

The Relationships among Parents' Socioeconomic Status, Parental Involvement and Academic Achievement in Taiwanese Middle School Students

Dr. Hsin-Yi Kung¹

Abstract

The higher academic performance of Chinese students is a subject that raises interest and concern among many educators and psychologists. Parental involvement has been recognized as an important explanation. The present study explored the various types of parental involvement Taiwanese parents have to promote their children's school success and how parental involvement mediated the indirect effect of socioeconomic status on children's achievement. Utilizing structural equation modeling, questionnaires were administered to 363 eighth grade students in central Taiwan. The results indicated that Taiwanese parents had high expectations, stress academic pressure, and were willing to make sacrifices for their children's education. Among the various types of parental involvement, parental encouragement/psychological support was found to be the most significant indicator. Parents' socioeconomic status has an indirect effect on children's academic achievement through the mediating effects of parental involvement, and has direct influence on children's academic achievement. The implications of the findings are explored and suggestions are made for further research regarding related issues.

Key Words: socioeconomic status, parental involvement, academic achievement, structural equation modeling

1. Introduction

Cross-cultural studies have found that East Asian groups of children of middle-school age from Taiwan, China, Hong Kong, and Singapore tend to have higher academic achievement than their American counterparts (Foy & Olson, 2009; Mullis, Martin, Foy, & Arora, 2012). The Trends in International Mathematics and Science Study (TIMSS) 2011 research for the International Association for the Evaluation of Educational Achievement (IEA) reported that Taiwanese children performed above the international average in mathematics at the fourth and eighth-grade levels. While a number of studies have sought to identify the factors influencing this achievement, parental involvement appeared to be the critical factor in students' academic achievement (Fan, 2001; Hong & Ho, 2005; Kung & Lee, 2016).

Over the years, research on parental involvement has resulted in a growing common understanding but there are still some major points that need to be discussed. In particular, the lack of consensus regarding the context-general and/or context-specific nature of parental involvement deserve attention. Parental involvement has been operationally defined in numerous ways, ranging from parental aspiration, expectation, interest, and attitudes and beliefs regarding education to more active parental participation and practice in specific activities at home or school. Although researchers have proposed specific dimensions of parental involvement (Grolnick & Slowiaczek, 1994; Hong & Ho, 2005), many have not recognized the context-specific nature of parental involvement that may have different effects on learning. The meaning of parental involvement might be context-specific in different cultural groups.

¹ Graduate Institute of Education, National Changhua University of Education, 1, Jin De Road, Paisha Village, Changhua 500, Taiwan. hykung@cc.ncue.edu.tw

In Amy Chua's recent popular memoir *Battle Hymn of the Tiger Mother*, she mentioned how "tiger parents" in Asian-heritage families "believe that they know what is best for their children (p. 53)" (2011). Research on parental involvement in various cultures is needed to specify the components regarded as most important for influencing academic achievement. A more precise and clear contextual construct of parental involvement is also necessary to address this issue from a cultural perspective.

In addition, prior research on Chinese students' academic achievement considers various types of parental involvement but none has been explicitly linked to parents' socioeconomic status. Social class (or socioeconomic status) refers to one's position within a society that is stratified according to status or power. More specifically, ecological considerations may well affect the approaches parents take when raising their children. It is widely accepted that parents' socioeconomic status influences students' academic achievement (Keith, Keith, Quirk, Sperduto, Santillo, & Killings, 1998; Long & Pang, 2016). However, the direct or indirect effects of parents' socioeconomic status on children's schooling still remain unclear. Of these findings, a particularly interesting one is that these factors have either a direct or an indirect effect on academic achievement. Little empirical research has linked these factors to students' academic achievement. Furthermore, most studies have focused on general definitions and measures rather than on specific domains and dimensions of these variables. This study aims to advance research on family socioeconomic status, parental involvement, and academic achievement by addressing related contextual and mediational issues.

1.1 The Cultural Meaning of Parental Involvement in Academic Achievement in Taiwan

In general, the term "parental involvement" includes different methods that parents engage in to assist with their children's daily learning process at home and school (Epstein, 2013). For example, parents spend time with their children and monitor their homework and other academic work at home, parents and children communicate about current school experiences, parents create a supportive and stimulating learning environment at home (i.e., the quality of home environment), or parents provide academic resources such as encyclopedias, academic books, computers, educational software, and a home library.

