

家長參與和家庭支援對提高澳門青少年 閱讀素養的影響

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本文旨在利用澳門特別行政區參與 PISA 2009 閱讀素養研究計劃所收集的學生測試和家長問卷數據，探討家長參與及家庭支援對澳門 15 歲學生閱讀素養的影響。透過結構方程模型(SEM)和多階線性模型(HLM)的分析，辨識家長參與、家庭支援孩子的閱讀素養，以及家庭閱讀資源的供給與 15 歲學生閱讀素養表現的內在聯系。本研究在控制了家庭社經文化地位(ESCS)和性別變項的因素後，發現三項關於家長參與孩子閱讀素養的變項對澳門 15 歲學生閱讀素養表現並沒有直接的獨立效果影響。三項家長參與變項總的非直接效果影響不甚強，經驗證後主要是透過中間過程變項，即家庭閱讀資源的供給間接影響澳門 15 歲學生的閱讀素養表現。基於本研究之結果，建議澳門家長與教師應攜手合作，建立良好的家庭閱讀環境，以促進青少年的閱讀素養發展。

關鍵字：閱讀素養、家長參與、家庭支援、PISA 2009

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Introduction

Reading literacy is a fundamental competence cherished worldwide and nourished early in childhood (Clay, 1967; Anderson, Hiebert, Scott & Wilkinson, 1985). Unless resources and environments are available from the earliest stage, a child is unlikely to read well or love to read (Gates, 2002). Because reading acquisition is not a natural process, without appropriate parental guidance and support our literate society will have youngsters and adults who are illiterate (Lyon, 1998). Research shows that certain kinds of parental engagement and home activities do make a difference to young children's reading literacy development (Finn, 1998). However, some parent's engagement and home reading activities are more effective than others, suggesting that family literacy is needed for all family members working together to promote mutual literacy development (Smith, 1991). Teachers and parents can partner to create conducive environments to support children's reading acquisition at home and in the classroom (Finn, 1998; Marion, 2000; Darling, 2005).

Throughout childhood, there are changing roles for parents in motivating their children to learn to read, and after that to read to learn (Klauda, 2009). For the unmotivated or uneducated parents, promoting their adolescent children's reading motivation and activities is daunting and this is especially the case of the struggling readers (Baker, 2003). It is reckoned that unmotivated and uneducated parents are less likely to create developmentally appropriate environments for their adolescent children to read to learn. Making use of the parent data collected in the PISA 2009 Study (OECD, 2010a), the present study examines the effects of parental engagement and home support for the enhancement of reading literacy of 15-year-old students in Macao.

Students participated in the PISA 2009 Study needed to respond to a 2-hour test booklet on reading literacy, together with a 40-50 minutes student questionnaire. Some participating countries/economies opted to have an additional parent questionnaire and the electronic component of reading literacy assessment administered to their sampled students. The PISA 2009 Consortium defined reading literacy as "understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society" (OECD, 2010a, p.37). Design of test booklets and questionnaires were based on a reading assessment framework focusing on: (1) TEXTS (i.e. what kind of text must student read?); (2) ASPECTS (i.e. what is the reader's purpose and approach to the text?); and (3) SITUATION (i.e. what is the intended use of the text, from the author's point of view?) (OECD, 2010a, p.38).

The conceptual model and analytical framework

There are a number of considerations pertinent to the conceptualization of the conceptual model and analytical framework of the present study. Bearing in mind parent and student data will be drawn from the PISA 2009 Study, three considerations are elucidated below:

First, in statistical modeling of large-scale survey data, it is important to have a conceptual model explicating conceptualization of the key variables and their inter-relationships. For the purposes of the present study, the key variables, amongst others, are: parental engagement, home support, learning environment and reading literacy. The research literature is replete with both quantitative and qualitative studies examining these key variables and interrelationships (e.g. Fehrmann, Keith, & Reimer, 1987; Keith, Keith, Bickley, & Singh, 1992; Ho & Willms, 1996; Catsambis, 2001; Fan, 2001; Fan & Chen, 2001; Desforges, 2003; Farris, Fuhler, & Walther, 2004; Paratore, Cassano, & Schickedanz, 2011; Rodriguez-Brown, 2011). Earlier researcher Epstein (1992) maintained that parental practices that establish a positive learning environment at home have potentials to make a difference to student learning and achievement. Almost two decades later, Harris, Andrew-Power, and Goodall (2009) reckoned that it is parental engagement in learning that brings significant gains in achievement. Now it is a common consensus that parental engagement occurs where parents are actively involved in supporting learning in the home through extension or support activities, homework or online activities. The 2009 National Survey in the United Kingdom on young people's reading attests the significance of the home environment and family support on reading literacy development (Clark & Hawkins, 2010). In this national survey, reading literacy is envisaged as one important developmental area where parents have the simple facilities (e.g. a book or other reading materials) to become involved and to make a difference. The survey results show that: (1) reading resources in the home; (2) parental encouragement to read; (3) parents being seen to be reading; and (4) talking about reading with family, are important variables contributory to reading literacy development.

