

THE AVID ADOLESCENT READER REVISITED: GENDER DIFFERENCES AND THEIR ASSOCIATION WITH FAMILY FACTORS

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As a follow-up study to a cross-sectional national study that established the linkage between gender as well as family factors and the likelihood of being Taiwanese adolescent readers, this study attempted to utilize the same data set with longitudinal data to explore whether the association between family factors and being an avid adolescent readers differs between male and female adolescents. The results of the study suggest that unlike their female counterparts, higher parental education level, richer family cultural environment, and better parental reading modeling might not be as relevant to male adolescents' likelihood of being avid readers: they need support from parent-child literacy interactions along the way as they grow up.

Research conducted in Western countries over the past several decades has noted that female students consistently read more than male students across a wide range of school age groups (Blackwood, Flowers, Rogers, & Staik, 1991; Hall & Coles, 1997; Gambell & Hunter, 2000; Greaney, 1980; Greaney & Hegarty, 1987; Logan & Johnston, 2009; Millard, 1997; Moffitt & Wartella, 1992; Simpson, 1996; Watkins & Edwards, 1992; Whitehead, Capey, & Maddren, 1974). Why do male students read less than girls in English-speaking countries? According to the answers provided by the young people themselves, as collected by interviews from the follow-up of the Children's Reading Choices Project

(2), boys show less interest in reading because of a preference for physical activities, and the influence of image and peer culture (Coles & Hall, 2002). Researchers also offer illuminating explanations of gender difference; in addition to the argument that boys are discriminated against at school and their wider reading practices are rarely taken seriously by language arts teachers in their reading programs (Brozo, 2002; Cavazos-Kottke, 2005; Coles & Hall, 2001; Gambell & Hunter, 2000; Kirsh, et al., 2002; Millard, 1997; Simpson, 1996; St. Jarre, 2008; Taylor, 2005; Worthy, Moorman, & Turner, 1999), some researchers have attributed the gender gap to parents' differential socialization prac-

tices for females and males (Gambell & Hunter, 1999; Gambell & Hunter, 2000; Solsken, 1993).

Historically, literacy has been considered a female activity, associated in the preschool years with mothers reading to their children. In a more recent study, as a prelude to the implementation of the National Curriculum in Britain, Millard (1997) reported that mothers were consistently recorded as the key influence in the early stages of learning to read, but where fathers featured in the accounts it was usually as part of the parental team, rarely alone. Mothers are seen by both sexes as playing a key role in their children's early acquisition of literacy, by organizing events which involve their children's access to books before and beyond the reach of the school. This division of family labor, some researchers have suggested, influences children to reproduce the roles that they experience in the home in their literacy learning (Gambell & Hunter, 1999; Gambell & Hunter, 2000; Solsken, 1993). To be specific, Solsken (1993) maintains that while parents affirm the high value of literacy for their children, regardless of gender, their practices are contradictory and implicate literacy learning in the dynamics of constructing female identity. Drawing on the ethnographic study, her research shows that North American children's perception of reading as a female activity increases over the elementary school years.

Compared with the Western literature, however, little is known about gender and the reading practice of Taiwanese students. Recently, Chen (2008) found that female adolescents are significantly more likely

to be avid adolescent readers than males with cross-sectional national data in secondary-school students from Taiwan. She also found family factors were significantly linked to the likelihood of being avid adolescent readers. This study attempted to disentangle any gender differences in the association between family factors (especially parent-child literacy practices) and the likelihood of being an avid adolescent reader with longitudinal data from the same data set. The author is quite aware that research conducted in a Western culture may not be appropriate for deriving expectations concerning what to find from a study involving a population from an Eastern culture. Nevertheless, the following literature is still valuable for contributing to our initial understanding of the extracurricular reading behaviors and family factors.

