as better educated parents are more likely to provide higher quality home-based support). Relatedly, despite the relevance of housing type as a proxy of SES in the local context, it may well underestimate the true effect of actual SES that comprises amongst others, parental education, socio-cultural resources, and household income. Therefore, future studies could consider an expanded operationalization of the SES construct.

Person-centred approaches in parent involvement research are limited. This approach is advantageous if the objective were to capture in concert the range and intensity of different types of parent involvement and to understand how various patterns of involvement differ across educational factors. Yet, variable-centered analysis remains valuable, for example, in providing critical information about how different involvement indicators uniquely contribute to student outcomes. Therefore, both approaches serve different purposes and emphasize the importance of making clear the aims of the empirical investigation. As classification accuracy and uncertainty can influence the rigor of the profiles extracted and bias inferences, future investigations may wish to adopt the recommended analytical approaches used in this study (Nylund-Gibson et al., 2019).

## **Conclusion**

The present study clarifies relations between multi-faceted dimensions of parent involvement in school and calls for a more appropriate methodological treatment that attends to the multidimensional nature of the construct. Doing so provides a more nuanced understanding of different involvement patterns, of the factors that characterise them and of the outcomes they affect. Although parent involvement may decline beyond primary school, there is a case for continued school-family partnerships as students remain academic engaged when parents are involved in school and students relate positively to their involvement.

Table 1. *Descriptive statistics of parent involvement indicators.*

Sec2 Pri4	1	2	3	4	5	6	7	8	9	10
1		.405	.408	.202	.167	.195	.378	.248	.199	.178
2	.377		.399	.397	.388	.300	.281	.239	.298	.267
3	.282	.311		.345	.331	.266	.243	.276	.253	.222
4	.140	.314	.249		.792	.320	.165	.185	.276	.253
5	.132	.343	.231	.572		.291	.149	.173	.259	.259
6	.192	.232	.184	.220	.469		.536	.517	.669	.588
7	.329	.214	.182	.138	.375	.489		.628	.519	.496
8	.195	.196	.245	.147	.545	.404	.489		.511	.513
9	.171	.231	.177	.286	.456	.366	.404	.383		.637
10	.147	.161	.166	.163	.469	.489	.366	.365	.450	
<i>Pri4</i>	3.55 (1.33)	2.65 (1.17)	2.48 (1.39)	1.99 (1.27)	2.13 (1.34)	3.57 (1.32)	3.72 (1.29)	3.36 (1.30)	3.53 (1.39)	3.57 (1.32)
<i>Sec1</i>	3.57 (1.25)	2.64 (1.10)	2.35 (1.31)	1.56 (1.06)	1.54 (1.03)	2.44 (1.15)	3.10 (1.26)	2.91 (1.20)	2.73 (1.19)	2.68 (1.20)

Note. All values at significant at  $p < .01$ .; 1=Parents attend parent-teacher meetings; 2=Parents discuss learning progress with teachers; 3=Parents attend talks/workshops organized by school; 4=Parents volunteer in school; 5=Parents coordinate activities in school; 6=Like parents to join parent-child activities; 7=Like parents to attend parent-teacher meeting; 8=Like my teachers to inform my parents of how I am doing in school; 9=Proud to see parents volunteer; 10=Parents will understand me better if involved.

Table 2. *Latent profile solutions.*

Profiles	AIC	SABIC	VLMR	Entropy
<i>Pri4 Cohort</i>				
1	128157.230	128220.093	--	--
2	122752.166	122849.603	5427.064*	.773
3	120437.083	120569.094	2337.083*	.778
4	119550.761	119717.346	908.322*	.830
5	118555.214	118756.374	1017.546*	.832
6	117741.004	117976.739	836.210*	.808
<i>Sec2 Cohort</i>				
1	98605.282	98663.554	--	--
2	92101.510	92191.831	6453.265*	.955
3	87948.632	88071.002	4174.878*	.865
4	86340.329	86494.748	1630.303*	.882
5	85251.772	85438.241	1110.557*	.852
6	82639.069	82857.587	721.715*	.873

