While the Cat's Away, Do the Mice Play? Maternal Employment and the After-School Activities of Adolescents*

Leonard M. Lopoo, *Syracuse University*

Objective. This study determines if a relationship exists between a mother's employment and the activities in which her adolescent children participate after school. *Methods.* The author uses panel data from the 1996 Survey of Income and Program Participation with logit and fixed-effects logit models to estimate this relationship. *Results.* Fixed-effects models suggest a positive relationship between maternal employment and participation in lessons after school for the adolescent children of married women and also for those with at least a high school education. Maternal employment is also positively related to sports participation for the adolescent children of unmarried mothers. *Conclusions.* First, this article shows the importance of accounting for unobserved heterogeneity in inquiries into the links between maternal employment and adolescent outcomes. Second, it suggests that high-socioeconomic-status mothers may use after-school activities, particularly lessons, as a form of after-school care, while unmarried mothers may use sports.

In 2002, mothers with children under the age of six were nearly five times more likely to work than were similar mothers in 1950 (U.S. House of Representatives, 2004). This increase in maternal employment, coupled with changes in family structure, has led to a rapid rise in the number of preschool children who are in child-care arrangements (Hofferth, 1996). Although much attention is paid to mothers with young children, during this same period the labor force participation of mothers with children aged six to 17 also increased dramatically, from 32.8 percent to 78.6 percent (U.S. House of Representatives, 2004), creating child-care needs for this group as well. As documented below, there is considerable evidence that maternal employment increases the probability that an adolescent child will spend some time in self-care, that is, at home without adult supervision. It also seems reasonable to hypothesize that working mothers may be more inclined to encourage their adolescent children to participate in after-school activities, such as athletic teams or the drama club, both as a form of

*Direct correspondence to Leonard M. Lopoo, Department of Public Administration, The Maxwell School, 426 Eggers Hall, Syracuse University, Syracuse, NY 13244 ⟨lmlopoo@maxwell.syr.edu⟩. For purposes of replication, the author will share all data and coding information. The author is grateful to Dan Black and Tom DeLeire for helpful conversations and to Martha Bonney and anonymous reviewers for insightful comments made on an earlier version of this article.

SOCIAL SCIENCE QUARTERLY, Volume 88, Number 5, December 2007

enrichment and as a source of after-school care. The objective of this research, therefore, is to ask if maternal employment is related to the activities in which an adolescent child participates after school.

Previous Research

Theoretically, one might expect maternal employment to have negative consequences for adolescent children if it decreases a mother's ability to supervise her children's behavior (Haveman and Wolfe, 1994, 1995) or if it reduces her time to devote to parenting. Of course, there are potentially many benefits to be gained when a mother works. For instance, maternal employment could increase parental resources, thereby allowing increased investment in children and reducing the stress in the parent-child relationship (Chase-Lansdale et al., 2003; Mayer, 1997). Further, an employed mother may serve as a role model for her children, perhaps especially for her daughters (Chase-Lansdale et al., 2003; Haveman and Wolfe, 1994, 1995; Morris et al., 2001). If a young woman wants to imitate her working mother and enter the labor force, she might avoid many risky behaviors, such as dropping out of high school or having unprotected sexual intercourse. Thus, this role model mechanism may endow maternal employment with some benefits as well.

There is a small and growing empirical literature on maternal employment and adolescent outcomes that uses a variety of data sources and methods. In a meta-analysis of several welfare experimental designs, Gennetian et al. (2002) find that social welfare programs with an employment component are negatively related to a variety of education outcomes for adolescents. They suggest that the adolescents in these demonstrations may perform poorly because they are more likely to spend time watching younger siblings. Chase-Lansdale et al. (2003) use longitudinal data from the three-city study and find no relationship between transitions from welfare to maternal employment and cognitive and behavioral outcomes, while they do find a weak positive relationship with some psychological outcomes, anxiety, for instance.