Family factors and reading practice

The association between family factors and children's reading practice is well documented in Western literature. Two classical studies have generated insightful findings regarding the importance of family process variables in terms of leisure reading. Neuman (1986) differentiated home-process variables, such as what parents do while interacting with their children, from the more static variables of occupation or economic level, and explored the relation between home environment and leisure reading practice with 254 fifth-graders from the Boston metropolitan area. The researcher found that parental encouragement of reading correlated strongly with children's involvement in reading as a leisure activity (.53), and even after con-

trolling for gender and socioeconomic status, parental encouragement of reading still significantly correlated with leisure reading (.41). When the researcher further analyzed its subcomponents to determine whether one or more factors uniquely contributed to leisure reading, she found the frequency of reading to children when young, reading materials available at home, and encouraging children to read the materials were significantly associated with children's leisure reading, while parental reading habits, after controlling for gender and socioeconomic status, were not.

Greaney and Hegarty (1987) also provided consistent results. In addition to reading achievement and reading attitude, the researchers also included home environmental factors in a series of commonality analyses to assess the contributions of various variables to the book reading of fifth-graders. They found that the amount of time given to book reading correlated more highly with the home process variables (e.g., level of parental interest in reading, extent of encouragement to join a public library, parental reading habits, and frequency of discussions about reading) than with socio-economic status (SES). In other words, from the perspective of developing leisure time reading, what parents do is more important than what they are.

Adolescents' extracurricular reading practice has not received as much attention as that of younger students, however, the factors associated with adolescents' time spent reading have been explored in only a few studies of mother's educational level and parental reading habits. O'Rourke (1979) conducted a study of 300

U.S. ninth graders and their parents and reported that there was no significant relation between parents reading often and their children reading often. Also in the United States, based on data collected from 414 students in five high schools in central Illinois, Moffitt and Wartella (1992) reported that while mother's level of education was significantly related to the likelihood of high-school students' reading, the father's level was not.

Family factors and avid readers

Studies that have centered on avid readers, instead of on the general population, can be traced back to a few studies of kindergarten and elementary-school students. For example, Morrow (1983) developed a composite measurement to identify 396 American kindergarten children who had a high interest (19%) or low interest (25%) in literature. The researcher found significant differences between these two groups of students regarding the following family factors: parental educational level, number of books in the home, parental reading frequency, frequency of being taken to the library, and how often the children were read to at home. Fielding, Wilson, and Anderson (1986) interviewed the eight most-avid readers out of 105 fifth-grade students and their parents. They found that avid readers were read to from the time they were very young, had parents model the uses of reading, and were given freedom of choice about what to read. Shapiro and Whitney (1997) compared 21 avid readers and 18 non-avid readers out of 55 fifth and 57 fourth graders. They found four home factors to be significantly related to leisure reading,

including: receiving books as gifts, being taken to the library, the age at which parents stopped reading to/with them, and whether someone at home encouraged them to read. For older children and teens, Strommen and Mates (2004) distinguished “readers” as those for whom reading is an important and recreational activity and a consistent part of everyday life, from “not-readers,” those who seldom or never choose to read for pleasure. With interview data from 151 sixth and ninth grade readers, researchers found that one characteristic of readers is that their parents or other family members prioritize reading as a leisure activity.

Family factors and reading for Taiwanese students

Utilizing data from the Progress in International Reading Literacy Study (PIRLS) 2006 with 4,589 fourth graders, Chen and Ko (2009) explored the influence of gender and family factors on Taiwanese students’ reading practice, reading attitude and reading attainment. For reading practice, with hierarchical regression, they found that in additions to gender and parental educational level, reading resources at home, and parental reading attitudes, early home literacy activities (e.g. the activities parents regularly engaged in with the child prior to entry into primary school: reading books, telling stories, singing songs, playing with alphabet toys, playing word games, and reading signs and labels aloud) significantly entered the equation to predict the frequency of reading both literary texts and informational texts.. Furthermore, in next step, in addition to gender, parental educational level, read-

ing resources at home, parental reading attitude, and early home literacy activities, current home literacy activities (e.g. the activities parents engage in with the child: listening to children reading aloud, talking with children about reading on his/her own, going to the library or a bookstore together, and so on) also significantly entered the equation to predict the reading frequency of the Taiwanese fourth graders.