However, the meaning of parental involvement may be conceptualized differently for different cultural groups. For example, in the academically oriented Chinese society, parental involvement focuses mainly on school-related attitudes and any type of assistance that aids children's school performance (Chao, 2000; Ho, Chen, Tran, & Ko, 2010; Ho, Wang, & Kung, 2008). In regard to such traditional Chinese values, Taiwanese parents are no exception. Typical parental involvement is to have high expectations for children, exert pressure on children, and enroll children in enrichment classes. In their involvement, Taiwanese parents are possibly more likely to implement home-based involvement rather than school-based involvement (Kung & Lee, 2016; Wong-Lo & Bai, 2013). Taking all this into consideration, the perspective difference in the present study regarding parental involvement in Taiwan should be viewed as multidimensional components within cultural uniqueness.

Of particular interest to this study are Taiwanese students who perform well and Taiwanese parents who stress the importance of achieving academic success. A number of cross-cultural studies have sought to identify the parenting attributes that influence children's academic achievement such as parental attitudes including high expectations and encouragement/support of children and parental practices including structural/indirect and managerial/direct involvement (Chao, 2000; Wong-Lo & Bai, 2013). In addition, parents exert a great deal of pressure on their children to do well in school, invest a lot of their time and energy in their children's education but also give their children a lot of psychological and practical support (Kung & Lee, 2016). Research has demonstrated that not all kinds of parental involvement have a positive effect on academic performance. One possible explanation of these discrepant findings is the different measurements of parental involvement applied in these studies, specifically in those from different cultural backgrounds.

However, until recently, most studies on this issue mainly emphasized and reiterated the instruments and theories developed in the West. Few studies have been conducted to determine the "parental involvement" construct within Chinese culture. Nor has anyone explored what is meant by parental involvement in terms of at-home and at-school activities from an indigenous perspective.

The present study attempts to further substantiate the multidimensional construct of Taiwanese parental involvement, incorporating a cultural perspective to address this issue adequately and examining the effects of parental involvement on students' academic achievement.

1.2 The Direct and Indirect Effects of Socioeconomic Status on Academic Achievement

Although it is widely accepted that parents' socioeconomic status influences students' academic achievement (Keith et al., 1998; Long & Pang, 2016), the direct or indirect effects of parents' socioeconomic status on children's schooling still remain unclear. For example, utilizing the PISA dataset, Long and Pang (2016) indicated that the three components of SES (i.e., home educational resources, parental education, and family wealth) had significant indirect effects on both mathematics and problem-solving achievement through parental expectations. Other existing literature, however, presents contrary evidence suggesting that the effects of parental education per se are negligible or very small. Yue and Yang (1987) indicated that correlations between Chinese parents' education and students' achievement motivation were very low (less than .15). If students' academic achievement can genuinely benefit from their socioeconomic status, it must be questioned as to why the conclusions are, thus far, inconsistent.

The contradictory results might be attributed to Ho's (1994) argument that SES has indirect effects to mediate other factors such as parental influence on the child's learning. From such a viewpoint, SES can be viewed as a predictor and might mediate parental involvement and then affect children's achievement. It is important to examine the processes of how socioeconomic status relates to other parental factors and then facilitate children's academic achievement. Moreover, although the effects of SES cannot translate directly into the child's enculturation experience, it is impossible to disentangle the effects of these factors from children's subsequent academic achievement. Consequently, it is necessary to examine the directional effects among these factors. More research needs to be done to explore the parental factors influencing children's academic achievement simultaneously. The purpose of the present study is to examine the influence of family socioeconomic status and parental involvement on the academic achievement of middle school students in Taiwan. The study investigates a number of variables that may facilitate Taiwanese children's success in school and expects to uncover and verify more useful and applicable information relevant to parental beliefs and practices in the Taiwanese group. Considering the higher academic achievements of Taiwanese students, the current study may provide further insight into their achievement by examining parental involvement regarding education.

1.3 Research Questions

The present study addresses the following questions: (1) What types of parental involvement have been found to promote Taiwanese children's school success? (2) Among the various types of parental involvement, which one is the most important in promoting Taiwanese children's school success? (3) Does parents' socioeconomic status influence parental involvement and subsequently facilitate students' academic achievement for Taiwanese eighth graders? Briefly, do the mediating effects of parental involvement exist?