Interestingly, a handful of recent studies suggest that the effects of maternal employment on some adolescent outcomes may differ by the socioeconomic status of the parents. Lopoo (2004, 2005a) finds a positive relationship between maternal employment and teenage childbearing for high-socioeconomic-status adolescents and a negative relationship for low-socioeconomic-status adolescents. Ruhm (2005) finds similar results for a variety of cognitive measures, as well as a measure of body weight: negative effects for advantaged 10- to 11-year-olds and positive effects of maternal employment for disadvantaged adolescents.

The research on maternal employment and adolescent outcomes is growing; however, there have been limited empirical inquiries into the

mechanisms that would explain these relationships. The lone exception is research that has consistently shown that maternal employment increases the likelihood that a child will spend some time at home after school without adult supervision, sometimes known as the ''latchkey kid'' phenomenon (Cain and Hofferth, 1989; Casper and Smith, 2002, 2004; Lopoo, 2005b; Rodman and Pratto, 1987; Smith, 2002; Vandivere et al., 2003). Spending time at home alone is associated with a variety of negative outcomes: the use of illegal substances (Aizer, 2004; Cohen et al., 2002; Richardson et al., 1993), skipping school, stealing, and harming others (Aizer, 2004). Latchkey kids also have higher rates of sexual intercourse and, among males, sexually transmitted diseases (Cohen et al., 2002). Others have noted a relationship between unsupervised time and depression and unsupervised time and poor academic performance (Richardson et al., 1993). Collectively, then, the literature suggests that maternal employment might produce negative outcomes for adolescents through a greater propensity for them to spend time unsupervised.

However, to the best of my knowledge, no one has asked if maternal employment causes mothers to enroll their children in enrichment activities, such as sports or music lessons, which might have a countervailing influence, perhaps even compensating for the negative influence of self-care. The Census Bureau (U.S. Bureau of the Census, 2003a, 2003b) has published detailed tables from Waves 6 and 12 of the 1996 Survey of Income and Program Participation (SIPP) showing that, on average, parents who work have children who are more likely to participate in sports, clubs, and lessons than the children of nonworking parents. Of course, working mothers are different from nonworking mothers in a variety of dimensions, making it difficult to determine the impact employment has on these activities. This study aims to fill this gap in the literature by asking if the adolescent children of working mothers are more likely to engage in a variety of after-school activities. As such, it should improve our understanding of the links between maternal employment and adolescent outcomes.

Data

The 1996 SIPP, the data source for this analysis, is a nationally representative sample of individuals from the civilian, noninstitutionalized population. Beginning in April 1996, the SIPP collected demographic, employment, and program participation data from all individuals aged 15 and older in randomly selected households. Individuals were interviewed every four months (which constitutes one wave) and asked questions about the preceding four months. The final wave was completed in March 2000.

In addition to the core questions, which were repeated every four months, each wave included a set of unique questions, which are collectively called a topical module. Unlike the core questions, the questions in the topical

modules were often only asked once or twice during the entire panel. This study makes use of the "Children's Wellbeing" topical module, which asked a designated parent about the after-school activities for all of his or her children between the ages of five and 17 during the sixth (November 1997 to February 1998) and twelfth waves (November 1999 to February 2000). Specifically, in the Children's Wellbeing topical module, the designated parent[1] was asked the following questions: "Is [child name] on a sports team either in or out of school?"; "Does [child name] take lessons after school or on weekends in subjects like music, dance, language, computers, or religion?"; and "Does [child name] participate in any clubs or organizations after school or on weekends, such as Scouts, a religious group, or a Girls or Boys Club?"[2] The topical module also included information on the child's race, age, and sex.

Given the focus of this analysis on adolescent children, I selected all children between the ages of 10 and 17. Using the mother's person number, I merged information from Waves 6 and 12 of the core SIPP files to the child-level information from the topical module. In the SIPP core, each respondent was asked if she worked. If she responded affirmatively, she was asked "How many hours per week did . . . usually work at all activities at this job?" for up to two different jobs. I summed the reported weekly work hours to create the maternal work hour measure. The core file also included information on the mother's age, a categorical measure of her education, her marital status, and the number of adults and children in the household. The final sample consists of 13,069 person-wave observations from 7,678 different individuals. Table 1 contains weighted descriptive statistics for the SIPP sample.

