

# The Effects of Fathers' Working Hours on Youth Behavior: Evidence from a Change in the Standard Workweek\*

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*This study estimates the effects of fathers' hours worked on their children's behavior. To identify the source of the exogenous change, it uses the legislated reduction in the workweek that was implemented in Korea. Since the new system was applied to large establishments first, one could analyze the effects using a difference-in-differences estimation method. This study finds that the system change increases boys' hours of self-study and decreases their alcohol use (reduced-form estimates). The channel is fathers' increased knowledge of their children's whereabouts and the children's decreased conflict with their parents. However, no effects are found on girls' behavior.*

JEL Classification: I12, J13, J22, J81

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## I. Introduction

The literature has long shown that parental influence is a significant predictor of children's problem behavior. One type of literature especially emphasizes the parental monitoring of children. These studies found that children whose parents know about their children's whereabouts and activities are less likely to drink alcohol or smoke (e.g., Barnes and Farrell, 1992; Wood et al., 2004; Bahr et al., 2005; Ryan et al., 2010). Social bond theory proposed by Hirschi (1969) says that children

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who have a higher level of attachment to their parents exert a greater level of social control, avoiding anti-social behaviors; such an attachment to their parents can be generated through parental monitoring, supervision, and punishment of such behaviors. In addition, Gottfredson and Hirschi (1990) proposed the general theory of crime, which states that crime or delinquent behaviors are caused by low self-control: The most important factor for the development of self-control is parental rearing behavior, which includes parental supervision and monitoring.

With regard to parents who spend more time with their children and work fewer hours (Sandberg and Hofferth, 2001; Hallberg and Klevmarken, 2003; Rapoport and Le Bourdais, 2008; Fox et al., 2011), from a policymaker's perspective, reducing parental hours worked could be an effective way to prevent children's problem behavior, as this may allow an increase in parents' knowledge of their children's whereabouts and activities. However, few studies have analyzed this relationship; two exceptions are Aughinbaugh and Gittleman (2004) and Christie-Mizell et al. (2011). Aughinbaugh and Gittleman (2004) used the National Longitudinal Survey of Youth (NLSY) data to analyze the effect of the number of hours that a mother worked on children's risky activities. They found that maternal employment had no effect on children's smoking, but that increased the probability of their drinking alcohol. Christie-Mizell et al. (2011) used both NLSY data and the NLSY Child Sample to analyze the effects of parental hours worked on the bullying behaviors of 10-to-14-year-olds. They found that when a father worked full time or overtime and his children thought they did not spend enough time with their father, the children's bullying behaviors increased.

It is noteworthy that parental hours worked are not randomly determined, but could be intentionally chosen. For example, those who are more concerned about their children's well-being are likely to work less and spend more time with their children, whereas those who are less concerned are likely to work more and spend less time with them. Despite this, the two studies described above did not properly address the endogeneity of parental hours worked. Christie-Mizell et al. (2011) simply compared the children of parents who worked different numbers of hours (OLS estimation) and thus, their estimates were likely to be biased. Aughinbaugh and Gittleman (2004) used a mother fixed-effects estimation method to compare the risky behaviors of siblings; however, this method would produce biased results if a mother changed her hours worked to accommodate the need of a certain child.

This study uses an exogenous source concerning the change in the hours worked to estimate the effects on youth behavior, namely, children's self-study and alcohol usage.<sup>1</sup> The exogenous source comes from the legislated change in the standard

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<sup>1</sup> Self-study is used because Korean students spend a substantial amount of time on studying. Kang and Lee (2015) reported that they spend almost twice more time on academic activities than their US counterparts.

workweek that has taken place in Korea since July 2004. In July 2004, the Korean government began reducing the standard workweek by four hours, from 44 to 40. Since this change was implemented in large establishments first and smaller ones were added afterward, in July 2005, July 2006, *etc.*, this system change allows us to analyze the effects of parental hours worked via a difference-in-differences estimation method.<sup>2</sup> For the analysis, this study uses the individual panel data of a cohort that started in March 2004, which is three months prior to the introduction of the new system. The members of the cohort were in the ninth grade in 2004 and were followed until 2007 when they were high school seniors. The subsequent data were obtained in June 2005, July 2006, and July 2007; thus, this study analyzes four years of data. The data include information about the size of the parents' workplaces, so that one can infer whether they had a 40-hour workweek or a 44-hour workweek in a certain year. The data also provide information on the students' self-study hours and consumption of alcohol, which then enables the investigation of the effect of the hours worked by their parents.

As Kawaguchi et al. (2013) reported, the new legislation decreased the number of hours worked mostly on Saturdays. This means that the change is more likely to impact the weekend activities of the youth. Thus, this study examines the effects on their children's alcohol usage and time spent in self-study, as these activities mostly occur at the weekends. Previous studies (e.g., Wagenaar et al., 1993; Kim et al., 2005; Bingham et al., 2009; Livingston et al., 2010) have found that young people drink alcohol mainly at weekends. In addition, it may be hard for students to find time for self-study on weekdays, because they spend a substantial amount of time at school and thus, are more likely to engage in self-study at the weekends. Moreover, other youth problem behaviors, such as teen pregnancy and drug use, are not that significant in Korea, and the smoking rate is relatively low: Only 8.3% of boys and 2.7% of girls in the sample of this study responded that they currently smoked.

To examine whether the reduction in the standard workweek had a significant effect on the children's behavior, this study analyzes whether the children changed their behavior after their fathers adopted a 40-hour workweek. In other words, it compares the behavior change of the children whose fathers adopted the new 40-hour workweek with that of those whose fathers continued to work a 44-hour workweek (reduced-form estimation). This study restricted the analysis to the effect of the fathers' hours worked, because a large number of Korean mothers do not work, whereas few working mothers work in large establishments.<sup>3</sup> Indeed, Hamermesh et al. (2017) found that the new system in Korea mainly affected the

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<sup>2</sup> This study uses the term "parents" to include both parents and guardians.

<sup>3</sup> Out of the 2,000 students included in the baseline survey, 1,896 students gave information on their mothers' employment status, and 1,176 of them had mothers who worked. Among the 1,176 working mothers, information was provided on the size of the workplace for 618 mothers, and 117 of them worked in establishments with 100 or more employees.

male workers' hours worked, whereas the hours worked by the female workers were not significantly affected.

Reduced-form estimates are meaningful, because reducing the standard workweek is the only policy measure by which to reduce the actual hours worked. It is not possible for policymakers to force employers to reduce the actual hours of each employee. Thus, policymakers may be more interested in the reduced-form estimates than the effects of the actual hours worked.

The difference-in-differences estimates could have an upward bias if a father moves to a company that features a reduced workweek to focus more on taking care of his children. To address this possibility, this study does not use the current size of the father's company, but rather the size of the company obtained in a 2004 survey conducted three months prior to the introduction of the new system.

This study found that reducing the fathers' standard workweek by four hours increased the number of boys' weekly self-study by two hours. In addition, it decreased the boys' probability of alcohol use by 4.5 percentage points. Given that 33.2% of the 12<sup>th</sup> grade boys drank alcohol, this estimate is equivalent to 13.5%, which implies that during the 2004-2007 period, 13.5% of the boys, who had drunk alcohol at least once a month before the policy was implemented, drank alcohol only once or twice a year or stopped drinking alcohol after the policy began. Increased monitoring by the fathers and the decreased conflict with their parents drove these results. The new system increased the fathers' probability of knowing about the boys' whereabouts after school and at night by 11.0 percentage points and decreased the boys' probability of experiencing conflict with their parents by 4.0 percentage points. These estimates are equivalent to 30.1% and 10.0%, respectively, since 35.5% of the 12<sup>th</sup> grade boys' fathers knew about their whereabouts, and 39.9% of them experienced conflict with their parents. However, no effects were found on the number of girls' self-study hours or alcohol usage. The monitoring of the girls by the fathers and experiencing conflict with their parents were not affected either.

One might think that the effect on the monitoring of the boys by their fathers is too large, given that the reduction in the standard hours on Saturday is just four hours. However, the reduction in the *actual* hours worked on Saturdays is more than four hours, and the commute time should also be considered. As described in Section II, the OECD (2015) showed that Korean full-time *male* employees worked an average of 53.2 hours a week in 2004, the first year of the new system. This implies that they worked almost 10 hours longer per week than the regular 44 hours, or 1.5 hours longer per day. On Saturdays, according to the Time Use Survey of Statistics Korea (2014), full-time male employees worked an average of 5 hours and 42 minutes in 2004. It also showed that their average Saturday commute time in 2004 was one and a half hours. This means that if they left home for work at 8 o'clock in the morning on Saturday, they returned home at around 3 or 4 o'clock in the afternoon. Returning home at this hour must have limited their ability to know

about their children's whereabouts and activities.<sup>4</sup> However, having a day off on Saturdays and staying at home all day is much more likely to increase their ability to monitor their children. Indeed, previous studies (e.g., Kim, 2011; Park, 2014; Lee, 2015) found that the new system improved the work and life balance for 40-hour employees, allowing them to spend more time in taking care of their family members.