Based on the review of research literature, the present study will make use of a number of variable constructs (i.e. parent's support of child's reading literacy at beginning of primary education, motivational attributes of parent's own reading engagement, parent's current support of child's reading literacy, and provision of reading resources for child's use at home) conceptualized by the PISA 2009 Consortium to serve as explanatory variables exemplifying the effects of parental engagement and home support on children's reading literacy development.

Regarding the causal influence structure of the parental engagement and home

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support explanatory variables, Hoover-Dempsey and Sandler (1995), after examining a number of contemporary models, proposed a conceptual model which seeks to explain: (1) why parents choose to become involved in their children's education; (2) what forms their involvement will take; and (3) why their involvement influences their children's educational outcomes. In their parental engagement and home support conceptual model, parental involvement decisions influence parents' choice of involvement forms and engagement mechanisms, and their joint effects on student learning outcomes are influenced by two in-between process variables: (1) parents' selection of developmentally appropriate involvement strategies, and (2) the fit between parental involvement activities and the school's expectations for their involvement.

The present study will make use of the two constructs conceptualized by the PISA 2009 Consortium: (1) parent's current support of child's reading literacy, and (2) provision of reading resources for child's use at home, to serve as proxies of the two in-between process variables in Hoover-Dempsey and Sandler's (1995) model of parental involvement. It is hoped that the two process variables are able to channel the joint effects of parent's support of child's reading literacy at beginning of primary education and motivational attributes of parent's own reading engagement on reading literacy performance (see Figure 1 below for the conceptual model used in the present study).

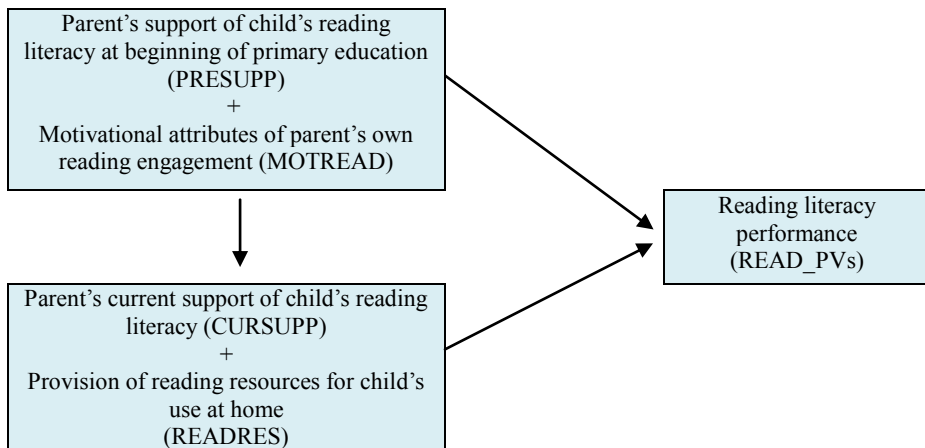


Figure 1 Conceptual model depicting the central role of parent's current support of child's reading literacy and provision of reading resources for child's use at home as in-between process variables for the enhancement of reading literacy performance

Second, it is important to take ESCS of the home into account when effects of parental engagement and home support on reading acquisition and attainment are examined. As an example, De Jong and Leseman (2001) carried out a study to examine effects of home literacy on the development of reading comprehension. The sample was deliberately heterogeneous in terms of ESCS. This study established that home environment pertains to children's opportunity for educational interactions, as well as parents' instructional and socio-emotional quality during literate (e.g. joint book reading) and non-literate (e.g. joint problem solving) activities. The research results revealed that for both literate and non-literate interactions parents' instructional (e.g. non-immediate discourse about informative topics) and socio-emotional qualities (e.g. positive and rewarding remarks) had an effect on the development of reading comprehension.

Another study by Vandermaas-Peeler, Nelson, Bumpass and Sassine (2009) revealed similar results that parent-child interactions during reading are related to the child's social contexts of development. Middle income parents tend to provide greater support for their children's early literacy learning, e.g. engage in more teaching during reading, and read to their children daily. The researchers of this study concur with Kohn's (1963) viewpoint arguing that parents generally have a tendency to socialize their children by engaging reading with them based on economic circumstances in order to prepare them for educational and occupational environments likely to be in their future. Because of these research results, effects of parental engagement and home support on reading literacy will be examined in the present study after accounting for the effect of ESCS of the sampled students.

