AFTER-SCHOOL TIME USE IN TAIWAN: EFFECTS ON EDUCATIONAL ACHIEVEMENT AND WELL-BEING

Su Yen Chen and Luo Lu

ABSTRACT

Western studies have linked adolescents' time spent on homework, structured activities, various kinds of leisure involvement, and part-time employment with their academic achievement and psychological adjustment, but little is known about the after-school pursuits of Chinese students and their associations with adolescents' development. Using a nationally representative sample in Taiwan, this study investigated how time spent on nine after-school activities during the eleventh grade helped predict educational achievement and depression symptoms during the twelfth grade, in addition to previous achievement and depression level and background variables. The findings of this study confirmed and extended the extant literature that time spent on homework, after-class academic-enrichment programs, and private cram schools positively affected adolescents' educational achievement; however, time spent on private cram schools was negatively associated with their psychological well-being. In addition, inconsistent with the findings of many Western studies, this study's results did not support a positive effect of participating in school-based extracurricular activities on educational achievement and psychological well-being. Finally, time spent on working part-time and watching TV was found to be detrimental to achievement, but time spent playing Internet games appeared to be negatively associated with depression symptoms.

Time can be spent in different ways, and time use reflects priorities and predilections, opportunities, and constraints (Medrich et al., 1982). In a study on how adolescents spend time across the world, Larson and Verma (1999) indicated that adolescents in East Asia spend much more time on schoolwork outside of class than their counterparts in the United States; and in contrast, participation in structured extracurricular activities and part-time employment are more common in

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the West than in the East. Western researchers have long been inter-
ested in how adolescents use their after-school time and its overall
effect on their development. Many studies have linked adolescents’
time spent on homework, structured extracurricular activities, various
kinds of leisure involvement, and part-time employment with both
their educational achievement and psychological adjustment. How-
ever, very little information is available on Chinese students’ after-
school time pursuits and their associations with academic achievement
and psychological well-being. Drawing upon the Western literature
and a few studies on East Asian students as references, and utilizing
data from a national survey of adolescents in Taiwan, this study ex-
plored the relationships of time spent on nine after-school activities
(i.e., homework, academic-enrichment programs, private cram schools,
school-based extracurricular activities, watching TV, sports, extracur-
ricular reading, Internet games, and part-time employment) to senior
high school students’ educational achievement and well-being.

After-School Time Use and Academic Achievement

Several studies have examined American adolescents’ overall after-
school time use and academic achievement. Camp (1990) utilized data
from High School and Beyond 1980 (HSB) and found time spent on
doing homework and participating in a series of extracurricular and
co-curricular activities, both measured in 1982 when the students were
seniors, produced positive, significant effects on academic achievement
measured in 1984, when the students were no longer in high school.
Yet, time spent watching TV per day and working per week did not.
Cooper et al. (1999) surveyed 421 students in Grades 6 through 12
from the state of Tennessee and found that spending more time on
school-based extracurricular activities and other structured groups
outside of school, and less time on working at jobs and viewing televi-
sion, were associated with both higher standardized achievement test
scores and class grades. Spending more time on homework was associ-
ated with better class grades. Jordan and Nettles (2000) utilized data
from the National Educational Longitudinal Study of 1988 (NELS: 88)
and found participation in structured activities and time spent alone
(e.g., using personal computers, reading for pleasure, working on hobb-
ies) during tenth grade appeared to have significantly positive effects
on twelfth-grade composite mathematics and science achievement. In
contrast, working for pay during the tenth grade had significantly neg-
ative effects on twelfth-grade math and science achievement. Schreiber
and Chambers (2002) also used data from the NELS: 88 and catego-
rized student pursuits as in- or out-of-school, academic or nonaca-
ademic, and organized or unorganized activities. The researchers found engagement in in-school, academic, organized activities; out-of-school, nonacademic, non-organized activities (e.g., time spent on using personal computers, reading for pleasure), and out-of-school, academic, non-organized activities (e.g., homework) were all positively and significantly related to tenth graders' achievement across four subject areas: mathematics, reading, science, and geography/history. In contrast, engagement in out-of-school, nonacademic, non-organized activity (television), was negatively and significantly associated with tenth graders' mathematics and science achievement, but positively and significantly related to their geography/history achievement.