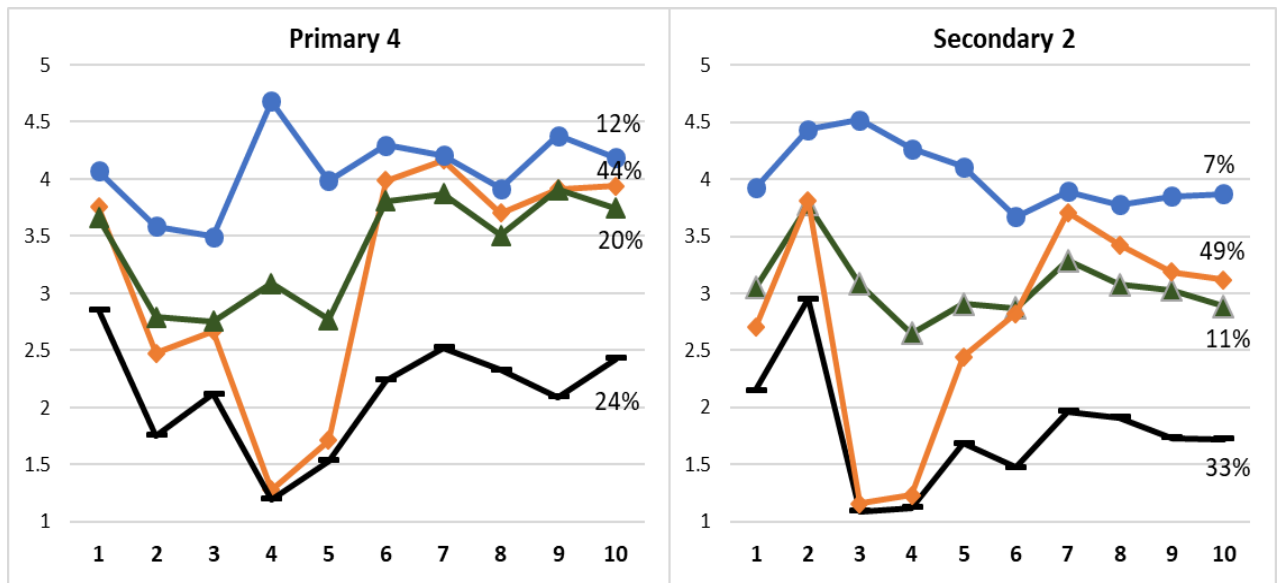
Note. \* $p < .001$ . AIC = Akaike information criteria; SABIC = Sample-size adjusted Bayesian information criterion; VLMR = Vuong-Lo-Mendell-Rubin likelihood ratio test.

Table 3. Results of mixture analysis: a) Covariate predictors on parent involvement profiles and outcome; b) Parent involvement profiles on outcomes

	(a) Covariate Antecedents						(b) Outcome	
	Male <sup>r</sup>		Public <sup>r</sup>		Authoritative Parenting		Student Engagement	
	<i>Est.</i> ( <i>SE</i> )	<i>OR</i>	<i>Est.</i> ( <i>SE</i> )	<i>OR</i>	<i>Est.</i> ( <i>SE</i> )	<i>OR</i>	<i>M</i> <sub>diff</sub> ( <i>SE</i> )	<i>d</i>
<b><i>Profile 1 vs. 2<sup>r</sup></i></b>								
- Pri4	.057 (.141)	1.059	-.106 (.159)	.899	<b>.681**</b> (.133)	1.976	<b>.224**</b> (.037)	.437
- Sec2	-.119 (.199)	.888	.148 (.219)	1.159	<b>.899**</b> (.155)	2.457	<b>.188**</b> (.051)	.347
<b><i>Profile 1 vs. 3<sup>r</sup></i></b>								
- Pri4	<b>-.372**</b> (.120)	.690	-.081 (.136)	.922	<b>.597**</b> (.120)	1.817	<b>.158**</b> (.031)	.316
- Sec2	<b>-.891**</b> (.164)	.410	.454* (.182)	1.575	<b>.682**</b> (.134)	1.978	.080 (.043)	.155
<b><i>Profile 1 vs. 4<sup>r</sup></i></b>								
- Pri4	.216 (.140)	1.241	-.108 (.160)	.898	<b>1.886**</b> (.136)	6.595	<b>.503**</b> (.039)	.915
- Sec2	<b>-.615**</b> (.174)	.514	.445* (.198)	1.560	<b>1.670**</b> (.145)	5.314	<b>.324**</b> (.046)	.575
<b><i>Profile 2 vs. 3<sup>r</sup></i></b>								
- Pri4	<b>-.429**</b> (.102)	.651	.025 (.114)	1.026	-.084 (.082)	.919	.066* (.026)	.133
- Sec2	<b>-.773**</b> (.134)	.462	.306 (.161)	1.358	-.217* (.095)	.805	<b>.131**</b> (.040)	.221
<b><i>Profile 2 vs. 4<sup>r</sup></i></b>								
- Pri4	.158 (.119)	1.172	-.001 (.135)	.999	<b>1.205**</b> (.093)	3.338	<b>.278**</b> (.032)	.510
- Sec2	.119 (.199)	1.126	-.148 (.219)	.863	<b>-.899**</b> (.155)	.407	<b>.135**</b> (.035)	.255
<b><i>Profile 3 vs. 4<sup>r</sup></i></b>								
- Pri4	<b>.588**</b> (.110)	1.800	-.026 (.126)	.974	<b>1.289**</b> (.089)	3.630	<b>.345**</b> (.030)	.645
- Sec2	<b>.891**</b> (.164)	2.439	<b>-.454*</b> (.182)	.635	<b>-.682**</b> (.134)	.506	<b>.243**</b> (.026)	.483
<b><i>(c) Student Engagement</i></b>								
- Pri4	<b>.124**</b> (.017)		.016 (.020)		<b>.340**</b> (.016)			
- Sec2	.042* (.018)		<b>-.135**</b> (.024)		<b>.223**</b> (.015)			