Third, it is important to point out that the parental engagement and home support variables presented in Figure 1 may not exhibit their significant practical effects on reading literacy performance as they should be, resulting in small correlations amongst the variables. There are two plausible reasons for this. The first reason pertains to parents of the low ESCS families. Hoover-Dempsey and Sandler (1995) remarked that the parental involvement (or engagement) variables should pertain for most parents, and the exception would seem to be parents whose life circumstances create very high socio-demographic risk for poor outcomes (e.g. a combination of low education, low or no income, marginal skills, never-married parental status, and poor health). However, when appropriate research design is adopted there is optimism to demonstrate that parental engagement and home support do make a difference for low-income families. For example, drawing on data from a longitudinal study of language and literacy development of children

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from low-income families, Dickinson and De Temple (1998) examined the hypothesis that parental reports of their home support for literacy from the preschool years can be good predictors of early literacy development once their children enter school. Parental reports from the preschool years can account for a quarter of the variance in kindergarten as well as grade one teacher assessments, and over a third of the variance in a decoding assessment given near the end of the first grade. An explanation provided by the researchers for this impressive predictive power is that parents' reports are based on long-term observation of their child's inclinations and aptitudes.

The second reason pertains to the age of the students. Bus and Van Ijzendoorn (1995) conducted quantitative meta-analysis of the available empirical evidences related to parent-preschooler reading and several outcome measures. It was found that parent-preschooler reading is related to outcome measures such as reading achievement, and the overall effect size indicates that book reading explains about 8% of the variance in the outcome measure. While the effect of parent-preschooler reading is not dependent on the socio-economic status of the families, the effect seems to become smaller as soon as children become conventional readers who are able to read on their own.

As the mean of ESCS of the sampled students for Macao is located at the lower end of the continuum and that the sampled students of the present study are all adolescents (i.e. aged 15), the effects of parental engagement and home support on reading literacy development may not be empirically visibly exhibited in the present study. More elaborate analytical procedures are needed in the modeling of the causal influence structure of the survey data of the PISA 2009 Study.

The Research Sample

In 2009, 5996 15-year-old students (3036 males and 2960 females) from a total of 45 secondary schools were sampled for the PISA 2009 reading literacy study (OECD, 2010a). The sample by design is a census because all eligible schools and students are sampled. The response rate for schools and students are 100% and 99.3% respectively. The sample used for the ensuing analyses comprises 5952 students (3011 males and 2941 females), and appropriate school and student weights are applied to adjust for the small sampling errors due to the slightly less than perfect student response rate. The two-stage sampling involving inclusion of all schools in the first stage followed by all eligible students in the second stage

necessitates data analyses to take into consideration the nested structure of the sample design (see Cheung & Sit, 2010 for the Macao PISA 2009 report).

Research Questions

In PISA 2009, there are questions in the parent questionnaire pertaining to parental engagement and home support for child's reading literacy (OECD, 2010a). Not all participating countries/economies asked their 15-year-old sampled students to have the parent questionnaire responded by their guardians. Macao was one of the fourteen countries/economies with usable data for the present study. The questions are: (1) parent's reading activities when their child attended the first year of primary school (e.g. read books, write letters or words); (2) motivational attributes of parent's own reading engagement (e.g. reading is one of their favorite hobbies); (3) parent's current home and reading activities with children (e.g. discuss how well the child is doing at school); and (4) provision of reading resources for child's use at home (e.g. Internet connection, chat online, books of the child's own).

Scaling of the parent responses to the above-mentioned questions are undertaken by the PISA 2009 Consortium for all the 14 participating countries/economies. Application of factor analyses and Item Response Theory (IRT) results in the composition of the four conceptually clear and empirically distinct constructs to interrelate with reading literacy performance, namely: (1) parent's support of child's reading literacy at beginning of primary education (PRESUPP: 9 items); (2) motivational attributes of parent's own reading engagement (MOTREAD: 4 items); (3) parent's current support of child's reading literacy (CURSUPP: 6 items); and (4) provision of reading resources at home for child's use (READRES: 6 items). Interested researchers can access these constructs publicly from the OECD/PISA official website (i.e. <http://www.pisa.oecd.org>).

Figure 1 depicts the conceptual model used in the present study. In this model, the joint influences of parent's support of child's reading literacy at beginning of primary education (PRESUPP) and motivational attributes of parent's own reading engagement (MOTREAD) on reading literacy performance (READ_PVs) are channeled by parent's current support of child's reading literacy at home (CURSUPP) and provision of reading resources for child's use at home (READRES). This model highlights the central role of parent's current support of child's reading literacy and provision of reading resources for child's use at home as in-between process variables for the enhancement of reading literacy performance.

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Making use of the PISA 2009 Macao dataset, the following three research questions are answered with specific reference to 15-year-old secondary students in Macao:

1. What are the frequency distributions of questions pertaining to the parental engagement and home support of child's reading literacy constructs?
2. What are the interrelationships amongst parental engagement and home support of child's reading literacy constructs with reading literacy performance?
3. To what extent the effects of parent's support of child's reading literacy at beginning of primary education and motivational attributes of parent's own reading engagement on reading literacy performance are channeled by current support of child's reading literacy and provision of reading resources for child's use at home? To what extent the effects become after accounting for the effects of ESCS of the home and gender of student?