Finally, Fuligni and Stevenson (1995) conducted a comparative study of after-school time use of eleventh graders across three countries. They found that among American students, time spent on studying and on extracurricular activities were positively correlated with mathematics scores, but time spent on working and watching TV was negatively related. For Taiwanese students, time spent on studying and on taking lessons from cram schools was positively correlated with mathematics scores, but time spent on reading for pleasure, working, and watching TV was negatively related. And for Japanese students, time spent on studying was positively correlated with mathematics scores, but time spent on working and watching TV was negatively linked. In other words, these after-school time use studies showed that time spent on homework, structured activities, and being alone using computers or reading appeared to improve adolescents' academic achievement, while for time spent watching TV and working part-time, the results were relatively inconclusive.

In addition to the above research, many studies have examined the relationship of an individual after-school activity to adolescents' academic achievement, and most have suggested similar conclusions. Among various after-school activities, the effect of homework has been the most widely investigated. In a recent study, Cooper, Robinson, and Patall (2006) reviewed hundreds of studies conducted in the United States since 1987 and indicated that there was generally consistent evidence for a positive influence of homework on achievement, especially for grades 7-12. Extracurricular activity also has been widely examined. Feldman and Matjasko (2005) reviewed contemporary literature on the relationships between school-based extracurricular activities and adolescent development, and revealed that the associations between structured extracurricular activities and educational achievement were mostly positive. While some researchers have proposed that television viewing is associated with lower academic achievement be-
cause it displaces more academically oriented activities, Cooper et al. (1999) suggested that the results of empirical studies on the relationship between watching TV and achievement have been relatively inconsistent. Similarly, the empirical record for the linkage between part-time employment and educational achievement has been mixed, but a few studies have suggested that long hours of weekly employment during the school year decrease adolescents’ academic performance (Steinberg & Cauffman, 1995; Weller et al., 2003).

Finally, the relationship between time spent online and academic achievement has begun to attract research attention. Hunley et al. (2005) investigated the relationship between adolescent computer use and academic achievement with data from 101 tenth graders in southwestern Ohio. They found that the correlation between total computer use with the Internet and grade point average was not significant, nor was the correlation between playing Internet games, a computer activity on which adolescents spent the most time, and grade point average.

To summarize, the positive impact of time spent on homework and structured extracurricular activities upon educational achievement has been well recognized. At the same time, the relationship between watching TV and part-time employment to adolescents’ educational achievement has been conclusive. The existing literature has suggested a positive association between overall time spent alone on non-academic, non-organized activities (e.g., time spent using personal computers, reading for pleasure, talking on the phone) and academic performance; nevertheless, the correlations between time spent on the Internet and academic achievement, and time spent playing Internet games and academic achievement, have been found to be nonsignificant.

After-School Time Use and Psychological Well-Being

Even though a positive linkage between time spent on homework and educational achievement has been well established, there is a great need for an empirical study to clarify the relationship between the degree of after-school academic engagement and adolescents’ psychological well-being. A number of studies have found higher rates of depression and other signs of distress among East Asian students as compared to their counterparts in other countries (Fugita & Crittenden, 1990; Hynes & Akiyama, 1990), but Stevenson and Stigler (1992) argued that East Asian students’ devotion to schoolwork is a cultural norm and does not necessarily generate more distress than schoolwork does to adolescents in Western countries. Regarding time spent on
structured activities, research has substantiated that the amount of time adolescents spend in school-based, structured extracurricular activities has a positive impact not only on students' educational achievement, but on their psychological adjustment, according to Feldman and Matjasko's review (2005). Regarding part-time employment, several studies have found that working adolescents were notably more depressed (Largie et al., 2001; Shanahan et al., 1991; Steinberg & Dornbusch, 1991).