Empirical Strategy

I use the following logit model to estimate the relationship between maternal employment and after-school activities for adolescent i in wave t:

$$\text{Prob}(Y_{it} = 1) = \Lambda(\boldsymbol{\beta}_0 + \mathbf{W}'_{it}\boldsymbol{\beta}_1 + \mathbf{X}'_{it}\boldsymbol{\beta}_2 + \mathbf{Z}'_{i}\boldsymbol{\beta}_3), \quad (1)$$

where Y is an indicator equal to 1 if the adolescent participated in a particular activity; Λ represents the logistic cumulative distribution function; $\mathbf{W}$ is a vector containing two indicator variables: the first equal to 1 if the mother worked less than or equal to 30 hours and the second equal to 1 if

[1]In nearly every instance, the designated parent was the mother. For example, in Wave 12, 98 percent of the designated parents were mothers (Lugaila, 2003).

[2]All SIPP questions taken from data dictionaries found at ⟨http://www.bls.census.gov/sipp_ftp.html#sipp96⟩. These activity questions are used by Lugaila in her report on extracurricular activities (2003:10–12). Since the clubs and lessons questions explicitly include activities on the weekends, these variables are imperfect measures of after-school activities. It is difficult to know if the inclusion of these weekend activities is biasing the estimates and, if so, in which direction.

TABLE 1

Weighted Descriptive Statistics from 1996 SIPP

	Mean (*SD*)
Sports	0.388
	(0.487)
Lessons	0.297
	(0.457)
Clubs	0.356
	(0.479)
Maternal work hours	27.82
	(20.14)
Child female	0.487
	(0.500)
Child's age	13.05
	(2.12)
African American	0.153
	(0.360)
Asian/Pacific Islander	0.036
	(0.187)
American Indian	0.018
	(0.132)
Mother's age	39.84
	(5.85)
Mother has less than a HS education	0.169
	(0.375)
Mother has HS education	0.313
	(0.464)
Mother has some college	0.324
	(0.468)
Mother never married	0.060
	(0.238)
Mother married	0.748
	(0.434)
Number of adults in household	2.11
	(0.804)
Number of children in household	2.45
	(1.28)
N	13,069

NOTE: Data are weighted by person weight in the topical module from Wave 12.

the mother worked more than 30 hours;[3] nonworking mother is the omitted category; **X** is a vector of time-varying background characteristics; and **Z** is a vector of time-invariant background characteristics. More specifically, **X** consists of the adolescent's age and age-squared, the mother's age, education

[3]The literature on adolescent self-care consistently shows that the relationship between maternal employment and adolescent outcomes is nonlinear, with a positive effect when mothers work full time and either a smaller positive effect or no effect when mothers work part time (Casper and Smith, 2004; Lopoo, 2005b; Vandivere et al., 2003).

(indicators for less than high school, high school, and some college; a college degree or more is the omitted category), marital status (indicators for never married and married; divorced, separated, or widowed is the omitted category), as well as the number of adults and the number of children in the mother's household. The vector $\mathbf{Z}$ consists of the adolescent's sex and race (indicators for African American, Asian or Pacific Islander, and American Indian; white is the omitted category). For all the models, I report robust standard errors and correct the standard errors to account for intra-family correlation since some families had multiple children in the data.

If employment hours were randomly assigned to mothers, the random assignment should preclude systematic differences in the unobserved characteristics of adolescents with working and nonworking mothers. Therefore, any differences in the proportion of adolescents participating in an after-school activity by the employment status of their mothers could be attributed to employment. In this case, the estimate of $\boldsymbol{\beta}_1$ would not be biased. It is well established in the literature, however, that maternal employment is nonrandom, and that mothers with high education levels and Armed Forces Qualification Test (AFQT) scores are more likely to work than their counterparts (Lopoo, 2005b; Ruhm, 2004; Waldfogel, Han, and Brooks-Gunn, 2002). If the unobserved factors in this analysis also differ by the employment status of the mother and are correlated to the outcome, then one should be concerned about omitted variables biasing the estimate of $\boldsymbol{\beta}_1$ (Moffitt, 2005).