Data Analysis Methodology

For research question 1, frequency distributions of parent's responses to questions pertaining to their engagement and support of home and reading activities are carried out. For research question 2, breakdown of reading literacy score on each response category of parent's responses to questions pertaining to their engagement and support of home and reading activities are undertaken, followed by Pearson correlations of the constructs delineated in the conceptual model in Figure 1 are calculated. Structural Equation Modeling (SEM) is deployed to test the hypothesis that parent's current support of child's reading literacy and provision of home reading resources are in-between process variables channeling the joint effects of parent's support of child's reading literacy at beginning of primary education and motivational attributes of parent's own reading engagement on reading literacy performance. For research question 3, Hierarchical Linear Modeling (HLM) is applied to examine the direct and indirect effects of parent's current support of child's reading literacy and provision of reading resources for child's use at home on reading literacy performance, over and above the effects of parent's support of child's reading literacy at beginning of primary education and motivational attributes of parent's own reading engagement, after taking into account the effect ESCS of the

home and gender of student.

Research Findings

Research Question 1

Table 1 shows that parent-supported reading activities performed most at child's beginning year of primary education are reading books and writing letters or words. More than 50% of the parents perform these two activities at least once or twice a week. On the contrary, singing songs, playing alphabet toys, talking about what parents had read, playing word games, and reading aloud signs and labels are never or hardly ever carried out for more than 30% of the sampled students.

Table 1 Frequency distribution of parent's support of child's reading literacy at beginning of primary education

Parent-supported reading activities for primary one students	%			
	Never/ Hardly ever	Once or twice a month	Once or twice a week	Every or almost everyday
Read books	21	26	29	24
Tell stories	27	33	29	11
Sing songs	35	28	25	12
Play alphabet toys	30	28	30	12
Talk about things parent had done *	19	41	27	13
Talk about what parent had read	35	37	21	7
Play word games	41	30	22	7
Write letters or words	18	20	29	33
Read aloud signs and labels	40	23	22	15

* This item has not been included in the composition of the PRESUPP construct

On the whole, motivational attributes of parent's own reading engagement is very favorable. Table 2 shows that more than 60% of the parents agree or strongly agree that reading is one of their favorite hobbies, they feel happy if they receive a book as a present, and that they enjoy going to a bookstore or library. In spite of this favorable motivation, there are more than 10% of the parents remarking that reading

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is a waste of time for them.

Table 2 Frequency distribution of motivational attributes of parent's own reading engagement

Motivational attributes of parent's own reading engagement	%			
	Strongly Agree	Agree	Disagree	Strongly Disagree
Reading is one of my favorite hobbies	15	57	23	4
I feel happy if I receive a book as a present	11	58	26	5
For me, reading is a waste of time*	2	9	62	27
I enjoy going to a bookstore or a library	11	51	30	8

* Reverse coding is applied in the composition of the MOTREAD construct

Table 3 shows that parent-supported reading activities performed most for 15-year-old students are: (1) discussing books, films or television programs, and (2) discussing how well their children are doing at school. More than 50% of the parents performed these two activities at least once or twice a week. On the contrary, going to a bookstore or library with their children, talking with their children about what they are reading on their own, and helping their children with their homework are performed less than once or twice a month for some 70% of the sampled students. Eating the dinner with their children around a table, albeit not really considered as a home reading activity, is a very common home activity occurred at least once or twice a week in more than 90% of the homes of 15-year-old students in Macao.

Table 3 Frequency distribution of parent's current support of child's reading literacy

Parent-supported reading activities for 15-year-old students	%			
	Never/ Hardly Ever	Once or twice a month	Once or twice a week	Every or almost everyday
Discuss political or social issue	28	40	24	8
Discuss books, films or television programs	13	34	36	17
Discuss how well your child is doing at school	8	30	37	25
Eat the dinner with your child around a table*	2	5	10	83
Spend time just talking to your child*	8	25	35	32
Go to a bookstore or library with your child	50	42	7	2
Talk with your child about what he/she is reading on his/her own	39	40	16	5
Help your child with his/her homework	40	29	17	14

*This item has not been included in the composition of the CURSUPP construct

Table 4 shows that home reading resources for child's use on the whole is very favorable. More than 79% of the homes have access to email, online chat, Internet connection, and children have books of their own. Some 60% of the homes have access to daily newspaper and 35% have subscription to a journal or magazine.