The remainder of this paper is organized as follows. The next section describes the standard workweek reduction in Korea, and Section III describes the data used in this paper; Section IV describes the empirical strategy of this paper, while Section V presents the estimation results; Section VI concludes this paper.

## II. Background on the Standard Workweek Reduction

Koreans work long hours. In 2014, full-time employees worked 47.7 hours a week on average, which is the third longest among the OECD countries (OECD, 2015).<sup>5</sup> Since long hours worked are often linked to health problems that include anxiety, injuries, and heart disease (e.g., Harrington, 2001; Dembe, 2005) and is a significant contributor to any imbalance between work and life, the shortening of the work hours has long been requested in Korea.

One policy that the government has implemented to make people work fewer hours involves reducing the standard hours. The theory on which the policy is based is that reducing the legal working hours could increase overtime pay and thus, employers have incentives to make their employees work less. Ever since the Korean Labor Standard Acts were established in 1953, a reduction in the standard workweek has occurred twice in Korea. The first reduction took place in 1989, when the standard hours were reduced from 48 to 44 hours. The first reduction applied to all full-time employees, regardless of the size of the company in which they worked. The second reduction took place in 2004, when the standard changed to 40 hours.<sup>6</sup>

When the second reduction took place in 2004, the Korean government took several measures to ease possible increases in the labor cost for employers. The

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<sup>4</sup> Prior to 2012, Korean students went to school on Saturdays: Until 2004, they went to school every Saturday; in 2005, schools were closed for one Saturday per month (the fourth Saturday); starting in 2006, schools were closed on the second and fourth Saturdays; and starting in 2012, schools were closed every Saturday. Finn (2010) describes that Saturday school attendance is common in Asian countries.

<sup>5</sup> Turkey and Mexico ranked first and second, respectively.

<sup>6</sup> Korea is not the only country to change the standard workweek to reduce the hours worked. The United States adopted the 40-hour workweek in 1938, and Japan changed its law in 1987, 1990, and 1993 to gradually reduce the standard hours from 48 hours to 40 hours. France adopted the 35-hour workweek in 1998 after the country had experienced a 40-hour workweek since 1946. Lee et al. (2007) and Fleck (2009) describe the standard workweek in Korea and other countries.

government revised the acts to allow employers to pay 125% of the ordinary wage for the first four hours of overtime worked for three years after adopting the 40-hour workweek, while the usual overtime pay rate is 150% of the ordinary wage. The government also reduced the annual leave time, so that employees have a maximum of 25 days with a 40-hour workweek, while under a 44-hour workweek no such limit exists.

[Table 1] Timeline for the Introduction of the 40-hour Workweek

Time	Establishment size
July 2004	Employees in establishments with 1,000 or more employees or employees in banking and insurance companies
July 2005	Employees in establishments with 300-999 employees
July 2006	Employees in establishments with 100-299 employees
July 2007	Employees in establishments with 50-99 employees
July 2008	Employees in establishments with 20-49 employees
July 2011	Employees in establishments with 5-19 employees

In addition, the government determined a gradual schedule for the implementation of the 40-hour workweek, so that the new system was not applied to companies of every size when it was introduced in 2004, but rather to large establishments first.<sup>7</sup> As described in Table 1, in July 2004, the system covered only those who were employed in establishments with 1,000 or more employees, as well as banking and insurance company employees: Banking and insurance companies were included from the beginning, regardless of their size. In July 2005, one year after the new system was introduced, establishments with 300-999 employees were included, and in July 2006, the limit was expanded to include companies that had 100 employees. In July 2011, the new system covered those who were employed in establishments with 5-19 employees.

The reduction in the standard workweek applies to both white and blue-collar workers. Under the 44-hour workweek, white-collar workers work six days—eight hours on weekdays and four hours on Saturday. Under the 40-hour workweek, they work five days—eight hours on weekdays and none on Saturday.

The reduction in the standard workweek is considered to have played a significant role in decreasing the number of hours that Korean full-time employees work. As described above, the average weekly number of hours worked were 47.7 for full-time employees in 2014. In 2004, the year when the new system was introduced, the number was 52.2, and in 2000, it was 53.6. The numbers for full-time *male* employees were 54.5 in 2000, 53.2 in 2004, and 48.8 in 2014 (OECD, 2015). Studies

<sup>7</sup> Larger firms are considered to be less vulnerable to such change than smaller ones. One reason is that larger firms can increase the number of jobs faster than smaller ones (Pyo et al., 2016).

have also documented that the decrease in the standard workweek in Korea is associated with a reduction in the actual hours worked. Shin et al. (2002) analyzed the first standard workweek reduction implemented in 1989 and found that a 1% decrease in the standard workweek reduced the actual hours worked by 0.7%. Nam (2002) also examined the first standard workweek reduction and found that a four-hour decrease in the standard workweek was associated with a 1.4-2.3 hours decrease in actual hours worked. Kim (2008) analyzed the second standard workweek reduction and found that reducing the standard workweek by 1% decreased the actual hours worked by 0.8%. Studies that examined data from other countries also found positive effects of the reduction in the standard workweek on the actual hours worked. Hart and Sharot (1978) used UK data and found that a 1% reduction in standard hours decreased the actual hours worked by 0.89%, while Hunt (1999) used German data and found that a one-hour reduction in standard hours for hourly workers in manufacturing led to a reduction in the actual hours worked by 0.85-1.0.

### III. Data

This study analyzes the Korean Education & Employment Panel that the Korean Research Institute for Vocational Education and Training (KRIVET) obtained.<sup>8</sup> In 2004, which is the first year of the study, KRIVET surveyed 2,000 ninth graders (996 boys and 1,004 girls) enrolled in 100 schools, as well as 4,000 12<sup>th</sup> graders enrolled in 200 schools.

This study uses the data of a ninth-grade cohort obtained from 2004 to 2007. The data contain information on the students' self-study and alcohol consumption. The students were asked to write how many hours per week they spent in self-study. For alcohol usage, they were asked how often they drank alcohol, and the question had six possible responses: almost every day, three or four times a week, one or two times a week, one or two times a month, one or two times a year, and never. Since the 2004 survey took place in March 2004, the survey asked whether the students drank alcohol around that time. The three subsequent surveys took place in June 2005, July 2006, and July 2007, and thus, these surveys asked whether the students drank alcohol during these three points in times. The student data also include the gender, the number of siblings, birth order at home, the monthly allowance, and whether their guardians were their parents.

In addition, the data include information on the monitoring of the children by their fathers. This includes whether the students thought their fathers knew about their whereabouts after school and at night and whether the students thought their

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<sup>8</sup> The data are publicly available at <http://www.krivet.re.kr/eng/eu/eg/euCAADs.jsp>.

fathers knew about what their daily activities were. In addition, the data contain information on whether the children experienced conflict with their parents and the amount of time spent talking with their fathers per day. The information on the fathers' knowledge of their children's whereabouts and daily activities was obtained from the students in 2005 and 2007, but not in 2004 and 2006. Monitoring by fathers was assessed on a five-point Likert scale, and the father is considered to have had knowledge if the student chose a four or five.

The family data include the parents' education level, employment status, whether the parents work, and the size of workplace where the parents work.<sup>9</sup> The size of the parents' workplace consists of five categories: 1-10, 11-49, 50-299, 300-999, and 1,000 or more employees. The category of 50-299 employees is considered to be the category of 100-299 employees. In addition, the parents' employment status consists of five categories: permanent-wage employees, temporary-wage employees, self-employed with employees, self-employed without employees, and unpaid family workers. This study considers self-employed with no employees to be employees in establishments with a size of 1-10 employees. The information on the size of the parents' workplace was obtained from the parents, not the students.

Not all of the students surveyed were included in the analysis. Out of the 996 boys who were included in the baseline survey in 2004, 898 gave information on the size of their fathers' workplace. For the girls, 868 out of 1004 students gave such information. Some students had no information, because their fathers were unemployed or refused to provide the information; thus, these students were dropped from the analysis. In addition, some were not followed up with in the subsequent surveys. In 2005, 787 boys responded to the survey, while 793 and 769 boys responded in 2006 and 2007, respectively. For girls, the corresponding numbers are 782, 760, and 741, respectively. Among these students, some did not have the information required for the regression; thus, 3,226 boy/years and 3,129 girl/years are included in the analysis. If all of the 898 boys and 868 girls had been followed up with for the subsequent three years, 3,592 and 3,472 observations would have been included in the analysis, respectively.