For adolescents, utilizing national survey data collected in 2003 from the Taiwan Educational Panel Survey (TEPS) for secondary analyses, Chen (2008) classified 2,909 out of 10,404 (27%) ninth graders and 2,680 out of 10,651 (25.5%) twelfth graders that reported reading many extracurricular books during the previous summer vacation as avid adolescent readers and investigated factors associated with such readers in Taiwan. Using logistic regression analyses, the study was the first to identify gender as a significant predictor for the likelihood of being an avid reader. Moreover, the study found that, for ninth graders, family factors, which range from being weakly to strongly linked to the likelihood of being an avid reader, were: cultural level of the home environment (Chinese magazines, English magazines, and/or an encyclopedia at home), parental educational level, parental bookstore visit frequency, and parental reading frequency, respectively, when all the factors were taken into consideration. For twelfth graders, family factors, ranging from weakly to strongly linked, were: parental educational level, the cultural level of the home environment, parental reading frequency, and parental bookstore visit frequency, respectively. In words, in addi-

tion to the factor of gender, parental reading modeling was found to have a relatively greater effect on children being avid adolescent readers than parental educational level and the cultural level of the home environment.

The present study

Even though some previous Western studies posited that differential parental socialization practices for females and males had something to do with the gender gap in reading practices, empirical evidence is rather limited. In an ethnographic study, Solsken (1993) that showed children's perceptions of reading as a female activity increases over the elementary school years. On the other hand, from previous studies on family factors and reading practice, we have learned that, in addition to reading materials at home and parental reading habits, reading to children when young, encouraging children to join a public library, and discussing about reading with children were also significantly associated with fifth graders' reading practice (Greaney & Hegarty, 1987; Neuman, 1986). From studies on family factors and avid readers, we have learned that, in addition to parental educational level, reading materials at home, and parental reading habits, parent-child interaction factors, such as how often the children were read, the age at which parents stopped reading to/with them, and how often being taken to the library, are also closely associated with being a young avid reader (Fielding, Wilson, & Anderson, 1986; Morrow, 1983; Shapiro and Whitney, 1997; Strommen and Mates, 2004). From a study on family factors and Taiwanese fourth graders' reading

practice, we have learned that, in addition to parental educational level, reading resources at home, and parental reading attitude, parent-child literacy interactions both when the children were young and when the children were at the fourth grade, were also found to be significant predictors for the reading practice (Chen & Ko, 2009). As a follow-up study of a cross-sectional national study that established the linkage between gender as well as family factors (parental educational level, cultural level at home, parental reading frequency, and parental bookstore visit) and the likelihood of being Taiwanese adolescent readers (Chen, 2008), using the same data set with longitudinal data, the purpose of this study was twofold: to investigate, in addition to parental educational level, cultural level at home, and parental reading frequency, do parent-child literacy interactions at children's various developmental stages (e. g. the frequency of shared reading and playing by respondents and their parents before entered elementary schools; the frequency of going to the bookstore, book fair or exhibition together when were in elementary school; and the frequency of going to the bookstore, book fair or exhibition together when were in junior high school) help predict the likelihood of being an avid reader. Moreover, this study attempted to explore whether the association between family factors and being an avid adolescent readers differs between male and female adolescents, especially those parent-child literacy interaction factors. To be specific, is there gender difference in the frequency of shared reading and playing by respondents and their parents before enter-

ing elementary schools? is there gender difference in the frequency of going to the bookstore, book fair or exhibition together when in elementary school? and again when in junior high schools? Furthermore, do different patterns exist in the ways family factors (e.g. parental educational level, cultural level of the home environment, parental reading frequency, and the three parents-child literacy interaction practices during the various developmental stages as mentioned above) help predict the likelihood of being a male avid adolescent reader and of being a female avid adolescent reader?