If one separates the unobserved time-invariant individual characteristics, η, from the error term for each individual in Equation (1), one could model the probability of each after-school activity with Chamberlain's (1980) fixed-effects logit model (FE logit):

$$\text{Prob}(Y_{it} = 1) = \Lambda(\boldsymbol{\gamma}_0 + \mathbf{W}'_{it}\boldsymbol{\gamma}_1 + \mathbf{X}'_{it}\boldsymbol{\gamma}_2 + \mathbf{Z}'_{i}\boldsymbol{\gamma}_3 + \eta_i). \quad (2)$$

The fixed-effects logit model includes the same list of covariates as the logit model. The model uses variation within an individual over time (factors that do not vary over time are unidentified). As a result, in some sense, it "controls" for the unobserved factors that are constant over time within an individual (η) and that are correlated with both maternal work hours and the likelihood of participating in an after-school activity. Thus, these time-invariant, unobserved factors should not bias the coefficient estimates for maternal work hours, $\boldsymbol{\gamma}_1$.[4]

[4]One potentially important factor that is not explicitly controlled in this model is family income. Several authors who have studied parental income and its influence on children advocate using a family's permanent income, which is fixed over time (e.g., Mayer, 1997; Solon, 1992). Since the fixed-effects model removes all factors that are constant over time within individuals, the maternal employment estimate should not be biased by the omission of permanent income in the model. Of course, the maternal employment measure may be capturing changes due to the transitory component of income. Controlling for the transitory component of income is not a straightforward decision since income is endogenous. Presumably, maternal employment is increasing income and an income change might influence the outcome. In this instance, one would not want to control for income in the models since

This fixed-effects logit model represents an improvement over the Equation (1) specification, but it is not flawless. Any factor that varies across time within individuals but that is omitted from the model may continue to bias coefficient estimates for maternal work hours. Another weakness of the fixed-effects logit model is that the likelihood function assumes variation in the outcome (Hamerle and Ronning, 1995). Individuals who do not have changes in their participation in a given outcome over time (either never participating or always participating) are not used to identify the maternal work hours coefficient and are discarded, which reduces the sample size. Inasmuch as the individuals without variation in the outcome are different from those with variation, the results may not be generalizable.[5]

Results

In Table 2, results from the logit model (Logit A) show a positive and statistically significant relationship between maternal work hours and sports participation. Compared to the children of mothers who are not working, the children of mothers who work one to 30 hours are 4 percentage points more likely to participate in sports, while the children of mothers who work more than 30 hours are 4.9 percentage points more likely to participate in sports.[6] The coefficient estimate for maternal employment is much smaller and statistically insignificant in both the logit model of participation in lessons and in participation in clubs.

If there are time-invariant omitted factors that are correlated to the outcome and maternal work hours, then the estimates reported in the logit models are biased. Hence, I also report results from a fixed-effects logit

it follows maternal employment in the causal chain, that is, one would not want to separate its influence from that of maternal employment. If, however, it is income (or the lack thereof) that is causing mothers to work and income influences the outcome, then one should control for income in the models. To do otherwise would create biased estimates of the maternal employment coefficient. I report results excluding total family income; however, I also ran fixed-effects models (results available on request) including total family income, and the results are nearly identical to those reported below.

[5]The reduction in sample size will also increase standard errors, all else equal. Thus, one is more likely to commit a Type II error simply due to the loss of precision.

[6]To generate these "marginal effect estimates," or the difference in probability between an employment category and the probability for nonworking mothers, I calculate the partial derivative of the probability of an outcome (P) with respect to maternal employment: $P * (1 - P) * \beta_1$. For the logit models, one could predict P for every individual outcome and use the mean predicted probability to generate an estimate of P. Although the partial derivative is the same for the fixed-effects logit model, one cannot predict the probability of the outcome for each adolescent because the adolescent-specific fixed effect is unidentified. To maintain consistency for both models, therefore, I substituted the sample proportion for P when calculating the marginal effect. I then multiplied the marginal effect by 100 to generate a percentage point change. For the model of sports participation, the marginal effect for maternal employment between one and 30 hours is $0.388 * 0.612 * 0.169 = 0.04$. I report marginal effects for maternal employment in Tables 2 and 3 in brackets.