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<sup>9</sup> Unfortunately, the data do not include information on the actual hours worked; thus, it is not possible to examine the relationship between the standard workweek and actual hours worked.



**[Table 2]** Descriptive Statistics

	Boys		Girls	
	Mean	Standard deviation	Mean	Standard deviation
Weekly hours of self-study				
year 2004 (9 <sup>th</sup> grade)	4.5	5.0	4.9	5.5
year 2005 (10 <sup>th</sup> grade)	6.5	7.7	7.0	8.2
year 2006 (11 <sup>th</sup> grade)	8.5	9.7	8.1	9.4
year 2007 (12 <sup>th</sup> grade)	11.6	14.1	11.7	13.8
Drink alcohol (%)				
year 2004 (9 <sup>th</sup> grade)	4.2	20.2	8.8	28.3
year 2005 (10 <sup>th</sup> grade)	20.7	40.5	19.8	39.9
year 2006 (11 <sup>th</sup> grade)	29.0	45.4	19.9	39.9
year 2007 (12 <sup>th</sup> grade)	33.2	47.1	20.4	40.3
Number of siblings	2.1	0.6	2.3	0.7
Birth order	1.6	0.7	1.5	0.7
Guardians are the parents (%)	94.5	22.8	95.4	21.0
Father—post-high school (%)	33.8	47.3	29.9	45.8
Monthly allowance (thousand Korean won)	52.4	52.9	49.9	47.3
Fathers' firm size/type				
1000- or banking companies (%)	4.4	20.5	6.1	23.9
300-999 (%)	3.9	19.4	4.9	21.6
100-299 (%)	14.8	35.5	12.4	33.0
1-99 (%)	76.9	42.2	76.5	42.3
Fathers' employment status				
Permanent-wage employees (%)	45.2	49.8	43.0	49.5
Temporary-wage employees (%)	8.0	27.1	9.5	29.4
Self-employed with employees (%)	18.0	38.4	16.6	37.2
Self-employed without employees (%)	28.8	45.3	30.9	46.2
Number of observations	3,226		3,129	

Note: Standard deviations are in parenthesis. A student is considered to drink alcohol if he chooses one of the five categories: almost every day, three or four times a week, one or two times a week, or one or two times a month. The information on the fathers' firm size and employment status is from the 2004 survey data.

Table 2 shows the descriptive statistics for 3,226 boy/years and 3,129 girl/years. According to the table, the 12<sup>th</sup> grade boys had a weekly average of 11.6 hours of self-study. For girls, the number is 11.7. In addition, 33.2% of the 12<sup>th</sup> grade boys and 20.4% of the 12<sup>th</sup> grade girls said that they currently drank alcohol. A student is considered to drink alcohol if he or she drinks at least one time a month. Thus, a student is considered to drink alcohol if he or she chooses one of the following five categories: almost every day, three or four times a week, one or two times a week, or one or two times a month.

[Table 3] Relationship with Father

	Boys		Girls	
	Mean	Standard deviation	Mean	Standard deviation
<b>Panel A: Monitoring</b>				
Whether father knows about my whereabouts after school and at night (%)				
year 2005 (10 <sup>th</sup> grade)	39.0	48.8	43.0	49.5
year 2007 (12 <sup>th</sup> grade)	35.5	47.9	45.3	49.8
Whether father knows about my daily activities (%)				
year 2005 (10 <sup>th</sup> grade)	42.3	49.4	38.2	48.6
year 2007 (12 <sup>th</sup> grade)	36.0	48.0	36.8	48.3
Number of observations	1,458		1,401	
<b>Panel B: Conflict and conversation</b>				
Whether I experience conflict with my parents (%)				
year 2004 (9 <sup>th</sup> grade)	42.7	49.5	41.2	49.3
year 2005 (10 <sup>th</sup> grade)	34.5	47.6	38.0	48.6
year 2006 (11 <sup>th</sup> grade)	40.6	49.1	41.0	49.2
year 2007 (12 <sup>th</sup> grade)	39.9	49.0	34.1	47.4
The number of daily minutes spent talking with my father				
year 2004 (9 <sup>th</sup> grade)	43.7	38.0	42.9	36.7
year 2005 (10 <sup>th</sup> grade)	24.9	27.8	26.0	26.1
year 2006 (11 <sup>th</sup> grade)	23.7	30.0	28.9	30.0
year 2007 (12 <sup>th</sup> grade)	24.4	30.5	25.8	31.6
Number of observations	3,226		3,129	

Note: Panel A is based on the data obtained in 2005 and 2007, because questions about the parental monitoring of their children were included only in these two years.

Table 3 shows the fathers' knowledge of their children's whereabouts and daily activities. It also shows whether the children experienced conflict with their parents and the number of minutes they spent talking with their fathers daily. Approximately 40% of the children responded that their fathers knew about their whereabouts and daily activities, and approximately 40% of them experienced conflict with their parents. In addition, they talked for approximately 40 minutes per day with their fathers when they were in the ninth grade, and the time was reduced to approximately 25 minutes after they entered high school.

## IV. Empirical Strategy

Consider the following regression equation regarding the behavior of a youth  $i$  in region  $r$  in year  $t$ :

$$T_{irt} = \delta_0 + \delta R_{irt-1} + \mathbf{F}_{irt} \mathbf{\Gamma} + \alpha_i + \eta_{rt} + \varepsilon_{irt}, \quad t = 2004, 2005, 2006, 2007 \quad (1)$$

where  $T$  is a variable of  $i$ 's behavior. For self-study, it is the number of weekly self-study hours. For alcohol consumption, it is a dummy variable that equals 1 if  $i$  is involved in alcohol use in year  $t$ , 0 otherwise.  $R$  is a dummy variable that equals 1 if the father has a 40-hour workweek in year  $t-1$ , 0 otherwise.  $F$  is a vector of children and family characteristics. This includes whether the guardians are parents and year dummy variables interacted with each of the following: the number of siblings, birth order, the fathers' education level, and whether their guardians are the parents. When the dependent variable is alcohol usage, the monthly allowance for children is added to the vector  $F$ . The vector does not include the household income, but only the monthly allowance, because the latter has a higher explanatory power than the former, and about 350 boys and 290 girls had no information on their household income.  $\alpha$  is the individual fixed effects,  $\eta$  is the year-by-region fixed effects, and  $\varepsilon$  is an idiosyncratic term. Year-by-region fixed effects are controlled for, because region-specific conditions can affect larger firms differently, thus confounding the effects of the reduction in the standard workweek.<sup>10,11</sup>

The parameter of interest is  $\delta_1$ . Estimating  $\delta_1$  via a difference-in-differences estimation method could produce biased results, since a father could move to a company featuring a reduced workweek to focus more on taking care of his children. For example, being aware of the implementation plan of a 40-hour workweek, a father might move to a company of, say, 400 employees from a company of 200 employees in June 2005, which is one month before the shorter week was introduced in workplaces featuring 300-999 employees. In this case,  $\delta_1$  could be overestimated. To address this issue, this study uses the size of the company in which the father was employed in 2004, when the new system was introduced. Thus, this study estimates the following equation:

$$T_{it} = \beta_0 + \beta_1 H_{it-1} + F_{it} B + \alpha_i + \eta_{it} + v_{it}, \quad t = 2004, 2005, 2006, 2007 \quad (2)$$

where  $H$  is equal to 1 if a student's father is employed in a company in 2004 that is supposed to adopt a 40-hour workweek in year  $t-1$ , 0 otherwise. Hence, if  $t$  is 2005, the variable is 1 if the father worked in a company with 1,000 or more employees or in a banking company in 2004, 0 otherwise; if  $t$  is 2006, the variable is 1 if the father worked in a company with 300 or more employees in 2004, 0 otherwise; if  $t$  is 2007, the variable is 1 if the father worked in a company with 100 or more employees in 2004; if  $t$  is 2004, the variable is 0 for everyone. Thus,

<sup>10</sup> The region consists of the seven largest cities and eight provinces in Korea. See the following website for detailed information about the location of each city and province in Korea. [https://en.wikipedia.org/wiki/Administrative\\_divisions\\_of\\_South\\_Korea](https://en.wikipedia.org/wiki/Administrative_divisions_of_South_Korea)

<sup>11</sup> Adding year-by-occupation fixed effects left the results unchanged. The results are available upon request.

students whose father worked in a company with 1,000 or more employees or in a banking company in 2004 has values of 0, 1, 1, and 1 for  $H$  in 2004, 2005, 2006, and 2007, respectively. Students whose father worked in a company with 300-999 employees in 2004 have values of 0, 0, 1, and 1 for  $H$ , respectively.