2. Method

2.1 Participants

The data were collected from representative samples in the central area of Taiwan. To obtain representative participants, schools were selected from both rural and urban settings. Each student selected was asked to participate in the study by signing a consent form together with his/her parents, the homeroom teacher, and the school principal. A total of 363 eighth grade students participated in the survey questionnaire. The overall sample comprised 190 boys (52.34%) and 173 girls (47.66%), with a mean age of 13.48 years and a standard deviation of 0.88 years.

2.2 Measures

2.2.1 Socioeconomic status

The socioeconomic status was composed of three components: father's educational level, mother's educational level, and family income.

2.2.2 Inventory of parental influence (IPI)

The questionnaire was adapted from the instrument of Inventory of Parental Influence (IPI) developed by Kung (2002). This inventory is a series of instruments designed to identify parents' perceptions of children's school performance and taps different domains of parental involvement.

On the parental attitudes items which tapped the domains of parental pressure and parental psychological support, students were asked to rate the degree of agreement or disagreement with each statement on a five-point Likert scale. The parental practice items which tapped the domains of parental help, resources for intellectual development, monitoring/time management, and parental participation in school were made up of statements that required students to specify how often each practice occurred on a five-point Likert scale. The study also included specific items related to the cultural meaning of parenting in Taiwanese society. The finalized questionnaire consists of 46 items.

2.2.3 Academic achievement

School grades including Chinese, English, Mathematics, Science, History, and Geography were available from the official school records for the end of the semester in which the IPI was administered. In each subject, students were examined with the final examination, and this examination was used by the school to standardize school grades.

2.3 Design

Confirmatory factor analysis and structural equation modeling were utilized in the present study. In order to investigate the conceptual framework of the role of parental involvement we hypothesized for Taiwanese students, the study utilizing maximum likelihood estimation examines the relationships among the factors. A structural equation model-fitting program utilizing the Amos (analysis of moment structure) software package 18.0 was used to conduct the analyses. First of all, confirmatory factor analysis was applied to confirm the six underlying factors of parental involvement of the Taiwanese sample. Second, we investigated the hypothesized model of socioeconomic status and various types of parental involvement in promoting Taiwanese students' school performance.

2.4 Statistical Analysis

For the confirmatory factor analysis, the criteria used for the selection of indicators were as follows: conceptual/theoretical considerations; the factor loadings must exceed .40. The model evaluation criteria (i.e., the index of assessing the extent to which a model fits an analyzed data set) used to test the fit of the models included the chi-square statistic (χ^2), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root-Mean-Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR) and Normed Chi-Square (NC). It should be noted that the χ^2 statistic is sensitive to sample size; therefore, alternative goodness-of-fit indices were used for the present study. Values of .90 and above for CFI and TLI were regarded as indicating a reasonable fit (Schumacker & Lomax, 2015). RMSEA value of 0.05 indicated a close fit and values in the vicinity of .08 indicating a fair fit (Browne & Cudeck, 1993). Hu and Bentler (1999) suggested that a value of .08 and less for SRMR indicated a decent fit.

3. Results

3.1 Confirmatory Factor Analysis

Six factors of parental involvement and allowing the intercorrelations among six factors were determined and were named as *parental pressure*, *parental psychological support*, *parental monitoring*, *resources for intellectual development*, *parental help*, and *parental participation in school*. Eight items related to *parental pressure*, eight items related to *parental psychological support*, six items related to *parental monitoring*, five items related to *academic resources parents provide for children* in order to enhance their intellectual development and school performance, seven items related to *parental help*, and three items related to *parental participation in school* were determined as the underlying factors of parental involvement. The reliability coefficient, utilizing Cronbach's alpha, for the measures are .84, .78, .81, .77, .85, and .72, respectively. All corresponding factor loadings for the latent factors were significant, ranging from moderate to high magnitudes, and those particular items we added relevant to cultural context indeed did load the corresponding factors well.

3.2 Structural Equation Modeling

The study hypothesized that parents' socioeconomic status has effects on various types of parental involvement, in turn, facilitating Taiwanese students' academic achievement. In other words, hypothesized model was evaluated to test whether seven latent factors with students' performance fitted the data well for the Taiwanese sample (see Figure 1).