Method

The Taiwan Educational Panel Survey (TEPS) is a multistage, stratified sample survey of Taiwanese high-school students, jointly supported by the Academia Sinica, the Ministry of Education, the National Academy for Educational Research, and the National Science Council in Taiwan (Chang, 2003). Using clustered, multistage, stratified probability sampling, high schools in Taiwan were classified according to geographical location, metropolitan/rural area, and public/private school. Then, within each school, four classes were selected, and, within each class, 15 students were selected (Yang, Tam, & Huang, 2003). The project began in 2001, and four waves of surveys had been administered as of the end of 2006. National data set of the first wave used in this study was collected in 2001, when the subjects were in the seventh grade of junior high school, with 20,055 original respondents. This sample was surveyed again in 2003, as the second wave, when respon-

dents were in ninth grade, with 19,088 retained. Then, around 4,000 were followed in 2005 when they became eleventh graders in senior high school, as the third wave Core Panel (Tam, 2004). Questions related to the family literacy were only asked in the first and the third wave surveys, thus for the purpose of this study, data were drawn from the Core Panel of these two waves. Because questionnaires from both students and their parents were used in this study, the valid N was 2,954. Among them, 1,469 were male and 1,485 were female.

In the student questionnaires, respondents in eleventh grade from the third wave were asked what kinds of activities they had been involved in during the summer vacation following junior high school graduation. Respondents were allowed to choose more than one activity from the following list: working part time, sports, community service, reading a lot of extracurricular books, and spending time on the Internet/PC. Those who reported reading a lot of extracurricular books were classified as avid readers for the purposes of this study.

For the independent variables, family factors selected for investigation included father's and mother's educational level (with 1 = junior high or lower, 2 = senior high, and 3 = college or higher); Chinese magazines, English magazines, and encyclopedias at home (1 = yes); father's and mother's reading frequency (1 = never, 2 = seldom, 3 = sometimes, and 4 = often); and frequency of shared reading and playing by respondents and their parents before respondents entered elementary school; frequency of respondents and their parents

going to the bookstore, book fair, or exhibition together when the respondents were in elementary school; and frequency of respondents and their parents going to the bookstore, book fair, or exhibition together when the respondents were in junior high school (1 = never, 2 = seldom, 3 = sometimes, and 4 = often). While in the field of education, access to print at home is often investigated by asking about how many books are available in the home, in this study, the concept of the cultural level of the home environment developed by researchers from the field of cultural study (e.g. van Schooten, Oostdam, & de Gloppeper's, 2001) was utilized instead by asking whether there were Chinese magazines, English magazines, or encyclopedias at home. Also, in this survey (TEPS), parent-child literacy-related interaction before entering elementary school used only one survey question: shared reading, while the concept of parent-child literacy-related interaction in elementary and in junior high was operationalized as parents and children going to the bookstore/book fair together. Among these independent variables, two of them were drawn from the parental questionnaire of the third wave: the frequency of shared reading and playing by respondents and their parents before they entered elementary school, and the frequency of respondents and their parents going to the bookstore, book fair, or exhibition together when they were in junior high school. All other independent variables were drawn from the parental questionnaire of the first wave.

Results

Of the student respondents, 543 out of 1,469 (37%) males and 727 out of 1,485 (49%) females reported reading a lot of extracurricular books during the summer vacation following junior high school graduation and were therefore classified as avid adolescent readers for the present study. Gender differences were found for the likelihood of being an avid adolescent reader, as indicated by Chi-square analysis (Chi-square = 43.33, $p < .001$). Gender differences were also found for two of the family factors that represented parent-child literacy interactions at various stages, as indicated by t tests: going to the bookstore, book fair, or exhibition together during elementary school ($p < .01$) and going to the bookstore, book fair, or exhibition together during the junior high school ($p < .001$), as shown in Table 1. To be specific, parents of female respondents reported a significantly higher frequency of going to the bookstore, book fair or exhibition with the respondent when they were in elementary school than parents of male respondents. Similarly, parents of female respondents reported a significantly higher frequency of going to the bookstore, book fair, or exhibition with the respondent when they were in junior high school than parents of male respondents. No gender difference was found for shared reading before elementary school, as indicated by parents of female respondents and parents of male respondents.