Table 4 Frequency distribution of provision of reading resources for child's use at home

Reading resources for child's use at home	%
Email	80
Online chat	88
Internet connection	92
Daily newspaper	59
A subscription to a journal/magazine	35
Books of his/her very own	79

Research Question 2

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Table 5-8 present the breakdown of reading literacy score on each response category of items of parent’s support of child’s reading literacy at beginning of primary education (PRESUPP), motivational attributes of parent’s own reading engagement (MOTREAD), parent’s current support of child’s reading literacy (CURSUPP), provision of child’s reading resources at home (READRES). Amongst the four scales analyzed, most items of PRESUPP, CURSUPP and READRES reveal a pattern of linear relationships with reading literacy performance. For those few items which do not reveal a clear pattern of linear relationships with reading literacy performance can do so after appropriate grouping of adjacent categories. For MOTREAD, only the item “For me reading is a waste of time” shows a clear pattern of linear relationship with reading literacy performance. In this regard, the Pearson correlation of MOTREAD with READ_PVs is expected to be very weak and is not statistical significant.

Table 5 Breakdown of reading literacy score on each response category of parent’s support of child’s reading literacy at beginning of primary education

Parent-supported reading activities for primary one students	Mean Reading Literacy			
	Never/ Hardly ever	Once or twice a month	Once or twice a week	Every or almost everyday
Read books	480.37	487.66	489.21	490.25
Tell stories	482.01	484.97	490.30	500.05
Sing songs	484.04	486.92	489.21	494.18
Play alphabet toys	485.24	487.18	488.33	489.62
Talk about things parent had done *	483.42	484.11	491.37	494.65
Talk about what parent had read	486.25	487.28	487.80	491.52
Play word games	486.15	486.65	489.87	489.53
Write letters or words	480.34	486.64	487.91	490.70
Read aloud signs and labels	486.77	488.10	485.95	489.31

* This item has not been included in the composition of the PRESUPP construct

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Table 6 Breakdown of reading literacy score on each response category of motivational attributes of parent's own reading engagement

Motivational attributes of parent's own reading engagement	Mean Reading Literacy			
	Strongly Agree	Agree	Disagree	Strongly Disagree
Reading is one of my favorite hobbies	490.02	486.58	487.57	485.58
I feel happy if I receive a book as a present	484.27	487.88	487.70	483.59
For me, reading is a waste of time*	470.90	473.76	487.18	492.95
I enjoy going to a bookstore or a library	491.54	486.10	487.16	489.14

* Reverse coding is applied in the composition of the MOTREAD construct

Table 7 Breakdown of reading literacy score on each response category of items on parent's current support of child's reading literacy

Parent-supported reading activities for 15-year-old students	Mean Reading Literacy			
	Never/ Hardly Ever	Once or twice a month	Once or twice a week	Every or almost everyday
Discuss political or social issue	475.02	488.48	493.66	505.86
Discuss books, films or television programs	479.19	483.87	489.48	495.90
Discuss how well your child is doing at school	482.60	486.55	489.20	487.67
Eat the dinner with your child around a table*	468.43	459.32	480.40	490.14
Spend time just talking to your child*	475.36	484.12	486.34	493.56
Go to a bookstore or library with your child	481.08	494.68	487.52	486.78
Talk with your child about what he/she is reading on his/her own	486.17	490.60	485.24	478.77
Help your child with his/her homework	495.06	487.03	475.89	479.78

* This item has not been included in the composition of the CURSUPP construct

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Table 8 Breakdown of reading literacy score on each response category of items on provision of reading resources for child's use at home

Reading resources for child's use at home	Mean Reading Literacy	
	Yes	No
Email	493.93	462.65
Online chat	489.46	469.10
Internet connection	490.30	455.17
Daily newspaper	490.03	484.10
A subscription to a journal/magazine	486.45	487.83
Books of his/her very own	494.96	460.11

Table 9 presents the Pearson correlations amongst parent's support of child's reading literacy at beginning of primary education (PRESUPP), motivational attributes of parent's own reading engagement (MOTREAD), parent's current support of child's reading literacy (CURSUPP), provision of child's reading resources at home (READRES), and reading literacy performance (READ_PVs).

Table 9 Pearson correlations of variables pertaining to parental engagement and home support with reading literacy performance for 15-year-old students in Macao

	Parental engagement and home support of child's reading literacy				Reading literacy performance (READ_PVs) Y ₁
	(PRESUPP) X ₁	(MOTREAD) X ₂	(CURSUPP) X ₃	(READRES) X ₄	
X ₁	1.000				
X ₂	0.339** (0.012)	1.000			
X ₃	0.551** (0.010)	0.363** (0.011)	1.000		
X ₄	0.224** (0.014)	0.157** (0.013)	0.237** (0.013)	1.000	
Y ₁	0.048** (0.014)	0.026 (0.014)	0.034** (0.014)	0.158** (0.013)	1.000

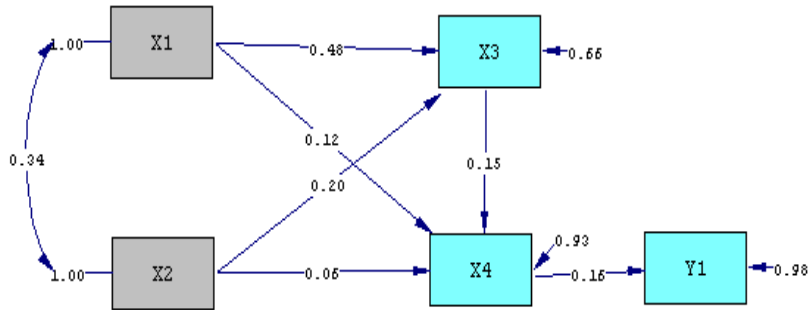
Note: Standard error of the correlation is enclosed in brackets. In the calculation of the measurement and sampling errors, replicate analyses have been carried out to take the complexity of the two-stage nested sample design into account.