TABLE 2

Logit and Fixed-Effects Logit Models of Probability of After-School Activities Using Full Sample and Analytical Sample from Fixed-Effects Logit

	Sports			Lessons			Clubs		
	Logit A	FE Logit	Logit B	Logit A	FE Logit	Logit B	Logit A	FE Logit	Logit B
Mother works less than or equal to 30 hours	0.169*	0.253	0.106	0.013	0.303	0.104	0.057	0.111	0.050
	(0.072)	(0.175)	(0.088)	(0.079)	(0.208)	(0.097)	(0.077)	(0.182)	(0.094)
	[0.040]	[0.060]	[0.025]	[0.003]	[0.063]	[0.022]	[0.013]	[0.025]	[0.011]
Mother works more than 30 hours	0.208**	0.137	0.030	−0.085	0.339	0.093	−0.009	0.089	0.020
	(0.058)	(0.164)	(0.062)	(0.062)	(0.193)	(0.062)	(0.060)	(0.171)	(0.059)
	[0.049]	[0.033]	[0.007]	[−0.018]	[0.071]	[0.019]	[−0.002]	[0.020]	[0.005]
Child female	−0.481**	—	0.002	0.510**	—	−0.010	0.279**	—	−0.005
	(0.043)		(0.009)	(0.044)		(0.008)	(0.043)		(0.005)
Child's age	0.748**	1.626**	1.559**	0.185	−0.117	−0.019	0.084	0.841	0.224
	(0.109)	(0.540)	(0.259)	(0.119)	(0.409)	(0.265)	(0.111)	(0.600)	(0.242)
Child's age squared	−0.029**	−0.048**	−0.060**	−0.011*	−0.004	−0.002	−0.004	−0.009	−0.010
	(0.004)	(0.007)	(0.010)	(0.005)	(0.008)	(0.010)	(0.004)	(0.007)	(0.009)
African American	−0.327**	—	0.036	−0.116	—	−0.001	−0.214**	—	−0.014
	(0.074)		(0.022)	(0.082)		(0.020)	(0.076)		(0.018)
Asian/Pacific Islander	−0.555**	—	0.016	0.204	—	0.009	−0.241	—	0.018
	(0.142)		(0.026)	(0.139)		(0.023)	(0.146)		(0.016)
American Indian	−0.399*	—	0.021	−0.646**	—	0.063	−0.266	—	0.018
	(0.172)		(0.037)	(0.231)		(0.033)	(0.208)		(0.022)
Mother's age	−0.001	−0.450	−0.003	0.020**	0.071	0.000	0.009	−0.680	−0.001
	(0.005)	(0.504)	(0.002)	(0.005)	(0.351)	(0.002)	(0.005)	(0.561)	(0.002)
Mother has less than a HS education	−1.184**	−2.199	−0.005	−1.269**	14.844**	0.073*	−1.348**	1.953	0.018
	(0.089)	(1.314)	(0.027)	(0.099)	(1.241)	(0.033)	(0.098)	(1.411)	(0.025)
	−0.686**	−1.475	−0.001	−0.835**	14.947**	0.010	−0.697**	1.135	0.010