Table 1 T-test table

Variable	Gender	Mean	Std	t-value
Shared reading before elementary school	Female	2.72	0.94	-0.832
	Male	2.75	0.93	
Going to the bookstore together during elementary school	Female	2.50	0.83	3.132**
	Male	2.41	0.81	
Going to the bookstore together during junior high school	Female	2.17	0.80	3.885***
	Male	2.06	0.76	

*p<.05 **p<.01 ***p<.001

To investigate the association between family factors and the likelihood of being an avid reader and then to examine whether the association differed between male and female adolescents, we performed the statistical analysis first with all adolescents, and then split the full sample by gender and proceeded with the analyses within each group, as shown in Table 2. In the first set of the logistic regression analysis, for all adolescents, in Model 1, among gender, father's educational level, mother's educational level, the three dimensions of the cultural level of the home environment, father's reading frequency, and mother's reading frequency, six variables were found to be significant predictors of the likelihood of being avid adolescent readers: gender, father's educational level, Chinese magazines at home, English magazines at home, encyclopedia at home, and mother's reading frequency. Gender and mother's reading frequency had a relatively greater effect than the other four family factors. However, when we added parent-child literacy interaction factors at the three stages into Model 2, we found that in addition to gender, father's educational level, English magazines at home, encyclopedia

at home, and mother's reading frequency, two of the three interaction factors also significantly entered the equation to predict the likelihood of being avid adolescent readers: parents and their children going to the bookstore together during elementary school and going to the bookstore together during junior high school. The factor of shared reading by the parents and their children before the children entered the elementary school was not found to be a significant predictor. It is interesting to note that having Chinese magazines at home did not significantly enter the equation as it did in Model 1, and English magazines at home, encyclopedia at home, and mother's reading frequency all entered the equation with a smaller effect than the same variables in previous model.

Table 2 Logistic Regression Analysis of the likelihood of being avid adolescent readers, male avid adolescent readers, and female avid adolescent readers

	All adolescents		Male adolescents		Female adolescents	
	Model 1 Odds ratio	Model 2 Odds ratio	Model 1 Odds ratio	Model 2 Odds ratio	Model 1 Odds ratio	Model 2 Odds ratio
Gender						
[Male]						
Female	1.710***	1.660***				
Father's educational level	1.189*	1.174*	1.154	1.124	1.231*	1.231*
Mother's educational level	1.069	1.041	1.146	1.090	1.000	1.002
Chinese magazines at home						
[no]						
Yes	1.243*	1.143	1.127	1.020	1.362*	1.321*
English magazines at home						
[no]						
Yes	1.384**	1.313*	1.458*	1.327	1.310*	1.287
Encyclopedia at home						
[no]						
Yes	1.335**	1.237*	1.194	1.004	1.483*	1.453*
Father's reading frequency	1.079	1.047	1.103	1.067	1.060	1.038
Mother's reading frequency	1.237***	1.163*	1.209*	1.116	1.254*	1.212*
Shared reading before						
elementary school		1.061		1.206*		0.948
Going to the bookstore						
together during elementary						
school		1.208**		1.278*		1.153
Going to the bookstore						
together during junior high						
school		1.200*		1.410***		1.050
Chi-Square of Omnibus	195.758***	221.385***	65.602***	109.909***	95.759***	95.203***
Tests						
Hosmer and Lemeshow	4.284	3.730	9.037	3.313	6.657	9.399
(Goodness of fit)Test						
N	2561	2526	1267	1251	1294	1275