Except correlation between motivational attributes of parent's own reading engagement with reading literacy performance ($r=0.026$), all correlations are statistically significant ($p<0.050$). Child's reading literacy at beginning of primary education, motivational attributes of parent's own reading engagement, current support of child's reading literacy and provision of reading resources for child's use at home, all are manifestations of parent's engagement and support of reading literacy, are shown to be correlated amongst themselves (r ranges from 0.157 to 0.551). The correlation coefficients show that current support of child's reading literacy and provision of reading resources for child's use at home may serve as an in-between process variable channeling the effect of parent's support of child's reading literacy at beginning of primary education and motivational attributes of parent's own reading engagement on student reading literacy performance.

Research Question 3

Guided by the conceptual model shown in Figure 1, the SEM results of the correlation matrix (i.e. Table 9) recapitulate the central role of current support of child's reading literacy and provision of reading resources for child's use at home as in-between process variables. Figure 2 shows that the joint effects of parent's support of child's reading literacy at beginning of primary education (X_1) and motivational attributes of parent's own reading engagement (X_2) on reading literacy performance (Y_1) is channeled by parent's current support of child's reading literacy (X_3) and provision of reading resources for a child's use at home (X_4). The causal influence structure explains why the correlations of X_1 , X_2 and X_3 with Y_1 respectively are small in magnitude (0.048, 0.026, and 0.034). This is because the direct and indirect effects of X_1 , X_2 and X_3 on Y_1 are channeled through essentially by X_4 . The model results shown in Figure 2 have been validated in this study to be associated with satisfactory fit statistics (i.e. Minimum fit function Chi-square=1.935, $df=3$, $p=0.586$; Root mean square error of approximation (RMSEA)=0.000, p -value for test of close fit=1.000; Root mean square residual (RMR)=0.003, Standardized RMR=0.003; Goodness of fit (GFI) index=1.000, Adjusted goodness of fit index (AGFI)=1.000; see Fan, Thompson, & Wang, 1999 for a discussion of the SEM fit indices).

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Chi-Square=1.93, df=3, P-value=0.58607, RMSEA=0.000

Figure 2 SEM path model depicting the central role of parent’s current support of child’s reading literacy and provision of reading resources at home as in-between process variables for the enhancement of reading literacy performance

The HLM (Model A) results shown in Table 10 below reveals that after accounting for the effects of ESCS and gender of student, the independent fixed effects of parent’s support of child’s reading literacy at beginning of primary education and motivational attributes of parent’s own reading engagement on reading literacy performance (i.e. 0.79 and -1.71 respectively) are not statistically significant ($p>0.05$). The small non-significant effect of MOTREAD (i.e. -1.71) is a consequence of statistical collinearity amongst the predictor variables in the level-1 model (see Fan, 2001 for a discussion of similar results in studies of parental involvement).

Level-1 Model:

$$READ_PVs = B_0 + 0.79* PRESUPP - 1.71* MOTREAD + B_5* ESCS + B_6* FEMALE + R$$

Level-2 Model:

$$B_0 = 473.29 + U_0; B_5 = 6.38 + U_5; B_6 = 21.72 + U_6$$

Combined Model (excluding the non-significant effects at level-1 and level-2):

$$READ_PVs = 473.29 + 6.38 * ESCS + 21.72* FEMALE + U_5* ESCS + U_6* FEMALE + U_0 + R$$

The HLM (Model B) results show that after taking the effects of ESCS and FEMALE, as well as PRESUPP, MOTREAD and CURSUPP into account, the independent fixed effect of reading resources for child’s use at home (i.e. READRES) on reading literacy performance (i.e. 7.14) is statistically significant ($p < 0.05$). The independent fixed effect of parent’s current support of child’s reading literacy (i.e. CURSUPP) on reading literacy performance (i.e. -1.53) is not statistically significant ($p > 0.05$). The findings demonstrate the centrality of provision of reading resources for child’s use at home as an in-between process variable channeling the joint effects of parental engagement and home support on reading literacy performance when the effects of ESCS and gender of student have been taken into account.