TABLE 2—continued

	Sports			Lessons			Clubs		
	Logit A	FE Logit	Logit B	Logit A	FE Logit	Logit B	Logit A	FE Logit	Logit B
Mother has HS education	(0.070)	(0.955)	(0.021)	(0.072)	(1.167)	(0.018)	(0.071)	(0.943)	(0.016)
Mother has some college	−0.422**	0.126	0.006	−0.372**	1.270	−0.003	−0.366**	0.615	0.002
	(0.067)	(0.598)	(0.021)	(0.069)	(1.104)	(0.017)	(0.068)	(0.855)	(0.019)
Mother never married	0.129	0.380	−0.011	−0.107	0.456	0.025	−0.139	−0.028	−0.034
	(0.115)	(0.621)	(0.069)	(0.133)	(0.813)	(0.071)	(0.126)	(0.671)	(0.065)
Mother married	0.446**	0.148	−0.003	0.492**	0.361	0.088	0.386**	−0.437	−0.067
	(0.068)	(0.277)	(0.051)	(0.079)	(0.275)	(0.055)	(0.072)	(0.301)	(0.052)
Number of adults in household	−0.084*	−0.005	0.017	−0.107*	−0.136	−0.045	−0.095**	0.004	0.006
	(0.033)	(0.094)	(0.035)	(0.042)	(0.107)	(0.035)	(0.035)	(0.106)	(0.036)
Number of children in household	−0.062**	−0.162	−0.017	−0.064*	−0.025	0.008	−0.011	−0.035	−0.003
	(0.023)	(0.098)	(0.013)	(0.025)	(0.102)	(0.014)	(0.023)	(0.108)	(0.012)
N	13,069	3,464	3,464	13,069	3,226	3,226	13,069	3,584	3,584

NOTES: **$p < 0.01$; *$p < 0.05$; robust standard errors reported in parentheses; standard errors corrected for intra-family correlation; marginal effects for maternal employment coefficients reported in brackets.

model in Table 2. Although the coefficient estimates for both maternal employment variables in the logit model of sports participation are statistically significant, once the fixed effect is removed, they are no longer statistically distinguishable from zero. For the lessons outcome, the maternal employment coefficients are positive and relatively large in the fixed-effects logit model, although they remain statistically insignificant. Likewise, the relationship is insignificant in the fixed-effects logit model of club participation.

If one examines the coefficients carefully, a couple of other findings are noteworthy. First, with the exception of the coefficient for mother works more than 30 hours in the sports model, the coefficients are actually larger in the fixed-effects models, suggesting an omitted factor or factors that were biasing the coefficients downward. Of course, the sample is different using the fixed-effects logit model, and that could also explain the change in the point estimates. Second, the standard errors are considerably larger in the fixed-effects logit. It is difficult to determine if this increase in the standard error results from less precision in the estimates or is simply due to the decline in sample size caused by these fixed-effects logit models. As explained earlier, the fixed-effects models identify the maternal employment coefficient using only the adolescents who had a change in their after-school activities over time, implying smaller samples than one would find using pooled data. The reduction in the sample size will, all else equal, increase the standard errors.

In Table 2, I added a third column for every outcome. In this column I report results from a logit model (Logit B) using the analytical sample from the fixed-effects logit. By comparing the results across the logit models, one can determine how much the reduction in sample size (i.e., the different sample) influenced the estimates, holding the model constant. By comparing the results from the logit with the smaller sample (Logit B) to the fixed-effects results, one can determine the importance of the removal of the fixed effects, holding sample size constant.

For the sports outcome, the reduction in sample size (comparing Logit A to Logit B) shows an expected increase in the standard errors, but the size of the increase is small in comparison to the change in the standard errors found when comparing the results from Logit B to the fixed-effects logit. Comparing the coefficient estimates in Logit A and Logit B shows a large decline in magnitude, suggesting that the sample composition may be different. However, removing the fixed effects, while holding the sample constant, creates quite a large increase in the coefficients. Collectively, these results suggest that the reduction in sample size is not the reason for the increase in the standard errors: it appears to be a lack of precision. It also suggests that the removal of the fixed effect does reduce the downward bias caused by omitted variables. In fact, the bias may be even larger than one would recognize simply comparing the results from Logit A to the fixed-effects logit.

In the lessons models, one finds a similar pattern for the standard errors. The standard errors are much larger in the FE Logit model compared to the results from Logit A. By comparing the standard errors in Logit A to Logit B, we see that this change is not the result of sample reduction. The standard errors are nearly the same for both results. Comparing the results from Logit B to the FE Logit model, however, shows a large increase in the standard errors using samples of the same size. The coefficient estimates are larger in Logit B than in Logit A, suggesting some difference in the sample composition. In both instances, however, the point estimates are small relative to the standard errors. Once I remove the fixed effects, the coefficients increase in magnitude but remain statistically indistinguishable from zero.