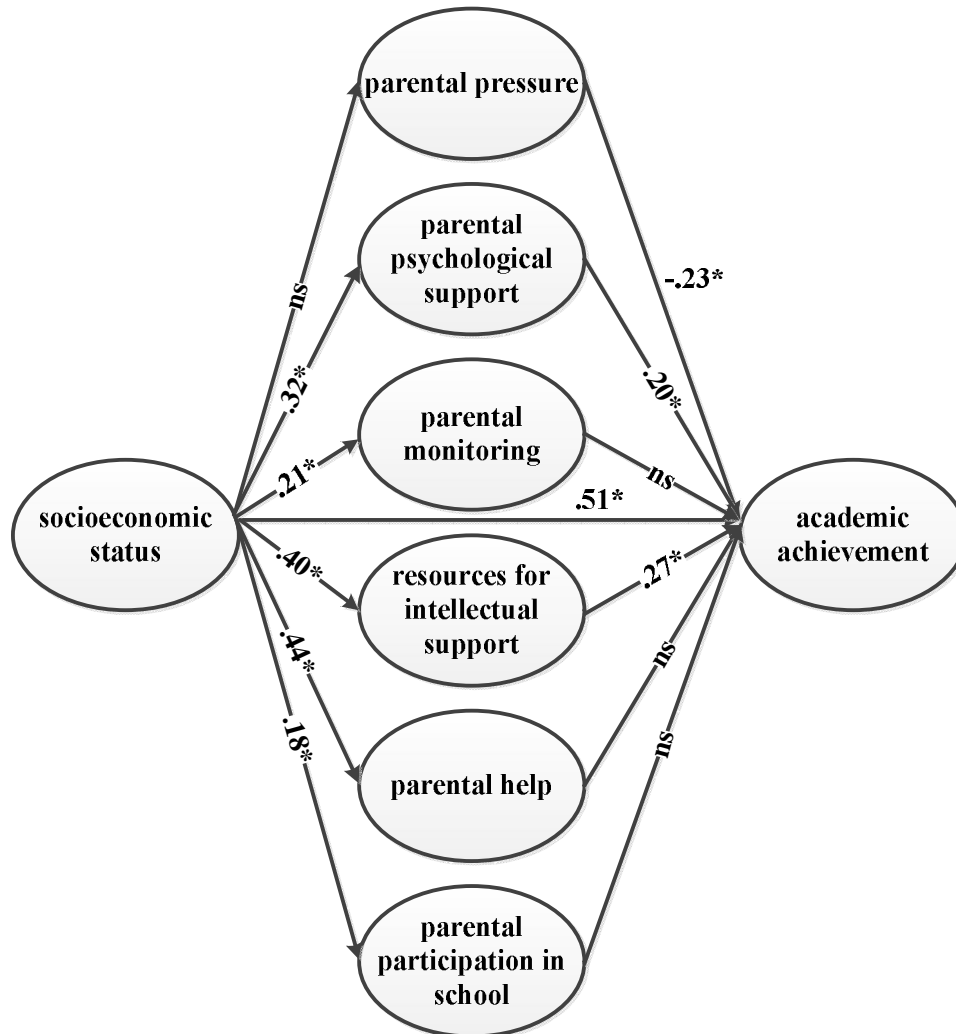


Figure 1: The hypothesized model

Table 1 presented the goodness-of-fit indices of the hypothesized model of parental involvement and the model was accepted and validated for the Taiwanese sample. The statistical results included the χ^2 statistics, CFI, TLI, SRMR, and RMSEA. As shown in Table 1, although the value of the χ^2 statistic indicated poor fit of the model, it was sensitive to sample size and needed to examine alternative indices. The results of these alternative indices indicated a reasonable fit. Table 2 shows parameter estimations of hypothesized mode. Note that all parameter estimates (i. e. corresponding factor loadings) of manifest variables were significant at α -level of .05 and of moderate to high magnitude for the relevant latent factors in hypothesized model. As a result, it indicated that all items in the model were good indicators of their associated factors.

Table 1: Goodness-of-fit indices for hypothesized model

Goodness-of-fit indices	Hypothesized Model	Decision
χ^2	2350.59 (<i>df</i> = 976, <i>p</i> = .00)	Rejected
CFI	.96	Accepted
TLI	.96	Accepted
RMSEA (90% CI)	.065 (.062-.068)	Accepted
SRMR	.05	Accepted