Finally, regarding time spent alone on nonacademic, non-organized activities, McHale, Crouter, and Tucker (2001) assessed links between free-time activities (e.g., hobbies, sports, reading, television viewing, hanging out) in middle childhood and adjustment with data from 198 American children, and found that time spent on sports activities at age 10 to be positively and significantly correlated with grades and negatively and significantly correlated with depression at age 12, while they found time spent reading at age 10 to be positively and significantly correlated with both grades and depression at age 12. It is interesting to note that when Csikszentmihalyi and Hunter (2003) investigated the relationship between 10 frequent activities and happiness with data from a national sample of American youth, they also reported that time spent reading/writing for fun was a significantly negative predictor of happiness. As for Internet use and psychological well-being, some research has proposed that greater use of the Internet is associated with a decline in adolescents' well-being (Kraut et al., 1998); but other research has not found a link between these two variables (Subrahmanyam & Lin, 2007; Wastlund, Norlander, & Archer, 2001).

In Sum, of the various kinds of after-school activities, time spent on school-based extracurricular activities generally has been found to have a positive impact on adolescents' psychological development, while time spent on part-time employment has been found to be negatively related to adolescents' well-being. The associations between after-school academic engagement and well-being or nonacademic, non-organized activities involvement and well-being appeared to be inconclusive.

The Present Study

From prior research, we have learned that time spent on homework has academic benefits for adolescents, but it is unclear whether there is a psychological payoff as the number of hours per week devoted to schoolwork increases. In addition to spending time on homework, many Taiwanese adolescents also participated in after-class, academic-
enrichment programs provided by their schools, and attended classes provided by private cram schools to prepare for college entrance examinations. How time invested in these after-school, academic-oriented activities relate to adolescents’ educational achievement, and more importantly, to their psychological well-being, is one of the major concerns of the present study. Second, Western studies have provided plenty of empirical evidence on the impact of participating in school-based extracurricular activities and working part-time upon academic achievement and psychological adjustment, but little is known in this area for the Chinese students. Is spending more time on structured activities correlated with better educational achievement and lower levels of depression for Taiwanese senior high school students, like their American counterparts? And, similarly, is more time spent on part-time employment correlated with lower educational achievement and higher levels of depression for Taiwanese adolescents, as some Western studies have suggested? Finally, previous studies indicate that involvement in some of the non-organized leisure activities also affects adolescents’ development. Taken together, with educational achievement and depression level of eleventh graders and background variables controlled, the present study explores how time spent on homework, academic-enrichment programs, private cram schools, school-based extracurricular activities, TV, sports, extracurricular reading, Internet games, and part-time employment in the eleventh grade helped account for the variance of educational achievement in the twelfth grade on one side, and for the variance of depression level in the twelfth grade on the other.

METHOD

Sample and Data Collection

The Taiwan Educational Panel Survey (TEPS) is a multistage, stratified sample survey of Taiwanese high school students, jointly supported by Academia Sinica, the Ministry of Education, the National Academy for Educational Research, and the National Science Council in Taiwan (Chang, 2003). By using clustered, multistage, stratified probability sampling, high schools in Taiwan were classified according to geographical location, metropolitan/rural area, and public/private. Then, within each school, four classes were selected, and, within each class, 15 students were selected. The national data set used in this study was collected in 2005 as the third wave, and its follow-up was collected in 2006 as the fourth wave. The sample included 11,061 elev-
enth graders surveyed from 260 senior high schools classified according to geographical location, metropolitan/rural area, and school type. Then, this sample was surveyed again the next year, and 10,614 twelfth graders were retained. Because both students' and their parents' questionnaires were used in this study, the valid N was 10,347. Among them, 5,129 (49.5%) were male.

For the purpose of this study, data regarding students' background information, daily engagement, weekly engagement, and depression symptoms, which served as an indicator of psychological well-being, were drawn from the student questionnaires. In addition, students completed a series of ability tests, and the composite test score served as the students' educational achievement in this study. Their parents' background information was drawn from the parent questionnaire.

**Measures**

**Educational achievement.** A dependent variable in this study, educational achievement, was measured by four curriculum-free ability subtests: an analytical ability subtest, a mathematical ability subtest, a language ability subtest, and a science ability subtest (Yang, Tam, & Huang, 2003). The four scores were combined into a composite, with higher scores signifying better educational achievement. The students were asked to complete a series of subtests in the eleventh grade and to complete another series of subtests in the twelfth grade.