To obtain the confidence intervals, this study uses a wild bootstrap procedure suggested in Cameron et al. (2008). The procedure can be used when the outcomes of individuals within the same cluster are considered to be correlated, but the number of clusters is not very large. The cluster in this study is the firm size level in each year, and its number is 16 ( $=4 \times 4$ ). According to Bertrand et al. (2004), when the number of clusters is not very large, clustered standard errors could produce small standard errors, leading to the production of large t-statistics.

Finally, this study estimates equation (3) to check whether the students' attrition from the follow-up surveys depended on their behavior in 2004. Students who drank alcohol or who spent more time in self-study in 2004 are more likely to continue to do so in subsequent years. If the children of 40-hour employees who drank alcohol in 2004 and thus, who were more likely to drink alcohol in the subsequent years did not respond to the follow-up surveys, their attrition might cause the coefficient on  $H$  in equation (2) to be overestimated. Equation (3) is as follows:

$$Attrit_i = \alpha_0 + \alpha_1 40hour_i + \alpha_2 T_{i2004} + \alpha_3 T_{i2004} \times 40hour_i + u_i \quad (3)$$

where  $Attrit_i$  is a dummy variable that is equal to 1 if a student did not participate in any of the follow-up surveys after 2004 and 0 otherwise.  $40hour$  is a dummy variable that is equal to 1 if a student's father adopted a 40-hour workweek in 2004, 2005, or 2006 and 0 otherwise.  $T_{i2004}$  is a variable of youth behavior in 2004. For self-study, it is the number of weekly self-study hours in 2004; for alcohol consumption, it is a dummy variable that is equal to 1 if a student was involved in alcohol use in 2004 and 0 otherwise.  $u_i$  is an idiosyncratic term.

The effect of weekly hours of self-study (or drinking alcohol) in 2004 on non-response in subsequent years is  $\alpha_2$  for the children of 44-hour employees and  $(\alpha_2 + \alpha_3)$  for the children of 40-hour employees. A positive value of  $\alpha_3$  when  $T_{i2004}$  refers to self-study means that the children of 40-hour employees who spent a long time in self-study in 2004 were more likely to have a value of  $Attrit$  equal to 1 than the children of 44-hour employees who spent the same length of time in self-study in 2004, causing the estimate in equation (2) to be biased downwardly. On the other hand, a negative value of  $\alpha_3$  could cause the estimate in equation (2) to be biased upwardly. A positive  $\alpha_3$  when  $T_{i2004}$  refers to alcohol usage means that the children of 40-hour employees who drank alcohol in 2004 were more likely to have a value of  $Attrit$  equal to 1 than the children of 44-hour employees who drank alcohol in 2004, causing the estimate in equation (2) to be biased upwardly.

On the other hand, a negative  $\alpha_3$  may lead to the estimate in equation (2) being biased downwardly.

V. Results

5.1. Effect on Hours of Self-study and Alcohol Usage

[Table 4] Effects of Work Hour Reductions on Youth Behavior

	Boys		Girls	
	(1)	(2)	(3)	(4)
<b>Panel A: Dep. Var. = Weekly hours of self-study in <math>t</math></b>				
Father—40-hour	2.220**	1.973**	-0.187	-0.594
workweek in $t-1$ ( $=1$ )	(1.510,2.972)	(1.305,2.642)	(-0.954,0.682)	(-1.278,0.176)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	Yes
Interaction terms	No	Yes	No	Yes
Adjusted $R^2$	0.53	0.53	0.54	0.54
Number of observations	3,223	3,223	3,124	3,124
<b>Panel B: Dep. Var. = Whether drink alcohol in <math>t</math></b>				
Father—40-hour	-0.057**	-0.045**	-0.040	-0.032
workweek in $t-1$ ( $=1$ )	(-0.080,-0.034)	(-0.069,-0.023)	(-0.079,0.002)	(-0.067,0.005)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	Yes
Interaction terms	No	Yes	No	Yes
Adjusted $R^2$	0.59	0.59	0.58	0.58
Number of observations	3,226	3,226	3,129	3,129

Note: 95% confidence intervals are in parenthesis. They are obtained using the method suggested in Cameron et al. (2008). These regressions include a constant, the monthly allowance, and whether the guardians are parents. Columns (2) and (4) also include year dummy variables interacted with each of the following: the number of siblings, birth order, the monthly allowance, the fathers' education level, and whether their guardians are the parents.

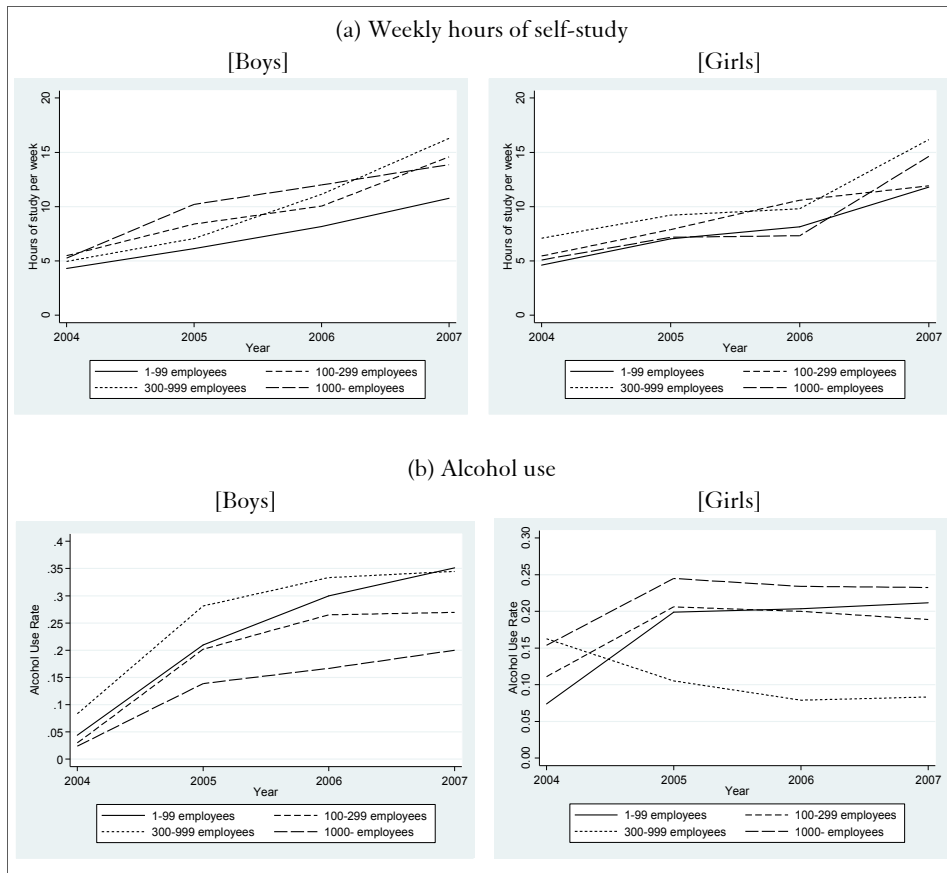
\*\* : statistically significant at the 5% level.

Table 4 shows the results of the estimation of equation (2). Panels A and B are concerned with self-study and alcohol drinking, respectively. The first two columns are for boys; the last two are for girls. In addition, columns (2) and (4) of the table control for a full set of control variables, while columns (1) and (3) exclude the interaction terms: year dummy variables interacted with each of the following: the number of siblings, birth order, the monthly allowance, the fathers' education level, and whether their guardians are the parents.

The findings in Table 4 are as follows: The new system significantly affected the boys' behavior but did not affect the girls' behavior; the interaction terms do not

make significant differences in the estimated effects. For boys, reducing the fathers' workweek by four hours increased the number of weekly self-study hours by two hours and reduced their probability of drinking alcohol by 4.5 percentage points. Based on the findings of Shin et al. (2002), Nam (2002), and Kim (2008), a decrease in the standard workweek by four hours reduces the actual hours worked by about 2.8 hours. Considering that the instrumental variable estimate is equal to the ratio of the reduced form estimate to the first-stage regression coefficient, a one hour decrease in the fathers' actual hours worked increases the boys' self-study by 0.7 ( $=1.973/2.8$ ) hours and decreases the probability of their drinking alcohol by 1.6 ( $=4.5/2.8$ ) percentage points.