Table 2. Standardized, unstandardized estimate and S. E. for hypothesized model

	Standardized Estimate	Estimate	S.E.
Socioeconomic status			
ses1	.79*	1.00 ^a	—
ses2	.78*	.97	.08
ses3	.58*	.67	.08
Pressure			
P1	.61*	1.00 ^a	—
P2	.58*	.87	.11
P3	.62*	1.05	.13
P4	.58*	.92	.12
P5	.49*	.83	.12
P6	.55*	.96	.13
P7	.53*	.89	.12
P8	.48*	.93	.14
Support			
S1	.80*	1.00 ^a	—
S2	.81*	.91	.06
S3	.66*	.73	.06
S4	.53*	.64	.07
S5	.48*	.73	.09
S6	.60*	.91	.08
S7	.60*	.88	.08
S8	.58*	.82	.08
Monitoring			
M1	.54*	1.00 ^a	—
M2	.67*	1.17	.17
M3	.67*	1.58	.19
M4	.78*	1.86	.21
M5	.72*	1.56	.18
M6	.50*	1.31	.19
Resource			
R1	.57*	1.00 ^a	—
R2	.44*	.59	.09
R3	.62*	1.13	.14
R4	.72*	1.23	.14
R5	.60*	1.02	.13
Help			
H1	.66*	1.00 ^a	—
H2	.78*	1.09	.09
H3	.53*	.81	.10
H4	.64*	1.08	.11
H5	.65*	1.05	.10
H6	.72*	1.17	.11
H7	.75*	1.15	.10
School			
S1	.76*	1.00 ^a	—
S2	.90*	1.00	.09
S3	.57*	.66	.07

Table 2: Standardized, unstandardized estimate and S. E. for hypothesized model (cont.)

	Standardized Estimate	Estimate	S.E.
Achievement			
A1	.91*	1.00 ^a	—
A2	.87*	1.17	.05
A3	.85*	1.41	.06
A4	.93*	1.06	.04
A5	.94*	1.72	.04
A6	.95*	1.14	.04
SES → Pressure	-.07	-.08	.08
SES → Support	.32*	.33	.07
SES → Monitoring	.21*	.17	.06
SES → Resource	.40*	.43	.08
SES → Help	.44*	.54	.09
SES → School	.18*	.29	.11
SES → Achievement	.51*	.857	1.36
Pressure → Achievement	-.23*	-3.51	.84
Support → Achievement	.20*	3.28	.89
Monitoring → Achievement	.10	2.18	1.10
Resource → Achievement	.27*	1.62	.95
Help → Achievement	-.03	-2.61	.83
School → Achievement	-.05	-.96	.55

Note. * $p < .05$.

^a indicates parameters fixed for identification purpose, not estimated.

The results of structural paths in hypothesized model are shown in Table 2 and the path diagram represented in Figure 1. In hypothesized model, the structural paths among parents' SES to the six factors of parental involvement were all significant, except the path leading from SES to the factor of parental pressure. Additionally, parents' SES predicted children's academic achievement directly and indirectly via factors of parental involvement. Moreover, the structural paths leading from the factors of parental pressure, parental psychological support, and resources to students' academic achievement were significant, whereas the paths leading from the factors of parental monitoring, parental help, and participation in school to students' school performance were non-significant. Note that the significant path from parental pressure to students' achievement was negative, but the other two paths were positive. The correlations among six factors of parental involvement, in general, were significant. The direct, indirect, and total effects are summarized in Table 3.

Table 3: Direct, Indirect, and Total Effects on Academic Achievement

	Direct Effect	Indirect Effect	Total Effect
SES	.51*	.17*	.68*
Parental Pressure	-.23*		-.23*
Parental Support	.20*		.20*
Parental Monitoring	.10		.10
Resources	.27*		.27*
Parental Help	-.03		-.03
Participation	-.05		-.05

Note. * $p < .05$.

4. Discussion

Previous research has consistently shown that parental involvement is an important predictor of children's school success (Fan, 2001; Hong & Ho, 2005; Keith et al., 1998; Kung & Lee, 2016). Although theories have argued for differential effects of parental involvement across cultural groups, there is as yet little research in the direction of discovery of the parental involvement construct in Chinese society where students tend to have higher academic achievement in comparison to other national groups. The purpose of the present study is to examine how the family's socioeconomic status and the various types of parental involvement contribute to middle school students' school success in Taiwan. Focusing on the characteristics of parental attitudes and practices, we, as researchers, can possibly utilize them to influence and improve children's education today. Additionally, we hope this study will provide us with a better understanding of why parental involvement is important in school-age children's academic performance and that the results can confirm the multifarious influences which can promote children's academic success.