**Depression symptoms.** The other dependent variable in this study, depression symptoms, was measured by a sum score of 15 items (for example, depressed mood, loneliness, feeling helpless, insomnia, headache, feeling numb or punctured in certain parts of the body) using a 4-point scale, with high scores signifying more depression symptoms. These items were drawn from various established depression scales such as CES-D and BDI, mainly tapping the common affective and physical aspects of depression symptoms. Cronbach's α of reliabilities for this sample were .90 and .92 for eleventh and twelfth graders, respectively.

**After-school time use.** The eleventh graders were asked to report how many hours they spent doing homework and watching TV or videos on a daily basis; how many hours they spent each day attending after-class, academic-enrichment programs provided by their schools, attending classes provided by private cram schools, participating in school-based extracurricular activities, playing Internet games, doing extracurricular reading in literature, history, biography, philosophy, politics, economics, technology or information science; and, on a weekly basis, how much time they spent working part-time and how many times they engaged in sports activities.
Data Analyses

First, Pearson correlation was conducted. Then, to examine the incremental value of time spent on the nine after-school activities during eleventh grade on educational achievement and depression level in twelfth grade, beyond previous level of dependent variables and background variables, two hierarchical regression analyses were performed. For educational achievement in the twelfth grade, educational achievement in the eleventh grade was entered at the first step as baseline, followed by background variables of gender, father’s educational level, mother’s educational level, and family income as the second set, and time spent on the nine after-school activities during the eleventh grade as the third set. Finally, depression level at eleventh grade was also entered at the fourth step. Similarly, for the depression symptoms in twelfth grade, depression symptoms in eleventh grade was entered at the first step as baseline, followed by background variables as the second set, and time spent on the nine after-school activities during eleventh grade as the third set. Finally, educational achievement at eleventh grade was also entered at the fourth step. The rationale for adding the fourth step in regression is based on the established association between academic achievement and psychological adjustment among Taiwanese adolescents. For instance, Kao and Lu (2001) found that better-performing Taiwanese 9th graders reported much lower perceived stress than their less-well-performing counterparts. Lu and Lin (2003) further noted that academic achievement was the most significant predictor of Taiwanese 12th graders’ happiness. On the other hand, Yang (2005), who examined educational achievement and adolescents’ mental health with an earlier data set also collected by the TEPS, found higher educational achievement to be associated with worse mental health until achievement was high, where the downward trend stopped and curved upward only slightly. In this study, we extended the above research findings pertaining to psychological adjustment to explore the mutual influences of academic achievement and depression, in a prospective design.

RESULTS

For after-school academic engagement, when asked to indicate daily time spent on homework and preparing for tests, 26.6% of Taiwanese eleventh graders reported spending less than 1 hour, 32.3% reported between 1 and 2 hours, 23.3% between 2 and 3 hours, 12.8% between 3 and 4 hours, 3.9% between 4 and 6 hours, and 1.1% more than 6
hours. When asked to indicate how much time they spent attending after-school academic-enrichment programs every week, 27% reported they did not attend any academic-enrichment program, 25.6% reported spending less than 4 four hours, 33.0% between 4 and 8 hours, 7.1% between 8 and 12 hours, 3.8% between 12 and 16 hours, and 3.5% more than 16 hours. And when asked to indicate how much time they spent attending private cram schools every week, 51.9% reported they did not go to any private cram schools, 19% reported they spent less than 4 hours, 16.6% between 4 and 8 hours, 8.0% between 8 and 12 hours, 3.7% between 12 and 16 hours, and 0.9% more than 16 hours.