[Figure 1] Youth Behavior over Time



Note: These graphs show youth behavior during the 2004-2007 period. "1-99 employees" refers to children whose fathers were employed in establishments with 1-99 employees in 2004, "100-299 employees" refers to children whose fathers were employed in establishments with 100-299 employees in 2004, etc. employed in establishments with 100-299 employees in 2004, etc.

The identification assumption of these regressions is that the children of 40-hour employees would have shown the same behavioral pattern over time as the children of 44-hour employees if the new standard workweek had not been introduced. This assumption is untestable because the behaviors of 40-hour children unaffected by the new system after the new system began cannot be observed. Nevertheless, one can check its degree of validity by examining their behaviors before the program was introduced. Figure 1 presents time-series plots of youth behaviors based on the sizes of the establishment in which their fathers were employed in 2004. Focusing on the boys' behaviors, boys who were children of 40-hour employees started to spend more time in self-study only after their fathers gained a 40-hour workweek, and before the treatment the group had similar trends to the 44-hour group. Their alcohol consumption shows a similar pattern. The increasing rate of alcohol use started to slow only after the children's fathers adopted a 40-hour workweek, and before the treatment the patterns were not that different.

5.2. Sample Attrition Analysis

[Table 5] Attrition Analysis

	Dependent variable =	
	Whether students attrited after 2004	
	Boys (1)	Girls (2)
<b>Panel A: self-study</b>		
$T_{i2004} \times 40hour_i$	0.006 (0.006)	-0.001 (0.006)
Adjusted R <sup>2</sup>	0.001	0.000
Number of observations	898	868
<b>Panel B: alcohol usage</b>		
$T_{i2004} \times 40hour_i$	-0.033 (0.167)	0.036 (0.102)
Adjusted R <sup>2</sup>	0.000	0.001
Number of observations	898	868

Note: Standard errors are in parenthesis.  $T_{i2004}$  in panel A is the weekly hours of self-study in 2004, and the variable in panel B is a dummy variable indicating whether the student drank alcohol in 2004. These regressions also include a constant,  $T_{i2004}$ , and a dummy variable indicating whether the student's father adopted a 40-hour workweek in 2004, 2005, or 2006.

Table 5 shows the results of the attrition analysis. The numbers in each cell are the estimates of  $\alpha_3$ , which show whether the students' non-response in the follow-up surveys depended on the number of weekly self-study hours and usage of alcohol in 2004, respectively. If the estimates in panel A (panel B) are significantly negative (positive), the coefficient in equation (2) could be overestimated in magnitude. If

they are significantly positive (negative), the coefficient could be underestimated in magnitude. As can be seen, none of the estimates in Table 5 are statistically significant. This implies that students' non-responses in the follow-up surveys are not correlated with their behavior in 2004 and there is no nonrandom attrition of the sample.<sup>12</sup>

### 5.3. Placebo Regression

[Table 6] Placebo Regressions

	Dependent variable =			
	Weekly hours of self-study in $t$		Whether drink alcohol in $t$	
	Boys (1)	Girls (2)	Boys (3)	Girls (4)
<b>Panel A: Restricts the analysis to the children of fathers employed in establishments with 1-99 and 100-299 employees</b>				
Father—40-hour workweek in $t-1$ ( $=1$ )	1.099 (-0.375,2.573)	0.165 (-1.492,1.822)	-0.004 (-0.028,0.022)	0.012 (-0.059,0.085)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	Yes
Adjusted $R^2$	0.31	0.31	0.39	0.36
Number of observations	2,257	2,122	2,258	2,126
<b>Panel B: Restricts the analysis to the children of fathers employed in establishments with 1-99 and 300-999 employees</b>				
Father—40-hour workweek in $t-1$ ( $=1$ )	1.069 (-1.475,3.612)	-1.226 (-3.902,1.450)	0.033 (-0.099,0.165)	-0.090 (-0.212,0.031)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	Yes
Adjusted $R^2$	0.24	0.21	0.29	0.30
Number of observations	1,355	1,331	1,355	1,333

Note: 95% confidence intervals are in parenthesis. They are obtained using the method suggested in Cameron et al. (2008). Panel A excludes the data obtained in 2007 and panel B excludes the data obtained in 2006 and 2007. These regressions also control for a constant, the monthly allowance, whether the guardians are parents, and year dummy variables interacted with each of the following: the number of siblings, birth order, the monthly allowance, the fathers' education level, and whether their guardians are the parents.

In addition to plotting Figure 1, this study conducts a placebo test. Table 6 consists of two panels: Panel A restricts the analysis to the children of fathers employed in establishments with 1-99 and 100-299 employees and assumes that a

<sup>12</sup> This study also examined whether the students' non-responses in the follow-up surveys are correlated with their background in 2004 and found no such evidence. The background includes the number of siblings, birth order at home, the monthly allowance, fathers' education level, and whether their guardians were their parents.



40-hour workweek started in 2005 for the latter group. The analysis in panel A excludes the data obtained in 2007. Panel B restricts the analysis to the children of fathers employed in establishments with 1-99 and 300-999 employees and assumes that a 40-hour workweek started in 2006 for the latter group. In addition, the analysis in panel B excludes the data obtained in 2006 and 2007. Columns (1) and (3) of the table show the results for boys, and the rest are for girls. As can be seen in the table, no estimates are statistically significant, which implies that the results in Table 4 are not driven by preexisting trends.

5.4. Robustness Checks on the Results for Boys

[Table 7] Robustness Checks for Boys

	Excludes children of fathers in companies with			With regional economic variables added
	100-299 employees (1)	300-999 employees (2)	1000-employees and in banking companies (3)	(4)
<b>Panel A: Dep. Var. = Weekly hours of self-study in <math>t</math></b>				
Father—40-hour workweek in $t-1$ (=1)	2.538** (1.653,3.532)	1.969** (1.286,2.594)	1.970** (1.185,2.732)	2.179** (1.477,2.884)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	No
Adjusted R <sup>2</sup>	0.52	0.53	0.52	0.51
Number of observations	2,744	3,096	3,082	3,223
<b>Panel B: Dep. Var. = Whether drink alcohol in <math>t</math></b>				
Father—40-hour workweek in $t-1$ (=1)	-0.038** (-0.077,-0.0004)	-0.048** (-0.074,-0.022)	-0.043** (-0.074,-0.014)	-0.057** (-0.077,-0.037)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	No
Adjusted R <sup>2</sup>	0.59	0.59	0.59	0.58
Number of observations	2,747	3,099	3,085	3,226

Note: 95% confidence intervals are in parenthesis. They are obtained using the method suggested in Cameron et al. (2008). These regressions also include a constant, the monthly allowance, whether the guardians are parents, and year dummy variables interacted with each of the following: the number of siblings, birth order, the monthly allowance, the fathers' education level, and whether their guardians are the parents. Column (4) controls for year-fixed effects and region-fixed effects instead of year-by-region fixed effects.

\*\*: statistically significant at the 5% level.

For robustness checks, this study excludes each of the 40-hour employee groups at a time. This analysis allows us to check whether the estimated effects in Table 4 were driven by only a certain group of 40-hour employees. In addition, the robustness checks enable us to examine whether a certain group leads to bias in the estimated effects. As described in Section III, this study includes employees in

establishments with 50-99 employees within the category of 100-299 employees. Since establishments with 50-99 employees adopted a 40-hour workweek in July 2007, their children were not likely to change their behavior before then. Including them in the group of 100-299 employees who adopted a 40-hour workweek in July 2006 could lead to bias. Another possibility is that anticipation effects might have biased the estimated effect in Table 4. This concern could be addressed by excluding the children of fathers who work for companies with 1,000 or more employees or banking companies from the analysis because this group is the most likely to have been affected before the new system officially began in July 2004: Banking companies began a five-day workweek in July 2002, although at that time they did not reduce the standard workweek to 40 hours.

Columns (1), (2), and (3) in Table 7 exclude the children of fathers in companies with 100-299, 300-999, and 1,000 or more employees, respectively. Panel A of the self-study analysis shows that the results in Table 4 are robust. The estimates range from 1.969 to 2.538 and are all statistically significant. In addition, panel B of the alcohol usage results are not very different from the estimate in Table 4, ranging from -0.048 to -0.038.