In the set of results for participation in clubs, the pattern for the standard errors is similar to that described for sports and lessons. The coefficient estimates are fairly consistent in both the Logit A and Logit B. They do increase once I remove the fixed effects but are not statistically significant at conventional levels.

In sum, the primary reason that the standard errors are larger in the fixed-effects logit is not the sample size reduction. Instead, there appears to be less precision in these estimates. One also finds that the omission of the adolescent-specific fixed effects biases the coefficient estimates in the logit model (Logit A) negatively.

Subsample Analyses

The analyses heretofore assume consistent relationships across all adolescents. One might expect differences in the relationship between maternal employment and after-school activities depending on the group analyzed. For example, one might expect to find differences for sons compared to daughters or by the socioeconomic status of the family (Lopoo, 2004, 2005a; Ruhm, 2005). One might also reasonably argue that single mothers may be more in need of after-school arrangements than married mothers, implying a different relationship pattern by marital status as well.

To investigate these potential differences, I ran a series of fixed-effects models splitting the sample by the child's sex, the mother's highest grade completed (arguably an exogenous measure of socioeconomic status), and the mother's martial status (which should also be highly correlated to socioeconomic status). Both the education and marital status measures were measured in the first of the two waves.[7] The results are reported in Table 3.

A couple of findings are noteworthy. First, a positive relationship between maternal employment and participation in lessons surfaces in a number of the subsample analyses for high-socioeconomic-status women. The

[7]I also ran some preliminary models by race. Because the sample sizes were so small, in many cases the models did not converge.

TABLE 3

Fixed-Effects Logit Models of Probability of After-School Activities by Subsamples, Nonlinear Maternal Work Hours Variable

	Sports	Lessons	Clubs
Sons			
Mother works less than or equal to 30 hours	0.345 (0.239) [0.082]	0.372 (0.287) [0.078]	0.099 (0.241) [0.023]
Mother works more than 30 hours	−0.005 (0.213) [−0.001]	0.481 (0.266) [0.100]	0.310 (0.227) [0.071]
N	1,858	1,566	1,712
Daughters			
Mother works less than or equal to 30 hours	0.224 (0.256) [0.053]	0.269 (0.268) [0.056]	0.125 (0.236) [0.029]
Mother works more than 30 hours	0.363 (0.237) [0.086]	0.243 (0.240) [0.051]	−0.160 (0.234) [−0.037]
N	1,606	1,660	1,872
Mother Low Education (<HS)			
Mother works less than or equal to 30 hours	0.079 (0.389) [0.019]	−0.929 (0.576) [−0.194]	0.200 (0.441) [0.046]
Mother works more than 30 hours	0.103 (0.352) [0.024]	0.044 (0.488) [0.009]	0.199 (0.402) [0.046]
N	542	408	426
Mother High Education (≥ HS)			
Mother works less than or equal to 30 hours	0.270 (0.202) [0.064]	0.467* (0.223) [0.098]	0.119 (0.202) [0.027]
Mother works more than 30 hours	0.097 (0.197) [0.023]	0.395 (0.208) [0.082]	0.035 (0.189) [0.008]
N	2,922	2,818	3,158

TABLE 3—continued

Mother Unmarried			
	Sports	Lessons	Clubs
Mother works less than or equal to 30 hours	1.142**	−0.108	−0.401
	(0.381)	(0.483)	(0.403)
	[0.271]	[−0.023]	[−0.092]
Mother works more than 30 hours	0.833**	−0.230	0.347
	(0.312)	(0.413)	(0.339)
	[0.198]	[−0.048]	[0.080]
N	910	750	856
Mother Married			
	Sports	Lessons	Clubs
Mother works less than or equal to 30 hours	−0.043	0.399	0.223
	(0.200)	(0.233)	(0.207)
	[−0.010]	[0.083]	[0.051]
Mother works more than 30 hours	−0.133	0.523*	−0.030
	(0.194)	(0.217)	(0.203)
	[−0.032]	[0.109]	[−0.007]
N	2,554	2,476	2,728