Level-1 Model:

$$\text{READ_PVs} = B_0 + 0.79 * \text{PRESUPP} - 1.79 * \text{MOTREAD} + B_3 * \text{CURSUPP} + 7.14 * \text{READRES} + B_5 * \text{ESCS} + B_6 * \text{FEMALE} + R$$

Level-2 Model:

$$B_0 = 472.17 + U_0; B_3 = -1.53 + U_3; B_5 = 4.76 + U_5; B_6 = 20.42 + U_6;$$

Combined Model (excluding the non-significant effects at level-1 and level-2):

$$\text{READ_PVs} = 472.17 + 7.14 * \text{READRES} + 4.76 * \text{ESCS} + 20.42 * \text{FEMALE} + U_0 + U_5 * \text{ESCS} + U_6 * \text{FEMALE} + R$$

Table 10 HLM parental engagement and home resource support model (N=5952)

HLM Parent Model	Model A		Model B	
	<i>Level-1 Model:</i>		<i>Level-1 Model:</i>	
X ₁ = PRESUPP	Y = B ₀ + B ₁ *X ₁ + B ₂ *X ₂ +		Y = B ₀ + B ₁ *X ₁ + B ₂ *X ₂ +	
X ₂ = MOTREAD	B ₅ *X ₅ +B ₆ *X ₆ + R		B ₃ *X ₃ + B ₄ *X ₄ +	
X ₃ = CURSUPP			B ₅ *X ₅ +B ₆ *X ₆ + R	
X ₄ = READRES	<i>Level-2 Model:</i>		<i>Level-2 Model:</i>	
X ₅ = ESCS	B ₀ = G ₀₀ + U ₀ ; B ₁ = G ₁₀ ;		B ₀ = G ₀₀ + U ₀ ; B ₁ = G ₁₀ ;	
X ₆ = FEMALE	B ₂ = G ₂₀ ; B ₅ = G ₅₀ + U ₅ ;		B ₂ = G ₂₀ ; B ₃ = G ₃₀ + U ₃ ;	
Y ₁ = READ_PVs	B ₆ = G ₆₀ + U ₆		B ₄ = G ₄₀ ; B ₅ = G ₅₀ + U ₅ ;	
			B ₆ = G ₆₀ + U ₆	
Fixed Effects	Coefficient (SE)	p-value	Coefficient (SE)	p-value
<i>For intercept, B₀</i>				
Intercept, G ₀₀	473.29 (7.00)	0.000	472.17 (6.97)	0.000
<i>For X₁ slope, B₁</i>				

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Intercept, G ₁₀ For X ₂ slope, B ₂	0.79 (0.87)	0.361	0.79 (0.97)	0.421
Intercept, G ₂₀ For X ₃ slope, B ₃	-1.71 (1.39)	0.224	-1.79 (1.42)	0.212
Intercept, G ₃₀ For X ₄ slope, B ₄	-	-	-1.53 (1.17)	0.199
Intercept, G ₄₀ For X ₅ slope, B ₅	-	-	7.14 (0.98)	0.000
Intercept, G ₅₀ For X ₆ slope, B ₆	6.38 (1.70)	0.001	4.76 (1.74)	0.009
Intercept, G ₆₀	21.72 (2.23)	0.000	20.42 (2.22)	0.000
Random Effects	Variance	<u>p</u> -value	Variance	<u>p</u> -value
<i>Level-1 Model</i>				
R	4045.57		3997.09	
<i>Level-2 Model</i>				
Intercept B ₀ , U ₀	1980.73	0.000	1996.53	0.000
X ₁ slope B ₁ , U ₁	-	-	-	-
X ₂ slope B ₂ , U ₂	-	-	-	-
X ₃ slope B ₃ , U ₃	-	-	11.29	0.015
X ₄ slope B ₄ , U ₄	-	-	-	-
X ₅ slope B ₅ , U ₅	52.35	0.003	59.07	0.001
X ₆ slope B ₆ , U ₆	30.54	0.052	28.69	0.049

Discussion of findings

Worldwide across the globe, parents play a prominent role in the development of a child's early reading literacy (Sénéchal & LeFevre, 2002; Sénéchal, 2006). In Macao, upon entering primary schools, parents should have engaged their children in emergent reading activities, and the common ones revealed in PISA 2009 are reading storybooks, and writing letters or words with the children together. Upon entering secondary schools, parents should have further engaged their children in other reading activities, and the common ones revealed in PISA 2009 are that parents are in dialogue with their children on how well their child is doing at school and discussing books, films and television programs.

The first finding of the present study is that the kind of early parental engagement envisaged in PISA 2009 does not have a direct effect on reading literacy performance of the 15-year-old children in Macao. There is a statistical significant indirect effect via provision of resources for child's reading at home, as well as another statistical significant indirect effect first via parent's current support of child's reading literacy and then via provision of reading resources for child's use at

home, resulting in the weak correlation between parent's support of child's reading literacy at beginning of primary education and reading literacy performance. It is noteworthy that the direct effect of parent's support of child's reading literacy at beginning of primary education on their current support of child's reading literacy is pretty strong. Early parental engagement has shown in the present study to have a strong direct effect on later parental engagement up to their child's adolescent stage.