As the fourth robustness check, this study adds regional economic variables, namely, annual unemployment rate and the amount of value-added into the regression equation because regional economic condition may affect firms of different sizes differently, causing bias in the estimates in Table 4. Column (4) of the table shows the estimates are not that different from the estimates in Table 4. They are 2.179 and -0.057, respectively.<sup>13</sup>

## 5.5. Heterogeneous Effects on Boys' Behavior

This study examines whether reducing the fathers' workweek had different effects on different groups of children. Columns (1) and (2) of Table 8 conduct regression analyses according to fathers' education level. This is because Hamermesh et al. (2017) found that highly educated male workers were mainly affected by the new system. Fathers who have a post-high school education level are more likely to be white-collar workers, and thus, they are more likely to have shortened working hours on Saturdays and to be in a better position to monitor their children on those days. This implies that the effects should be larger for

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<sup>13</sup> As another robustness check, this study controls for the number of Saturdays on which the children attend school per month and this number interacted with the variable *H* in equation (2). This number was four in 2004, three in 2005, and two in 2006 and 2007. If the reduction in the number of Saturday schools has different effects on children as a function of the establishment size, the estimated effects in Table 4 could be biased. The coefficient of the interaction term is found to be insignificant, and no change has been made to the estimated effects in Table 4. The results are available upon request.

children of fathers with a post-high school education level than for children of fathers with an education level of high school or less. The results are as expected. The coefficients in panel A of the self-study results are 3.506 and 0.864, respectively, and the coefficients in panel B of the alcohol usage analysis are -0.087 and -0.030, respectively.

[Table 8] Heterogeneous Effects for Boys

	Father— post-high school (1)	Father—high school or less (2)	Mother works (3)	Mother does not work (4)
<b>Panel A: Dep. Var. = Weekly hours of self-study in <math>t</math></b>				
Father—40-hour workweek in $t-1$ (=1)	3.506** (2.237,4.884)	0.864** (0.040,1.743)	1.555** (0.486,2.628)	2.255** (0.720,3.969)
Individual FE	Yes	Yes	Yes	Yes
Year-by-region FE	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.56	0.51	0.58	0.70
Number of observations	1,091	2,132	1,757	1,201
<b>Panel B: Dep. Var. = Whether drink alcohol in <math>t</math></b>				
Father—40-hour workweek in $t-1$ (=1)	-0.087** (-0.133,-0.046)	-0.030** (-0.059,-0.002)	-0.067** (-0.092,-0.042)	0.011 (-0.048,0.066)
Individual FE	Yes	Yes	Yes	Yes
Year-by-region FE	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.60	0.60	0.65	0.73
Number of observations	1,092	2,134	1,758	1,203

Note: 95% confidence intervals are in parenthesis. They are obtained using the method suggested in Cameron et al. (2008). These regressions also include a constant, the monthly allowance, whether the guardians are parents, and year dummy variables interacted with each of the following: the number of siblings, birth order, the monthly allowance, and whether their guardians are the parents. Columns (3) and (4) include year dummy variables interacted with the fathers' education level.

\*\*: statistically significant at the 5% level.

Columns (3) and (4) examine the effects in relation to mothers' employment status. Working mothers may not spend much time in taking care of their children, and the effects may differ according to the status. These two columns include those whose mothers do or do not work, respectively. For self-study, the estimate in column (4), viz. 2.255, is larger than the estimate in column (3), viz. 1.555. This implies that it may be better for children's self-study for both parents to be engaged in parenting. For alcohol usage, the coefficient in column (3) is -0.067 and is statistically significant. However, the estimate in column (4) is 0.011 and is insignificant. The larger effect for those children whose mothers work implies that one parent may be sufficient to correct their alcohol usage behavior, whereas the effect of the second parent is less significant.

## 5.6. Channel for Behavior Change: Increased Monitoring and Decreased Conflict

One might wonder how reducing the fathers' workweek could have changed the boys' behavior. To answer this question, this study examines the fathers' knowledge of their children's whereabouts and activities. As described in Section I, children whose parents possess such knowledge are less likely to engage in problematic behaviors. In addition to these variables, two more variables are examined. They include whether the children experienced any conflict with their parents and the amount of time they spent talking with their fathers per day.

[Table 9] Possible Channels for Youth Behavior Change

	Dependent variable =			
	Whether father knows about my whereabouts after school and at night in $t$ (1)	Whether my father knows about my daily activities in $t$ (2)	Whether I experience conflict with my parents in $t$ (3)	The number of daily minutes spent talking with my father in $t$ (4)
<b>Panel A: Boys</b>				
Father—40-hour workweek in $t-1$ ( $=1$ )	0.110** (0.060,0.159)	0.078** (0.036,0.120)	-0.040** (-0.076,-0.003)	-1.512 (-4.947,1.705)
Individual FE	Yes	Yes	Yes	Yes
Year-by-region FE	Yes	Yes	Yes	Yes
Adjusted $R^2$	0.68	0.66	0.47	0.53
Number of observations	1,458	1,459	3,225	3,178
<b>Panel B: Girls</b>				
Father—40-hour workweek in $t-1$ ( $=1$ )	0.014 (-0.009,0.037)	-0.091** (-0.149,-0.034)	-0.014 (-0.070,0.043)	0.599 (-3.560,4.863)
Individual FE	Yes	Yes	Yes	Yes
Year-by-region FE	Yes	Yes	Yes	Yes
Adjusted $R^2$	0.73	0.67	0.49	0.53
Number of observations	1,401	1,402	3,129	3,094

Note: 95% confidence intervals are in parenthesis. They are obtained using the method suggested in Cameron et al. (2008). Columns (1) and (2) are restricted to the data obtained in 2005 and 2007, because questions about parental monitoring of their children were included only in these two years. Thus, they do not include those whose fathers worked in establishments featuring 1,000 or more employees in 2004. These regressions also include a constant, whether the guardians are parents, and year dummy variables interacted with each of the following: the number of siblings, birth order, the fathers' education level, and whether their guardians are the parents.

\*\* : statistically significant at the 5% level.

Panels A and B of Table 9 show the results for boys and girls, respectively. The dependent variable in column (1) is a dummy variable that is equal to 1 if students

chose a four or five on the five-point Likert scale in *both* of the two questions, i.e., whether their father knew about their whereabouts after school and whether their father knew about their whereabouts at night. The dependent variable in column (2) is a dummy variable that is equal to 1 if the student chose a four or five on the five-point Likert scale in response to the question about fathers' knowledge of their daily activities. The dependent variable in column (3) is a dummy variable that is equal to 1 if the student said yes to the question about whether they experienced conflict with their parents. Lastly, the dependent variable in column (4) is the number of minutes they spent talking with their fathers daily. Since the data on the parents' knowledge of their children's whereabouts and activities were obtained only in 2005 and 2007, columns (1) and (2) exclude those children whose fathers worked in establishments with 1,000 or more employees or in banking companies in 2004. Including this group may cause the true effects of reducing the standard hours to be underestimated, because the fathers' knowledge measured in 2005 may have been affected by the reduction in the workweek that took place in 2004.

Columns (1) and (2) of panel A show that reducing the fathers' workweek by four hours increased the probability of the fathers knowing about their boys' whereabouts and daily activities by 11.0 and 7.8 percentage points, respectively. Column (3) of the panel shows that the new system decreased the boys' probability of experiencing conflict with their parents by 4.0 percentage points. As described in Section I, when the fathers were away from home until 3 or 4 o'clock in the afternoon on Saturdays, it was almost impossible for them to know about their children's whereabouts and activities. Having a day off on Saturday was expected to provide them with the opportunity to monitor their children. The Time Use Survey of Statistics Korea (2014) showed that married men increased their time on Saturdays spent in household management and family member care after the new system was introduced. In 1999, they spent an average of 27 minutes on Saturday in household management and of 11 minutes in family member care, while the numbers in 2009 increased to 40 minutes and 20 minutes, respectively.<sup>14</sup> One can infer that 40-hour employees increased their time spent in these activities faster than 44-hour employees because the former had a day off on Saturdays starting in 2004. In this case, the children must inevitably have found it more difficult to engage in problematic behaviors, such as drinking alcohol. Instead, they spent more time in self-study.