For school-based extracurricular activities, when asked to indicate time spent weekly, 21.0% of Taiwanese eleventh graders reported they did not participate in any extracurricular activities, 19.5% reported less than 1 hour, 32.6% between 1 and 2 hours, 15.1% between 2 and 4 hours, 4.7% between 4 and 6 hours, and 7.0% more than 6 hours. For after-school, non-organized activities, when Taiwanese eleventh graders were asked to indicate how much time they spent daily watching TV or videos, 7.6% reported never or almost never watching TV or videos, 20.9% reported less than 1 hour, 31.7% between 1 and 2 hours, 19.9% between 2 and 3 hours, 9.7% between 3 and 4 hours, and 10.1% more than 4 hours. When asked to indicate how many times they engaged in sports activities weekly, 7.8% reported less than one time, 16.7% about one time, 50.7% between 2 and 3 times, 12.4% between 4 and 5 times, 4.5% between 6 and 7 times, and 7.9% more than 8 times. When asked to indicate time spent on extracurricular reading in literature, history, biography, philosophy, politics, economics, technology, or information science weekly, 37.5% reported that they did not engage in extracurricular reading, 29.9% reported less than 1 hour, 19.6% between 1 and 2 hours, 8.2% between 2 to 4 hours, 2.7% between 4 to 6 hours, and 2.1% more than 6 hours. When they were asked to indicate time spent on Internet games weekly, 48.0% reported they did not play Internet games, 27.7% reported less than 5 hours, 11.1% between 6 to 10 hours, 5.0% between 11 to 15 hours, and 5.6% more than 16 hours. Finally, when Taiwanese eleventh graders were asked to indicate time spent on part-time employment weekly, 80.6% reported they did not work part-time, 7.9% reported less than 5 hours, 5.7% between 6 to 10 hours, 1.9% between 11 to 15 hours, 2.1% between 16 to 10 hours, and 1.8% more than 21 hours.

On average, Taiwanese adolescents spent about the same amount of hours daily on homework ($M = 1.92$, $SD = 1.28$) and on watching TV or videos ($M = 1.92$, $SD = 1.42$). On average, they also spent hours weekly on other after-school activities, ranging from spending the most to the least amount of time: after-school academic-enrichment pro-
grams ($M = 4.35$, $SD = 4.43$), Internet games ($M = 4.01$, $SD = 6.07$), private cram schools ($M = 2.85$, $SD = 4.10$), school-based extracurricular activities ($M = 1.76$, $SD = 1.90$), part-time employment ($M = 1.73$, $SD = 4.57$), and extracurricular reading ($M = 0.97$, $SD = 1.41$). Finally, they engaged in sports activities 3 times ($SD = 2.27$) weekly on average.

Table 1 presents the inter-correlations among the research variables. Taiwanese adolescents’ educational achievement in twelfth grade was positively correlated with time spent on homework, after-school, academic-enrichment programs, private cram schools, school-based extracurricular activities, sports, and extracurricular reading at eleventh grade, but negatively correlated with time spent on watching TV, Internet games, and part-time employment in eleventh grade. At the same time, Taiwanese adolescents’ depression symptoms in twelfth grade was positively correlated with time spent on homework, after-school academic-enrichment programs, private cram schools, school-based extracurricular activities, and extracurricular reading in eleventh grade, whereas they were negatively correlated with time spent watching TV, engaging in sports, and playing Internet games. Part-time employment was not significantly correlated with later depression symptoms.

Some of these associations were confirmed further by two sets of hierarchical regression analyses, with all variables taken into consideration at the same time. Table 2 presents how educational achievement in the previous year, background variables, after-school time use in the previous year, and depression level in the previous year helped explain Taiwanese adolescents’ educational achievement in twelfth grade, accounting for 64.2% of the total variance. As one would expect, educational achievement in eleventh grade had the highest relative effect on subsequent educational achievement of all the variables in the model, and two of the background variables significantly entered the equation: father’s educational level and family income. Beyond them, six of nine after-school time use variables also significantly entered the equation: time spent on homework, academic-enrichment programs, private cram schools, TV, extracurricular reading, and part-time employment in the previous year. Although their combined contribution to the equation was relatively small, given the stringent statistical controls we employed and the prospective longitudinal design of the study (involving a one-year gap between independent variables and dependent variables), it is striking that regression coefficients for some of the time-use variables reached the level of significance at $p < .05$ or $p < .001$. While all three academic-oriented activities and
Table 1: Inter-Correlation between Research Variables

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


901
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*p<.05  **p<.01  ***p<.001
extracurricular reading were positively related to educational achievement, watching TV and working part-time were negatively associated. Finally, depression level in eleventh grade was not found to be a significant predictor of educational achievement in twelfth grade.