The present investigation has attempted to achieve the following goals. First, it applies structural equation modeling to explore the construct of parental involvement for Taiwanese children who achieve more school success than other national groups, specifically at middle school age. Second, the study finds a number of possible important links (i.e., paths) from home to schooling that are amenable to intervention, leading possibly to the improvement of educational performance. Third, the study also allows us to explore the various patterns of parental involvement that social classes yield within Taiwanese groups, which are linked to the social and cultural resources parents can provide.

4.1 Taiwanese Parental Involvement in Students' Academic Achievement

The results of Koutsoulis and Campbell's 2001 study indicated that the factor of parental pressure was found to be a negative predictor of academic achievement and parental psychological support was found to positively affect students' achievement. In addition, another study conducted by Kung and Lee (2016), with a sample of seventh grade students in Taiwan, found that parents who had high expectations and provided more resources contributed to their children's academic achievement. Consistent with these findings, the present study also found parental pressure to be a negative predictor of achievement and parental psychological support and expectations to be a significantly positive predictor. In addition, Taiwanese eighth graders indicated that the most effective types of parental involvement in promoting their school performance were parental psychological support and resources parents provided for them (e.g., giving children confidence in their studies, saying things such as "you do such a great job," or nonverbal behaviors such as giving pocket money and presents).

Children in Taiwan agreed that encouragement/psychological support conveyed by parents to children was the best way to enhance children's academic achievement from the attitudinal aspect. However, the perceived pressure Taiwanese students reported in the real scores suggested that too much pressure led to lower academic achievement. This may be because children always sense much more pressure from parents than parents can conceive. Therefore, the sample of students who felt too much pressure from parents did not perform well in school. Another aspect of parental attitudes was considered in the item, "My parents are making sacrifices for my education," which was considered as a variable in parental psychological support. We inferred that the term "making a sacrifice" was a cultural term that was embedded in children's and parents' thinking. Thus, future studies may find it interesting to consider this item separately and discuss this issue in depth.

Concerning practical matters, Taiwanese eighth grade students believed that the most effective way to enhance their school performance was for parents to provide them with resources (e.g., structuring an academic-related home environment). This type of parental involvement was classified as structural/indirect involvement by Chao (2000) and Kung and Lee (2016) in that parents provided more indirect assistance to their children's study.

4.2 The Mediating Effects of Parental Involvement between Socioeconomic Status and Academic Achievement

Past research has consistently found that parents' socioeconomic status influences students' academic achievement (Keith et al., 1998; Long & Pang, 2016). In particular, Ho (1994) argued that parents' SES has indirect effects on children's academic achievement via mediating familial environment.

The finding of the present study contributed to the clarification that parents' socioeconomic status influences children's academic achievement both directly and indirectly via the mediating effects of parental involvement. An interesting finding concerned the only non-significant mediator, that is, that of parental pressure. It was revealed that parents' SES did not affect the amount of pressure they put on their children.

That is, parents from different socioeconomic statuses all had high expectations and stressed the value of academic success. Consequently, the question of why parents' SES did not mediate the factor of parental pressure and subsequently influence children's academic achievement needs to be addressed. We speculate that cultural explanations beyond parents' SES might be more useful in clarifying the results compared to other explanations. Within Chinese culture, parents' SES might become less important, particularly in parental attitudes of expectation and academic pressure because education was valued as the most important task, and all parents maintained certain expectations of, and pressure on, their children's academic success.

The present study contributes to the literature in several ways. First, the study validated the six-factor model of parental involvement and helped contribute to a further understanding of the multidimensional construction of parental involvement. Second, in applying a multidimensional construction, the results showed that encouragement/psychological support was the most effective indicator for children's academic success in Taiwan. Third, the study recognized that Taiwanese parents practiced structural/indirect involvement more than managerial/direct involvement. Fourth, social class does mediate some factors of parental involvement and both directly and indirectly influences children's academic performance. Finally, parental involvement in Taiwan particularly emphasizes home-based involvement in children's education. In conclusion, the main intention of the present study was to find a set of important "modifiable factors" and use those to suggest what parents might do in order to improve their children's academic achievement outcomes and to create a better environment for children's learning.

Acknowledgments

This article was supported by a research project funded by the Taiwan National Science Council. My gratitude goes to the anonymous reviewers for their insightful comments and suggestions. I also would like to express my appreciation to all the participants and people assisted in this study.