*p < .05 **p < .01 ***p < .001

In the second set of logistic regression analyses shown in Table 2, for male adolescents, in Model 1, among parental educational levels, the three dimensions of the cultural level of the home environment, and parental reading frequencies, only English magazines at home and mother's reading frequency significantly predicted the likelihood of being an avid adolescent reader. Furthermore, when we added parent-child literacy interaction factors at the three stages into Model 2, English magazines at home and mother's reading frequency turned out to be non-significant; instead, shared reading before elementary school, parents and children going to the bookstore together at during elementary school, and during junior high school were all found to be significant predictors for the likelihood of being an avid adolescent reader. Among these three interaction factors, going to the bookstore together during junior high school was the strongest predictor. To be specific, odd ratios showed that male adolescents whose parents reported taking them to the bookstore, book fair, or exhibition more frequently when they were in junior high school were about 1.410 times more likely to be avid readers than male adolescents whose parents reported taking them to these places less frequently when they were in junior high school. Similarly, odd ratios showed that male adolescents whose parents reported taking them to the bookstore, book fair, or exhibition more frequently when they were in elementary school were about 1.278 times more likely to be avid readers than male adolescents whose parents reported taking them to these places less frequently during that time. Lastly, odd ratios

showed that male adolescents whose parents reported engaging in shared reading and playing more frequently before they entered elementary school were about 1.206 times more likely to be avid readers than male adolescents whose parents reported doing so less frequently before they entered elementary school. Overall, among the various aspects of the family factors, what parents do with their children at different stages, rather than who parents are and what parents do by themselves, were found to be significantly linked to the likelihood of being avid readers for male adolescents in Taiwan.

For the female subsample, family factors were linked to the likelihood of being an avid adolescent reader in a somewhat different pattern. In the third set of logistic regression analyses of Table 2, for female adolescents, in Model 1, father's educational level, all three factors of the cultural level of the home environment, and mother's reading frequency were found to be significant predictors of the likelihood of being an avid adolescent reader. When we added three interaction factors into Model 2, four out of the five predictors remained significant, and none of the literacy interaction factors successfully entered the equation. Specifically, odd ratios showed that female adolescents whose fathers reported having a higher educational level were 1.231 times more likely to be avid readers than female adolescents whose fathers reported having a lower educational level. Female students whose parents reported having Chinese magazines at home were 1.321 times more likely to be avid readers than female students whose parents reported not having

those at home. Female students whose parents reported having encyclopedia at home were 1.453 times more likely to be avid readers than female students whose parents reported not having those at home. Finally, female students whose mothers reported reading books more frequently were 1.212 times more likely to be avid readers than female students whose parents reported reading books less frequently. Overall, among various aspects of the family factors, who parents are and what parents do by themselves, rather than what parents do with their children at different stages, were found to be significantly linked to the likelihood of being avid readers for the female adolescents in Taiwan.

Discussion

Approximately one out of three (37%) male adolescents and one out of two (49%) female adolescents in Taiwan were categorized as avid readers in this study, because they reported reading a lot of extracurricular books in the summer vacation prior to eleventh grade. These findings were somewhat higher than the 27% of adolescents in Taiwan who reported reading a lot of extracurricular books in the summer vacation prior to ninth grade, as found in the previous study using the same data set from the TEPS (Chen, 2008). A reasonable explanation would be that secondary-school students in Taiwan had more leisure time during the summer vacation prior to eleventh grade than during the summer vacations prior to ninth grade, when they were supposed to spend a lot of time preparing for senior-high-school entrance examination. In addition, consistent with the previous study, this study found that

female students are more likely to be avid adolescent readers than male students. More importantly, with longitudinal data, it is very interesting to find that, while there is no gender difference in the frequency of shared reading and playing by respondents and their parents before entering elementary schools, gender difference was found in the frequency of going to the bookstore, book fair or exhibition together when the respondents were in elementary school ($p < .01$), and also found for later when respondents were in junior high school ($p < .001$). To be specific, while parent-child literacy-related interactions decreased as Taiwanese children grow older for both sexes, there is a general tendency for males to decrease to a greater extent than females, as shown in Table 1. These findings seem to partially supported the results of Solsken (1993) who found that parents' differential literacy socialization practices for females and males increase over the elementary school years. However, more future research is needed to investigate whether there are other explanations behind this phenomenon.