The second finding is that although research in other parts of the world often shows that parent's motivated reading engagement is very important for a child's reading literacy development (Baker, Scher & Mackler, 1997; Lee, Park & Kim, 2000; Lee, 2002; Darling, 2005). In Macao, it is found that parents with positive motivational attributes such as viewing reading as their favorite hobby or enjoying visiting bookstores or libraries do not have direct effect on reading literacy performance of their 15-year-old children. There is a statistical significant indirect effect via provision of resources for child's reading at home, as well as another statistical significant indirect effect first via parent's current support of child's reading literacy and then via provision of reading resources for child's use at home, resulting in the weak correlation between motivational attributes of parent's own reading engagement and reading literacy performance.

The third finding of the present study is that the direct effect of parent's current support of children's reading literacy on their child's reading literacy performance is not present. Similar to parent's support of child's reading literacy at beginning of primary education, there is weak but statistical significant indirect effect on provision of resources for child's reading at home, resulting in the very weak correlation between parent's current support of child's reading literacy and reading literacy performance of the 15-year-old children. Because the present study focuses on 15-year-old students, Fan's (2001) viewpoint is noteworthy to shed light on this third finding. He asserted that parental involvement may exert its influence early and gradually in a child's life and by the time students reach high school parental engagement effect is reflected in many aspects of students' accomplishments. The period from 8th to 12th grade may not be the best or the most sensitive time to measure that parental effect, resulting in small correlation between parental engagement and students' accomplishment measures.

In sum, the three findings of the SEM analyses show clearly the central role of provision of reading resources for child's use at home as an in-between process variable for the enhancement of reading literacy performance. After accounting for the effects of ESCS and gender of student, as well as that of earlier parental

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engagement and motivational attributes, the HLM analyses estimate that this channeling effect amounts to an increase of 7.14 reading literacy score points for one unit increase in provision of reading resources for child's use at home. This increase is modest because it amounts to roughly one fifth of the grade level performance in reading literacy of the 15-year-old student population in Macao.

Conclusion

Although the joint influence of parent's motivational attributes of reading engagement and their past and current support for student's reading literacy development may not be that appealing as it should be, provision of home reading resources that channels the effects of parental engagement and home support for the enhancement of reading literacy performance is not only statistically significant but also practically substantial. One plausible explanation is attributed to ESCS of the home in the Macao schooling context. Macao, special administrative region of Mainland China, is a place where ESCS of the home remains low in the past decade (i.e. mean of ESCS for Macao and OECD countries = -0.702 and 0.000 respectively; see also OECD, 2010b for Macao's mean and range of ESCS in comparison with other countries/economies). Admittedly, when a parent's educational qualification is only at the junior secondary or even primary level, it will be very difficult for him/her to know the most developmentally appropriate ways to engage in worthwhile exchanges and meaningful dialogues with their children with an aim seeking to promote reading literacy development. This is especially the case when the adolescent child becomes conventional readers as a result of their daily schooling. In spite of this shortcoming, it is customary for Macao parents and schools to make good use of the generous Government subsidies to enhance the material conditions of learning at school and at home, which is shown in the present study to cast significant impact on student's reading literacy performance.

More parent education is needed to empower parents to go hand in hand with teachers to inculcate emergent reading literacy in children. Parental involvement, channeled through or mediated by parent's use of developmentally appropriate activities with due attention paid to the fit between parental activities and the school's expectations, influences a child's developmental and educational outcomes through mechanisms such as modeling, reinforcement and instruction (Hoover-Dempsey & Sandler, 1995). Parents, schools and Macao community should strive to share consensual values and beliefs about reading and shoulder joint responsibilities for the creation of favorable reading literacy environments for

children as early as infancy onward up to the adolescent growth period. This recommendation is to acknowledge that human development occurs in a context of overlapping interdependent systems of social and cultural organizations (Bronfenbrenner, 1979).

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Parental Engagement and Home Support for the Betterment of Adolescents' Reading Literacy in Macao

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Macao, a special administrative region of China, participated in PISA 2009 reading literacy study. Through the use of the responses in the parent questionnaire and 15-year-old students' responses to the test booklets, the present study seeks to examine the effects of parental engagement and home support variables on reading literacy performance. We use Structural Equation Modeling (SEM) and Hierarchical Linear Modeling (HLM) to analyze the interrelationships amongst parental engagement and home support of child's reading literacy, provision of reading resources for child's use at home, and reading literacy performance. We discover that the direct independent effects of the parental engagement variables on reading literacy performance are negligible. However, there is a weak joint indirect effect essentially channeled through by an in-between process variable, i.e. provision of reading resources for child's use at home. This finding takes into account the effects of Economic, Social and Cultural Status (ESCS) of the home and gender of student. In the light of these findings, it is recommended that Macao parents and teachers go hand in hand developing better home literacy environments for the betterment of adolescents' reading literacy in Macao.

Keywords: reading literacy, parental engagement, home support, PISA 2009

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