Note. Profile 1=High involvement; Profile 2=Moderate involvement; Profile 3=Selective involvement; Profile 4=Low involvement. \*\* $p<.01$ , \* $p<.05$ ; To aid interpretation, statistically significant ( $p<.01$ ) estimates are boldfaced. <sup>r</sup>=reference category. *OR*=Odds Ratio (>1 indicate higher probability of membership in reference category); *M*<sub>diff</sub>= mean difference; *SE*=standard error; *d*=Cohen's *d* ( $M_{diff}/\sqrt{\text{pooled SD}}$ ) calculated using the Model Constraint command in Mplus with the delta method for obtaining approximate standard errors.

Figure 1. *Response patterns of four profile model*



Note. 1=Parents attend parent-teacher meetings; 2=Parents discuss learning progress with teachers; 3=Parents attend talks/workshops organized by school; 4=Parents volunteer in school; 5=Parents coordinate activities in school; 6=Like parents to join parent-child activities; 7=Like parents to attend parent-teacher meeting; 8= Like my teachers to inform my parents of how I am doing in school; 9=Proud to see parents volunteer; 10=Parents will understand me better if involved.

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## Supplementary for

### Parent Involvement in Singapore: Profiles, Antecedents and Impact on Student Engagement.

- Means and standardized parameters from the ESEM student engagement model
- Mplus syntax for the manual BCH method
  - Step 1: Estimation of BCH weights
  - Step 2: Mixture analysis based on Step 1 including specific tests for pairwise mean comparisons and Cohen's  $d$  effect size.