Table 2 also shows how depression symptoms in the previous year, background variables, after-school time use in the previous year, and educational achievement in the previous year helped explain Taiwanese adolescents' depression symptoms in twelfth grade, accounting for the 31.9% of the total variance. As anticipated, depression level in eleventh grade had the highest relative effect on subsequent depression level of all the variables in the model, and one of the background variables significantly entered the equation: gender. Beyond them, two out of nine after-school time use variables also significantly entered the equation: time spent in private cram schools and Internet games in the previous year. Similarly, although their combined contribution to the equation was relatively small, given the stringent statistical controls we employed and the prospective longitudinal design of the study, it deserves attention that regression coefficients for these two time-use variables reached the level of significance at $p < .01$. Whereas time spent on private cram schools was positively related to depression symptoms, playing Internet games was negatively associated. Finally, educational achievement in eleventh grade was not found to be a significant predictor of depression symptoms in twelfth grade.

**DISCUSSION**

Using a nationally representative sample in Taiwan, this study found that for after-school academic-related activities, on average, eleventh graders in Taiwan spent about 2 hours per day on homework, more than 4 hours per week on academic-enrichment programs provided by their schools, and less than 3 hours per week on private cram school programs. However, it is important to note that there were great individual differences in students' involvement in the latter two activities; for example, more than one fourth of the sample reported not attending any academic-enrichment programs and more than one half reported not going to any private cram schools. For other after-school activities, on average, eleventh graders in Taiwan spent about 2 hours per day watching TV or videos, and 4 hours per week playing Internet games, less than 2 hours engaging in school-based extracurricular activities, less than 2 hours working in part-time employment, around 1 hour reading extracurricular texts in literature, history, biography, philosophy, politics, economics, technology, or information sci-
ence, and engaged in sports activities 3 times a week. Again, there were great individual differences in the extent of students’ involvement in some of these activities; for example, about one half of the sample indicated not playing Internet games, and as many as 80% reported not working part-time. Results of this present study were generally consistent with what Fuligni and Stevenson (1995) reported in their comparative study concerning Taiwanese eleventh graders’ after-school time use.

Beyond the general picture of how Taiwanese adolescents allocate their after-school time, this study probed into the relationships between time spent on various activities and educational achievement, defined by a composite score of four curriculum-free ability subtests: analytical ability, mathematical ability, language ability, and science ability. A hierarchical regression analysis found that, in addition to the student’s educational achievement in the previous year and the father’s educational level and family income, though small in magnitude, time spent on six out of nine after-school activities during eleventh grade also help predict educational achievement in twelfth grade.

In other words, even when earlier educational achievement level and background variables were taken into account, time spent on all three after-school, academic-related activities (e.g., homework, academic-enrichment programs, and cram schools), and on extracurricular reading in eleventh grade, still had a positive impact on educational achievement in twelfth grade. These results confirmed findings from Western after-school time-use studies (e.g., Camp, 1990; Cooper et al., 1999; Schreiber & Chambers, 2002), and Cooper et al.’s (2006) general conclusions generated from a comprehensive review, all suggesting a positive linkage between time spent on homework and educational achievement. In addition, this study’s results were consistent with Fuligni and Stevenson’s (1995) findings concerning the positive relationships of time spent on studying and on taking classes in cram schools to Taiwanese adolescents mathematics scores, though not consistent with their findings concerning a negative relationship between pleasure reading and mathematics achievement.

In contrast, time spent on TV and part-time employment in eleventh grade had negative effects on students’ educational achievement in twelfth grade. These results not only supported some Western studies that found negative relationships between watching TV and part-time employment and educational achievement (e.g., Cooper, et al., 1999; Jordan & Nettles, 2000; Keith et al., 1986; Schreiber & Chambers, 2002; Steinberg & Cauffman, 1995; Weller et al., 2003), but also were consistent with Fuligni and Stevenson’s (1995) findings concerning the
negative relationships between time spent on TV and part-time working and Taiwanese adolescents' mathematic achievement. In terms of time spent on Internet games, we found it not to be a significant predictor for later educational achievement when background and other after-school activity variables were taken into consideration, even though these two factors were found to be negatively linked in the zero-order correlation analysis. In an earlier study, Hunley et al. (2005) found the correlation between American 10th graders' time spent on Internet games and academic achievement was not significant. As a relatively less-explored area, future research is recommended to investigate the relationship between Internet use and educational achievement in depth.