Panel B shows the results for girls. As displayed, the new system did not increase their fathers' knowledge of their whereabouts and daily activities. The estimate in column (1) is positive but insignificant. The estimate in column (2) is negative. In

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<sup>14</sup> Married women spent an average of 3 hours and 39 minutes in household management in 1999, and the time was reduced to 3 hours and 23 minutes in 2009. The numbers for family member care are 55 minutes, respectively.

addition, the new system had no significant effects on the girls' probability of experiencing conflict with their parents or on the number of minutes they spent talking with their fathers daily.<sup>15</sup>

[Table 10] Influence of Father on Boys' Behavior

	(1)	(2)	(3)	(4)
<b>Panel A: Dep. Var. = Weekly hours of self-study in <math>t</math></b>				
Father knows about my whereabouts after school and at night in $t$ ( $=1$ )	1.405** (0.027,2.538)	--	--	--
Father knows about my daily activities in $t$ ( $=1$ )	--	-0.003 (-1.071,1.065)	--	--
I experience conflict with my parents in $t$ ( $=1$ )	--	--	-0.635** (-1.093,-0.139)	--
The number of daily minutes spent talking with my father in $t$	--	--	--	-0.006 (-0.015,0.003)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.68	0.68	0.53	0.53
Number of observations	1,456	1,457	3,222	3,175
<b>Panel B: Dep. Var. = Whether drink alcohol in <math>t</math></b>				
Father knows about my whereabouts after school and at night in $t$ ( $=1$ )	-0.030** (-0.055,-0.004)	--	--	--
Father knows about my daily activities in $t$ ( $=1$ )	--	0.002 (-0.006,0.010)	--	--
I experience conflict with my parents in $t$ ( $=1$ )	--	--	-0.001 (-0.025,0.023)	--
The number of daily minutes spent talking with my father in $t$	--	--	--	-0.0001 (-0.0002,0.0002)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.73	0.73	0.59	0.60
Number of observations	1,458	1,459	3,225	3,178

Note: 95% confidence intervals are in parenthesis. They are obtained using the method suggested in Cameron et al. (2008). Columns (1) and (2) are restricted to the data obtained in 2005 and 2007, because questions about parental monitoring of their children were included only in these two years. Thus, they do not include those whose fathers worked in establishments featuring 1,000 or more employees in 2004. These regressions also include a constant, the monthly allowance, whether the guardians are parents, and year dummy variables interacted with each of the following: the number of siblings, birth order, the monthly allowance, the fathers' education level, and whether their guardians are the parents.

\*\* : statistically significant at the 5% level.

<sup>15</sup> A reader commented that the change in the standard workweek may have changed the household income, which may have had an impact on youth behavior. This study estimated the effect of having a 40-hour workweek in year  $t-1$  on the household income in year  $t$  and found no significant effects. Kim (2008) also found that having a 40-hour workweek did not have any significant effect on the monthly wage, while it increased the hourly wage.

Table 10 examines which channel is effective in changing the boys' behavior. Columns (1) and (2) analyze whether the boys change their behavior when their fathers know about their whereabouts and their daily activities, respectively; and columns (3) and (4) are concerned with conflict between children and their parents and with conversation, respectively. Panel A indicates that the fathers' knowledge of their children's whereabouts and children's experiences of conflict with their parents are two effective channels to impact the self-study hours. The boys' number of weekly self-study hours increased by 1.4 when their fathers knew about their whereabouts, and these hours decreased by 0.6 when the boys experienced conflict with their parents. For alcohol usage, the only effective channel is the fathers' knowledge of their children's whereabouts. When the fathers have such knowledge, the boys' probability of drinking alcohol is reduced by 3.0 percentage points.<sup>16</sup>

## VI. Conclusion

Few studies have examined the effects of parental hours worked on children's behavior. Furthermore, those studies that have examined this issue have not properly addressed the endogeneity of the hours worked. When parents intentionally choose the number of hours worked to take care of their children, the estimated effects could lead to bias. This study uses an exogenous source for the change in the hours worked to estimate its effects on the children's behavior. The exogenous source comes from the reduction in the standard workweek from 44 hours to 40 hours that was implemented in Korea in July 2004. This study found that the reduction in the standard workweek of the fathers by four hours during the 2004-2007 period increased the boys' weekly self-study hours by two and decreased their probability of alcohol use by 4.5 percentage points. These effects resulted from the increased monitoring by the fathers and the children's decreased conflict with their parents. The new system increased the fathers' knowledge of their boys' whereabouts by 11.0 percentage points, and decreased the boys' probability of experiencing conflict with their parents by 4.0 percentage points. However, no effects were found on the girls' behavior, and the monitoring of the girls by their fathers did not increase.

Why does the reduction in the fathers' workweek have a significant effect on the monitoring of the boys, but not on that of the girls? One explanation is that fathers prefer sons to daughters (e.g., Lundberg et al., 2007; Dahl and Moretti, 2008).

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<sup>16</sup> Appendix Tables 1, 2, and 3 show the results for girls, which correspond to Tables 7, 8, and 10, respectively. No significant effects were found in Appendix Tables 7 and 8. Appendix Table 10 indicates that fathers' knowledge about their whereabouts and conflicts with parents have significant effects on girls' behaviors.

According to Lundberg et al. (2007), boys born to unmarried parents are more likely than girls to use the father's surname and fathers who are married when their child is born are more likely to live with a son than with a daughter one year after birth. Another explanation is that sons have a higher return to education, making fathers take more care of sons than daughters. Becker and Tomes (1976) asserted that parents invest more in children with a higher marginal return to education: Considering that sons have higher returns than daughters, fathers are more likely to increase the monitoring of sons rather than of daughters.



Appendix

[Appendix Table 1] Robustness Checks for Girls

	Excludes children of fathers in companies with			With regional economic variables added
	100-299 employees (1)	300-999 employees (2)	1000-employees and in banking companies (3)	(4)
<b>Panel A: Dep. Var. = Weekly hours of self-study in <math>t</math></b>				
Father—40-hour workweek	0.066	-0.731	-0.557	-1.154
in $t-1$ (=1)	(-0.631,0.745)	(-1.480,0.098)	(-1.240,0.143)	(-1.854,0.377)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	No
Adjusted $R^2$	0.53	0.54	0.54	0.52
Number of observations	2,735	2,970	2,933	3,124
<b>Panel B: Dep. Var. = Whether drink alcohol in <math>t</math></b>				
Father—40-hour workweek	-0.040	-0.018	-0.032	-0.032
in $t-1$ (=1)	(-0.091,0.014)	(-0.045,0.007)	(-0.077,0.017)	(-0.062,0.005)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	No
Adjusted $R^2$	0.59	0.58	0.57	0.57
Number of observations	2,740	2,975	2,938	3,129

Note: 95% confidence intervals are in parenthesis. They are obtained using the method suggested in Cameron et al. (2008). These regressions also include a constant, the monthly allowance, whether the guardians are parents, and year dummy variables interacted with each of the following: the number of siblings, birth order, the monthly allowance, the fathers' education level, and whether their guardians are the parents. Column (4) controls for year-fixed effects and region-fixed effects instead of year-by-region fixed effects.

\*\* : statistically significant at the 5% level.

[Appendix Table 2] Heterogeneous Effects for Girls

	Father— post-high school (1)	Father—high school or less (2)	Mother works (3)	Mother does not work (4)
<b>Panel A: Dep. Var. = Weekly hours of self-study in <math>t</math></b>				
Father—40-hour workweek in $t-1$ ( $=1$ )	-0.680 (-1.574,0.269)	-0.092 (-0.847,0.835)	-1.477 (-2.650,0.150)	-0.292 (-1.249,1.294)
Individual FE	Yes	Yes	Yes	Yes
Year-by-region FE	Yes	Yes	Yes	Yes
Adjusted $R^2$	0.60	0.51	0.60	0.69
Number of observations	935	2,189	1,628	1,262
<b>Panel B: Dep. Var. = Whether drink alcohol in <math>t</math></b>				
Father—40-hour workweek in $t-1$ ( $=1$ )	-0.064 (-0.153,0.025)	-0.018 (-0.059,0.023)	-0.007 (-0.067,0.055)	-0.020 (-0.079,0.036)
Individual FE	Yes	Yes	Yes	Yes
Year-by-region FE	Yes	Yes	Yes	Yes
Adjusted $R^2$	0.57	0.60	0.65	0.
Number of observations	936	2,193	1,630	1,264

Note: 95% confidence intervals are in parenthesis. They are obtained using the method suggested in Cameron et al. (2008). These regressions also include a constant, the monthly allowance, whether the guardians are parents, and year dummy variables interacted with each of the following: the number of siblings, birth order, the monthly allowance, and whether their guardians are the parents. Columns (3) and (4) include year dummy variables interacted with the fathers' education level.

\*\*: statistically significant at the 5% level.