## Means and standardized parameters from the ESEM student engagement model

	Mean (SD)		Specific Factors						Global Factor	
			<i>Cognitive</i>		<i>Affective</i>		<i>Behavioral</i>			
	Pri4	Sec2	Pri4	Sec2	Pri4	Sec2	Pri4	Sec2	Pri4	Sec2
<b>Cognitive Engagement</b>									.734	.767
When learning something new, I think about what I already know.	3.52 (1.22)	3.57 (.43)	<b>.466</b>	<b>.520</b>	.014	.056	.077	.019		
Before I begin, I set goals for learning (e.g., how long and how I should study).	3.47 (1.87)	3.29 (1.0)	<b>.651</b>	<b>.697</b>	-.009	.011	.043	-.019		
I ask myself how well I've achieved my learning goals once I'm finished.	3.58 (1.64)	3.41 (.92)	<b>.704</b>	<b>.748</b>	.023	.049	-.004	-.062		
I monitor my learning by asking myself questions about the topic.	3.41 (1.68)	3.44 (.86)	<b>.821</b>	<b>.839</b>	-.027	-.015	-.060	-.035		
I go over the points I did not understand in class to make sure I learn them well.	3.65 (1.28)	3.67 (.70)	<b>.668</b>	<b>.640</b>	.003	.014	.061	.101		
I ask myself questions that allow me to reflect on the problem.	3.47 (1.83)	3.45 (.77)	<b>.783</b>	<b>.788</b>	-.006	-.078	-.063	.019		
<b>Behavioral Engagement</b>									.821	.804
I keep my attention on the work for the entire lesson.	3.79 (.68)	3.56 (.45)	.020	.054	-.008	.006	<b>.795</b>	<b>.736</b>		
I listen carefully when the teacher explains something.	3.99 (.56)	3.81 (.37)	-.011	-.070	-.035	-.035	<b>.893</b>	<b>.985</b>		
I try my best to complete class work.	4.33 (.41)	4.05 (.40)	.016	.056	.067	.078	<b>.610</b>	<b>.622</b>		
<b>Affective Engagement</b>									.529	.667
I feel myself as a part of the school.	3.24 (1.73)	2.98 (.91)	-.012	.036	<b>.562</b>	<b>.800</b>	.039	-.003		
I am proud to be part of this school.	3.42 (1.25)	3.12 (1.12)	.012	-.028	<b>.698</b>	<b>.918</b>	-.006	-.049		
I like what I learn in school.	3.38 (1.12)	3.12 (.80)	.035	.064	<b>.594</b>	<b>.716</b>	.052	.096		
I like the activities in this school	3.60 (.87)	3.24 (1.02)	-.019	.009	<b>.631</b>	<b>.770</b>	-.003	-.014		
I would rather be in this school than another school.	3.48 (1.50)	3.19 (1.58)	-.026	-.081	<b>.555</b>	<b>.832</b>	-.028	-.061		
Students like me feel safe in this school (e.g., students are not bullied).	3.25 (1.64)	3.18 (1.24)	.043	-.040	<b>.480</b>	<b>.758</b>	-.016	-.035		
I feel accepted by my classmates.	3.33 (1.32)	3.33 (.91)	.023	-.009	<b>.470</b>	<b>.668</b>	.019	.025		

## Mplus Syntax

### Estimating factor scores for student engagement using the ESEM-within-CFA (EwC) approach

Step 1: Obtain start values from ESEM solution

#### DATA:

File is xxx.dat;

#### Variable:

Names are

studid,ce1,ce2,ce3,ce4,ce5,ce6,be1,be2,be3,  
cons1,cons2,cons3,cons4,cons5,cons6,cons7;

Usevariables are

ce1,ce2,ce3,ce4,ce5,ce6,be1,be2,be3,  
cons1,cons2,cons3,cons4,cons5,cons6,cons7;

Missing are all (-999);

Idvar is studid;

#### ANALYSIS:

Estimator is mlr;

Rotation=Target;

#### MODEL:

*!The label ~0 denotes that all non-target cross-loadings are freely estimated but targeted to be !as close to zero as !statistically possible. The label (\*1) denotes that lce lcons lbe (with !cross-loadings between factors) are a set ESEM factors.*

lce by ce1-ce6 cons1-cons8~0 be1-be3~0 (\*1); ce2 with ce3;

lcons by cons1-cons8 ce1-ce6~0 be1-be3~0 (\*1); cons7 with cons6;

lbe by be1-be3 cons1-cons8~0 ce1-ce6~0 (\*1);

!se by ce1,ce2,ce3,ce4,ce5,ce6,cons1,cons2,cons3,cons4,cons5,cons6,cons7,cons8

!be1,be2,be3 (\*1);

!se by lce@1 lcons@1 lbe@1;

!Savedata:

!file is se.dat;

!save=fscores;

#### OUTPUT:

sampstat stand svalues;

Step 2: Re-expressing the ESEM in Step 1 as a hierarchical CFA model

DATA:

File is xxx.dat;

Variable:

Names are

studid,ce1,ce2,ce3,ce4,ce5,ce6,be1,be2,be3,  
cons1,cons2,cons3,cons4,cons5,cons6,cons7;

Usevariables are

ce1,ce2,ce3,ce4,ce5,ce6,be1,be2,be3,  
cons1,cons2,cons3,cons4,cons5,cons6,cons7;

Missing are all (-999);

Idvar is studid;

ANALYSIS:

Estimator is mlr;

MODEL:

*!copy and paste start values from ESEM solution*

lce by ce1\*0.42133;

....