This study also probed the relationships between time spent on various activities and psychological well-being, with depression symptoms serving as the indicator. Using a hierarchical regression analysis, it was found that, in addition to the student's depression level in the previous year, and gender, though small in magnitude, time spent on two out of nine after-school activities during eleventh grade also help predict depression symptoms in twelfth grade. In other words, even when earlier depression level and background variables were taken into account, time spent in private cram schools in eleventh grade was still found to be a significant predictor for depression symptoms. "Cram schools" was defined by Pettersen (1993) as those "after-school schools" in which an elite corps of teachers delivers fast-paced instruction to prepare students for admittance to the "right" colleges. According to Kwok (2004), even though there have been large-scale educational reforms initiated at secondary levels in East Asia since the last decade, the increasing growth of East Asia mass tutorial schools cannot easily be hindered. Many Taiwanese educators have been concerned that adolescents' psychological states during this stage are not optimal for development. In the present study, we found that even though the variable of time spent on private cram schools produced an effect size about twice as great as those of homework and school-based academic-enrichment programs on later educational achievement, it was at the same time found to be the only one among the three academic-related after-school time-use variables that had a negative effect on later psychological well-being. These findings provided empirical evidence to support conventional wisdom that even though time spent on after-school academic-oriented activities is beneficial for adolescents' educational achievement, time spent on activities other than homework and school-based academic-enrichment programs (e.g., spending time on courses offered by cram schools), may be detrimental to adolescents'
psychological development. Conversely, time spent on Internet games was found to be associated with lower depression symptoms.

Last but not least, Western researchers who hold the view that participating in structured activities provides an experience that contributes to adolescents' overall development have accumulated plenty of empirical evidence linking extracurricular activities involvement with better educational achievement and better psychological adjustment (e.g., Camp, 1990; Cooper et al., 1999; Jordan & Nettles, 2000; Schrieber & Chambers, 2002; and most of the studies reviewed by Feldman and Matjasko, 2005). Nevertheless, the present study did not find time spent on school-based extracurricular activities to be a predictor for Taiwanese adolescents' later educational achievement or psychological well-being. These results were consistent with Fuligni and Stevenson's (1995) findings that extracurricular activities participation was not correlated with mathematics achievement of both Taiwanese and Japanese eleventh graders, even though it was strongly correlated with American adolescents' mathematics achievement. Might a cultural factor account for these differences? More researchers on the associations between part-time employment and depression (Largie et al., 2001; Shanahan et al., 1991; Steinberg & Dornbusch, 1991) and between extracurricular reading and depression (Csikszentmihalyi & Hunter, 2003; MaHale et al., 2001), this study did not find working part-time and extracurricular reading to be predictors of Taiwanese adolescents' later depression symptoms.

CONCLUSION

This study found that time spent on after-school, academic-related activities, including homework, school-provided after-class academic-enrichment programs, and classes offered by private cram schools, had positive effects on Taiwanese adolescents' educational achievement; at the same time, spending time in private cram schools had negative effects on these adolescents' psychological well-being. Time spent in school-based extracurricular activities had no effect on their educational achievement or well-being. Time spent on part-time employment had a negative effect on educational achievement, but no effect on depression symptoms. Regarding non-organized, nonacademic-related activities, time spent on extracurricular reading had a positive effect, and time spent on watching TV had a negative effect on educational achievement, while time spent playing Internet games had a positive effect on psychological well-being. Some of these findings are consistent
with those from the Western research literature, and some have extended or challenged established accounts.

Further research is recommended in the following areas. First, this study provided some evidence that after-school, academic-related activities, especially attending private cram schools, may benefit Taiwanese adolescents' educational achievement at the cost of psychological well-being. Research from other cultures is suggested to explore this issue in depth. Second, there is consensus among Western studies based on the developmental model that structured activities play an important role not only in adolescents' psychological adjustment, but in their academic achievement. However, this study revealed that time spent on extracurricular activities was not a predictor of depression symptoms or educational achievement for Taiwanese adolescents when background factors and other after-school time-use variables were taken into consideration. Further research is needed to more fully investigate the contextual factors related to this issue. And finally, this study examined the relationships of time spent playing Internet games to educational achievement and psychological well-being within the context of after-school time use. Though small in magnitude, this study found that spending time playing Internet games appeared to relieve Taiwanese adolescents of depression symptoms. More research is encouraged to clarify this relationship.

REFERENCES