References

- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.
- Chao, R. K. (2000). The parenting of immigrant Chinese and European American Mothers: Relations between parenting styles, socialization goals, and parental practices. *Journal of Applied Developmental Psychology, 21*(2), 233-248.
- Chua, A. (2011). *Battle hymn of the tiger mom*. New York, NY: Penguin Books.
- Epstein, J. L. (2013). Ready or not? Preparing future educators for school, family, and community partnerships. *Teaching Education, 24*(2), 115-118. doi:10.1080/10476210.2013.786887
- Fan, X. (2001). Parental involvement and students' academic achievement: A growth modeling analysis. *Journal of Experimental Education, 70*(1), 27-61. doi: 10.1080/00220970109599497
- Foy, P., & Olson, J. F. (2009). *TIMSS 2007 user guide for the international database*. Chestnut Hill: MA: TIMSS & PIRLS International Study Center, Boston College.
- Grolnick, W. S., & Slowiaczek, M. L. (1994). Parents' involvement in children's schooling: A multidimensional conceptualization and motivational model. *Child Development, 65*(1), 237-252. doi: 10.2307/1131378
- Hu, L. T., & Bentler, P. M. (1999). Fit indexes in covariance structural equation modeling. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues and applications* (pp.76-99). Thousand Oaks, CA: Sage.
- Ho, D. Y. F. (1994). Cognitive socialization in Confucian heritage cultures. In P. Greenfield & R. Cocking (Eds.), *Cross-cultural roots of minority child development* (pp. 285-314). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Ho, H.-Z., Chen, W.-W., Tran, C. N., & Ko, C.-T. (2010). Parental involvement in Taiwanese families: Father-mother differences. *Childhood Education, 86*(6), 376-381. doi: 10.1080/00094056.2010.10523173

- Ho, H.-Z., Chen, W.-W., & Kung, H.-Y. (2008). Taiwan. In I. Epstein, & L. Limage (Eds.), *The Greenwood encyclopedia of children's issues worldwide: Asia and Oceania volume* (pp. 439-464). CT, USA: Greenwood Publishing Group.
- Hong, S., & Ho, H.-Z. (2005). Direct and indirect longitudinal effects of parental involvement on student achievement: Second-order latent growth modeling across ethnic groups. *Journal of Educational Psychology, 97*(1), 32-42. doi: 10.1037/0022-0663.97.1.32
- Keith, T. Z., Keith, P. B., Quirk, K. J., Sperduto, J., Santillo, S., & Killings, S. (1998). Longitudinal effects of parent involvement on high school grades: Similarities and differences across gender and ethnic groups. *Journal of School Psychology, 36*, 335-363.
- Koutsoulis, M. K., & Campbell, J. R. (2001). Family processes affect students' motivation, and science and math achievement in Cypriot high schools. *Structural Equation Modeling, 8*(1), 108-127.
- Kung, H.-Y. (2002). *Parental involvement in the academic achievement of middle school students in Taiwan* (Unpublished doctoral dissertation). University of California, Santa Barbara, California.
- Kung, H.-Y., & Lee, C.-Y. (2016). Multidimensionality of parental involvement and children's mathematics achievement in Taiwan: Mediating effect of math self-efficacy. *Learning and Individual Differences, 47*, 266-273. doi:10.1016/j.lindif.2016.02.004
- Long, H., & Pang, W. (2016). Family socioeconomic status, parental expectations, and adolescents' academic achievements: A case of China. *Educational Research and Evaluation, 22*, 5-6, 283-304. doi:10.1080/13803611.2016.1237369
- Mullis, I. V. S., Martin, M. O., Foy, P., & Arora, A. (2012). *TIMSS 2011 international results in mathematics*. Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College.
- Schumacker, R. E., & Lomax, R. G. (2015). *A beginner's guide to structural equation modeling* (4th ed.). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Wong-Lo, M., & Bai, H. (2013). Recommended practices: Cultivating a culturally responsive learning environment for Chinese immigrants and Chinese American students. *Preventing School Failure: Alternative Education for Children and Youth, 57*(1), 17-21. doi: 10.1080/1045988X.2013.731272
- Yue, A. B., & Yang, K. S. (1987). Social-oriented and individual-oriented achievement motivation: A conceptual and empirical analysis. *Bulletin of the Institute of Ethnology (Academic Sinica), 64*, 51-98. (In Chinese, with an English abstract).