lbe by ce6\*0.01835;

se by lbe lce lcons;

ce2 with ce3;

cons7 with cons6;

ce1-ce6 (r1-r6);

cons1-cons8 (r7-r14);

be1-be3 (r15-r17);

Model constraint:

*!Constrain residuals to be non-zero*

r1>.01; r2>.01; r3>.01; r4>.01; r5>.01; r6>.01;

r7>.01; r8>.01; r9>.01; r10>.01; r11>.01; r12>.01;

r13>.01; r14>.01; r15>.01; r16>.01; r17>.01;

SAVEDATA:

file is se.dat;

save=fscores;

missflag=-999;

## Estimating the effect of parent involvement profiles on student engagement with predictor covariates using the manual BCH method

### *BCH Step 1:*

#### DATA:

File is xxx.dat;

#### VARIABLE:

Names are

studid gen res pa se spi1,spi2,spi3,spi4 spi5 sppi1,sppi2,sppi3,sppi4,sppi5;

! (covariates) gen=gender, res=residence, pa=authoritative parenting,

! (outcome) se=student engagement

! (profile indicators) spi=parent involvement at school, sppi=student perceptions of parent

! involvement

Usevariables are spi2,spi3,spi5,spi6 spi7,sppi1,sppi2,sppi3,sppi5,sppi6;

Missing are all (-999);

Idvar is studid;

Classes = c(4);

Auxiliary = gen,res,pa,se;

#### ANALYSIS:

Type = mixture;

Starts = 1000 200;

Processor = 4(starts);

#### SAVEDATA:

File is bchweights.dat;

Save = bchweights;

Missflag = -999;

*BCH Step 2:*

DATA:

File is bchweights.dat;  
!Reads in the datafile saved from Step 1

VARIABLE:

Names are  
spi1,spi2,spi3,spi4,spi5,sppi1,sppi2,sppi3,sppi4,sppi5,gen,res,pa,se,  
bchw1,bchw2,bchw3,bchw4,studid;

Usevar are  
bchw1,bchw2,bchw3,bchw4,gen,res,pa,se;

Missing are all (-999);  
Idvar is studid;  
Classes = c(4);  
Training = bchw1 bchw2 bchw3 bchw4 (bch);  
!Incorporate BCH weights into the analysis as training variables

ANALYSIS:

Type = mixture;  
Starts = 0;  
!Random start values are not needed in step 2

MODEL:

%OVERALL%  
C on gen pa;  
!C reflects the arbitrary label used to define the latent class variable under "Classes"  
se on gen res pa;

!labels are assigned to means of distal outcomes for additional tests under model constraints

%C#1%  
[se] (sec1);  
se (ser1);     !residuals requested for Cohen's *d* estimations  
%C#2%  
[se] (sec2);  
se (ser2);  
%C#3%  
[se] (sec3);  
se (ser3);  
%C#4%  
[se] (sec4);  
se (ser4);

OUTPUT: Sampstat Tech1 Tech4;

MODEL CONSTRAINT:

!New variables are created to enable further tests of pairwise mean comparisons of distal  
!outcome (student engagement). Tests of significance differences are based on the delta  
!method and accompanied by effect sizes reported as Cohen's  $d$  ( $\frac{M_{diff}}{\sqrt{pooled\ SD}}$ ); *SDs* obtained  
!from residuals.

!New variables are created to test all possible pairwise mean comparisons

new (sec1v2 sec1v3 sec1v4 sec2v3 sec2v4 sec3v4);

!New variables are created to estimate Cohen's  $d$

new (dsec1v2 dsec1v3 dsec1v4 dsec2v3 dsec2v4 dsec3v4);

sec1v2 = sec1-sec2;

sec1v3 = sec1-sec3;

sec1v4 = sec1-sec4;

sec2v3 = sec2-sec3;

sec2v4 = sec2-sec4;

sec3v4 = sec3-sec4;

dsec1v2 = sec1v2/((sqrt((ser1+ser2)/2)));

dsec1v3 = sec1v3/((sqrt((ser1+ser3)/2)));

dsec1v4 = sec1v4/((sqrt((ser1+ser4)/2)));

dsec2v3 = sec2v3/((sqrt((ser2+ser3)/2)));

dsec2v4 = sec2v4/((sqrt((ser2+ser4)/2)));

dsec3v4 = sec3v4/((sqrt((ser3+ser4)/2)));