**[Appendix Table 3]** Influence of Father on Girls' Behavior

	(1)	(2)	(3)	(4)
<b>Panel A: Dep. Var. = Weekly hours of self-study in <math>t</math></b>				
Father knows about my whereabouts after school and at night in $t$ ( $=1$ )	1.524** (0.902,2.148)	--	--	--
Father knows about my daily activities in $t$ ( $=1$ )	--	-0.043 (-0.232,0.147)	--	--
I experience conflict with my parents in $t$ ( $=1$ )	--	--	-0.153 (-0.708,0.366)	--
The number of daily minutes spent talking with my father in $t$	--	--	--	-0.013** (-0.019, -0.007)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	Yes
Adjusted $R^2$	0.70	0.70	0.54	0.54
Number of observations	1,398	1,399	3,124	3,089
<b>Panel B: Dep. Var. = Whether drink alcohol in <math>t</math></b>				
Father knows about my whereabouts after school and at night in $t$ ( $=1$ )	-0.015** (-0.027, -0.004)	--	--	--
Father knows about my daily activities in $t$ ( $=1$ )	--	-0.017 (-0.037,0.002)	--	--
I experience conflict with my parents in $t$ ( $=1$ )	--	--	0.041** (0.023,0.058)	--
The number of daily minutes spent talking with my father in $t$	--	--	--	-0.000 (-0.001,0.000)
Individual fixed effects	Yes	Yes	Yes	Yes
Year-by-region fixed effects	Yes	Yes	Yes	Yes
Adjusted $R^2$	0.77	0.77	0.58	0.58
Number of observations	1,401	1,402	3,129	3,094

Note: 95% confidence intervals are in parenthesis. They are obtained using the method suggested in Cameron et al. (2008). Columns (1) and (2) are restricted to the data obtained in 2005 and 2007, because questions about parental monitoring of their children were included only in these two years. Thus, they do not include those whose fathers worked in establishments featuring 1,000 or more employees in 2004. These regressions also include a constant, the monthly allowance, whether the guardians are parents, and year dummy variables interacted with each of the following: the number of siblings, birth order, the monthly allowance, the fathers' education level, and whether their guardians are the parents.

\*\* : statistically significant at the 5% level.

## References

- Aughinbaugh, A., and M. Gittleman (2004), "Maternal Employment and Adolescent Risky Behavior," *Journal of Health Economics*, 23(4), 815-838.
- Bahr, S. et al. (2005), "Parental and Peer Influences on the Risk of Adolescent Drug Use," *Journal of Primary Prevention*, 26(6), 529-551.
- Barnes, G., and M. Farrell (1992), "Parental Support and Control as Predictors of Adolescent Drinking, Delinquency, and Related Problem Behaviors," *Journal of Marriage and Family*, 54(4), 763-776.
- Becker, G. S., and N. Tomes (1976), "Child Endowments and the Quantity and Quality of Children," *Journal of Political Economy*, 84(4), S143-S162.
- Bertrand, M. et al. (2004), "How Much Should We Trust Differences-In-Differences Estimates?" *Quarterly Journal of Economics*, 119(1), 249-275.
- Bingham, C. R. et al. (2009), "Crash Types: Markers of Increased Risk of Alcohol-involved Crashes among Teen Drivers," *Journal of Studies on Alcohol and Drugs*, 70(4), 528-535.
- Cameron, A. C. et al. (2008), "Bootstrap-based Improvements for Inference with Clustered Errors," *Review of Economics and Statistics*, 90(3), 414-427.
- Christie-Mizell, C. et al. (2011), "Bullying Behavior, Parents' Work Hours and Early Adolescents' Perceptions of Time Spent with Parents," *Youth & Society*, 43(4), 1570-1595.
- Dahl, G., and E. Moretti, (2008), "The Demand for Sons," *Review of Economic Studies*, 75(4), 1085-1120.
- Dembe, A. E., (2005), "The Impact of Overtime and Long Work Hours on Occupational Injuries and Illnesses: New Evidence from the United States," *Occupational and Environmental Medicine*, 62(9), 588-597.
- Finn, C. E., Jr. (2010, March 20), "The Case for Saturday School," *The Wall Street Journal*. Retrieved from <http://online.wsj.com>.
- Fleck, S. E. (2009), "International Comparisons of Hours Worked: An Assessment of the Statistics," *Monthly Labor Review*, 132(5), 3-31.
- Fox, L. E. et al. (2013), "Time for Children: Trends in the Employment Patterns of Parents, 1967-2009," *Demography*, 50(1), 25-49.
- Gottfredson, M. R., and T. Hirschi (1990), *A General Theory of Crime*, Stanford: Stanford University Press.
- Grubb, D. et al. (2007), "Addressing Labour Market Duality in Korea," OECD Social, Employment and Migration Working Papers No. 61, Organization for Economic Cooperation and Development.
- Hallberg, D., and A. Klevmarken, (2003), "Time for Children: A Study of Parent's Time Allocation," *Journal of Population Economics*, 16(2), 205-226.
- Hamermesh, D. S. et al. (2017), "Does Labor Legislation Benefit Workers? Well-being after an Hours Reduction," *Journal of the Japanese and International Economies*, 44, 1-12.
- Harrington, J. M. (2001), "Health Effects of Shift Work and Extended Hours of Work," *Occupational and Environmental Medicine*, 58(1), 68-72.

- Hart, R. A., and T. Sharot (1978), "The Short-run Demand for Workers and Hours: A Recursive Model," *Review of Economic Studies*, 45(2), 299-309.
- Hirschi, T. (1969), *Causes of Delinquency*, Berkeley: University of California Press.
- Hunt, J. (1999), "Has Work-Sharing Worked in Germany?" *Quarterly Journal of Economics*, 114(1), 117-148.
- Kang, C., and S. H. Lee (2015), "Being Knowledgeable or Sociable? Different Patterns of Human Capital Development and Evaluation in Cognitive and Non-Cognitive Skills," *Korean Economic Review*, 31(1), 57-87.
- Kawaguchi, D., et al. (2013), "A Gift of Time," *Labour Economics*, 24, 205-216.
- Kim, S. et al. (2005), "Analysis of Youth Drinking Alcohol," (written in Korean) National Youth Commission Working Paper 2005-21.
- Kim, Y. (2008), "The Effects of Legal Working Hours on Actual Hours Worked, Employment, and Wage," (written in Korean) *Korean Journal of Labor Studies*, 14(2), 1-21.
- \_\_\_\_\_ (2011), "The Effect of 40-hour Work Week System on Leisure of Workers," (written in Korean), *Korean Journal of Labor Studies*, 17(1), 37-70.
- Lee, S. et al. (2007), *Working Time around the World: Trends in Working Hours, Laws, and Policies in a Global Comparative Perspective*, New York, NY: Routledge.
- Lee, Y. (2015), "The Effects of Working Hour Reduction on Workers' Lifestyle and Working Conditions," (written in Korean). *Korean Journal of Economic Studies*, 63(2), 37-64.
- Livingston, J. A. et al. (2010), "Can Parents Prevent Heavy Episodic Drinking by Allowing Teens to Drink at Home?" *Addictive Behaviors*, 35(12), 1105-1112.
- Lundberg, S. et al. (2007), "Child Gender and Father Involvement in Fragile Families," *Demography*, 44(1), 79-92.
- Nam, S. (2002), "An Empirical Analysis on Macroeconomic Effects of the Proposed Reduction of Legal Working Hours in Korea," (written in Korean), *Korean Journal of Labor Economics*, 25(2), 33-78.
- OECD (2015), "Average Usual Weekly Hours Worked on the Main Job," (electronic file). Downloadable from [http://stats.oecd.org/Index.aspx?DatasetCode=AVE\\_HRS](http://stats.oecd.org/Index.aspx?DatasetCode=AVE_HRS).
- Park, C. (2014), "A Study of the Non-market Effects of Five-day Workweek," (written in Korean), *Korean Journal of Labor Economics*, 37(4), 59-88.
- Pyo, H. et al. (2016), "Firm Size and Job Creation in Korea: Do Small Businesses Create More Jobs?" *Korean Economic Review*, 32(1), 137-166.
- Rapoport, B., and C. Le Bourdais (2008), "Parental Time and Working Schedules," *Journal of Population Economics*, 21(4), 903-932.
- Ryan, S. et al. (2010), "Parenting Factors Associated with Reduced Adolescent Alcohol Use: A Systematic Review of Longitudinal Studies," *Royal Australian and New Zealand Journal of Psychiatry*, 44(9), 774-783.
- Sandberg, J. F., and S. L. Hofferth (2001), "Changes in Children's Time with Parents: United States, 1981-1997," *Demography*, 38(3), 423-436.
- Shin, K. et al. (2002), "The Effects of Working Hours Reduction in Korea," (written in Korean), *Korean Journal of Labor Economics*, 25(3), 1-34.

- Statistics Korea (2014), "Time Use Survey," (written in Korean), Downloadable from [http://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT\\_1TM1063Z&conn\\_path=I2](http://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT_1TM1063Z&conn_path=I2).
- Wagenaar, A. C., et al. (1993), "Where and How Adolescents Obtain Alcoholic Beverages," *Public Health Reports*, 108(4), 459-464.
- Wood, M. et al. (2004), "Do Parents Still Matter? Parent and Peer Influences on Alcohol Involvement among Recent High School Graduates," *Psychology of Addictive Behaviors*, 18(1), 19-30.