In the previous study, Chen (2008) found that what parents do (parental reading frequency, parental bookstore visit frequency) has a relatively greater effect on adolescents' being avid readers than who parents are (parental educational level, cultural level of home literacy). In the present study, when we also considered factors regarding what parents do with their children at different stages (shared reading before the children entered the elementary school, going to the bookstore together when the children were in elementary school and when the children were in junior

high school), we found what parents do with their children has a relatively greater effect on being avid adolescent readers than who the parents are and what parents do by themselves. One unique contribution of this study is that the regression analysis detected distinct gender differences in the association between family factors and the likelihood of being an avid adolescent reader. It is somewhat surprising that when we took into account who the parents are, what the parents do by themselves, and what the parents do with their children at various stages, only what the parents do with their children at three stages were found to help predict male adolescents being avid readers. In contrast, who parents are and what parents do by themselves were found to help predict female adolescents being avid readers, in spite of the fact that female students were found to go to the bookstore with their parents more frequently than their male counterparts. In other words, regarding the question of who is an avid adolescent reader in Taiwan, as far as family factors are concerned, family SES and maternal modeling alone are sufficient for girls to take up books, but boys must be accompanied to get them to read. Some extant literature has differentiated home-process variables from the more static variables and indicated that home-process variables have relatively greater impact upon children's reading practices (e.g. Greaney & Hegarty, 1987; Neuman, 1986; Chen, 2008), but this study is the first to address the importance of taking gender into consideration upon investigation of the relationships between family factors and children's reading practices. In addition, Shapiro and

Whitney (1997) have identified the age at which parents stop reading to/with the children as one of the factors significantly related to the differentiation between being an avid fourth/fifth grade reader and being a non-avid reader, yet the findings of this study suggested that gender might play an important role here.

Regarding the educational implications, in response to the gender gap on reading practice, many researchers and educators have highlighted the importance of taking both sexes' reading interests into account and have suggested that schools and teachers offer students more choices in reading materials (Brozo, 2002; Cavazos-Kottke, 2005; Coles & Hall, 2001; Millard, 1997; Smith & Wilhelm, 2002; St. Jarre, 2008; Taylor, 2005; Worthy, 1998; Worthy, Moorman, & Turner, 1999). While they have emphasized the roles of the school and the teacher, the findings of this present study add the role of family literacy to fostering male students' reading motivation. The results of this study suggested that, unlike their female counterparts, higher parental educational level, richer family cultural environment, and better parental reading modeling might not be as relevant to male adolescents' likelihood of being avid readers: they need support from parent-child literacy interactions along the way as they grow up. Going to the bookstore with their parents when they are in junior high school, going to the bookstore with their parents when they are a little younger in elementary school, and even shared reading experience with their parents before entering the elementary school seemed to help increase male adolescents' likelihood of reading a lot of extracurricular books in

the summer vacation prior to eleventh grade. Furthermore, being the strongest predictor for male adolescents' likelihood of being avid readers, the factor of going to the bookstore together during junior high school indicates an important educational implication to parents: It is important to sustain the experience of literacy interaction with their male children even when they grow into adolescence. The gender differences found in the present study may have a basis in the evolutionary theoretical perspective, that is boys demand more attention than girls do (Maccoby & Jacklin, 1974); thus parents may respond by performing more activities with them, such as reading to them, or taking them to bookstores.

To conclude, as a follow-up to Chen's (2008) study, this study found that parents and family factors exert different patterns of influence upon male and female avid adolescent readers. While who parents are and what parents do have relatively greater effects on being avid readers for female adolescents, what parents do with their children has a greater impact on male adolescents. As a secondary analysis, this study is limited because of its instrument. For example, there might be better indicators for the variables of parent-child literacy interactions at different stages than shared reading before elementary school, and going to the bookstore together during elementary and junior high school. Nevertheless, this study advances the literature by pointing out probable gender differences in the association between family factors and the likelihood of being avid adolescent readers. Whether these gender differences prevail across cultures invites

future investigations.

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