NOTES: **$p<0.01$; *$p<0.05$; robust standard errors reported in parentheses; standard errors corrected for intra-family correlation; marginal effects for maternal employment coefficients reported in brackets; models include controls for the child's age and age-squared, as well as the mother's age, indicators for mother married and mother never married, the mother's education, and the number of adults and children in the household.

relationship is statistically significant for mothers with a high school education or more who work between one and 30 hours. The coefficient is also positive and marginally significant for mothers who work more than 30 hours ($p = 0.058$). Married mothers, who tend to have higher family incomes, who work more than 30 hours have children who are more likely to participate in lessons than are the children of married mothers who do not work.

The other interesting finding is that among unmarried mothers, maternal employment is positively and significantly associated with sports participation. Compared to the children of mothers who are not working, the marginal effect of maternal employment ranges between 20 and 27 percentage points.

Discussion/Conclusion

Over the last 50 years, mothers of adolescent children have become more and more likely to enter the labor force. In turn, researchers and policymakers have asked if maternal employment has any consequences for their children. A na-

scent literature on the consequences of maternal employment for adolescents has shown different effects depending on the outcome, the methods, and the data used. Insights into these relationships are few since the empirical literature that investigates the mechanisms that underlie these relationships is particularly sparse. One finding, however, that is quite consistent in the literature suggests that when mothers go to work, especially full time, their adolescent children are more likely to spend time at home without adult supervision, that is, they are more likely to be "latchkey kids." Since working mothers are often in search of after-school care and would probably prefer not to leave their children unattended, I hypothesized that the adolescent children of working mothers may be more likely to participate in a variety of after-school activities, both as a form of enrichment and as a form of after-school care.

Results from a logit model show that maternal employment is positively related to sports participation. Maternal employment was not related, at least not in a statistically discernable way in the SIPP, to participation in lessons or clubs. Once I remove the potential bias from time-invariant unobserved factors using a fixed-effects logit model, however, the coefficient estimate for the relationship between maternal employment and sports participation is no longer statistically significant, and it remains insignificant for participation in lessons and participation in clubs.

Over time, many social scientists have become aware of the potential bias caused by omitted variables that are correlated to the variable of interest as well as the outcome, including models from population research (Moffitt, 2005). This study adds to the growing body of literature (see, e.g., Waldfogel, Han, and Brooks-Gunn, 2002) that illustrates that maternal employment is nonrandom, and that one must account for many of the time-invariant personal attributes, often unobserved in survey data, for both mothers and their adolescent children when investigating maternal employment and adolescent outcomes.

In supplemental analyses investigating differential effects of maternal employment by the adolescent's sex, socioeconomic status, and mother's marital status, I find no relationship between maternal employment and participation in clubs. I do, however, find some evidence that the relationship between maternal employment and participation in lessons surfaces for high-socioeconomic-status mothers (measured both as the mother having at least a high school education and being married). I also find evidence of a positive relationship between maternal employment and sports participation for single mothers.

The SIPP has many favorable characteristics, including the large sample size and comprehensive measure of maternal work hours over time; however, these data were less than ideal for this analysis for a few reasons. Given that the after-school outcomes available in the SIPP are categorical, it is difficult to know the specific activities that are driving the results. Understanding that it is a dance class with a teacher-to-pupil ratio of five to one that is the source of the result rather than an art class with considerable peer (or slightly older children) supervision might offer insights into the importance of adult supervision when parents choose after-school activities. Further, one might expect parents to

bundle activities to create after-school care. In other words, parents might use sports practice for two days, band practice for two days, and extended care for the fifth day. These data do not lend themselves to addressing this issue. More detailed information, such as time diaries, about after-school activities, including extended daycare, might help us understand the role after-school activities play in the lives of adolescents and their working mothers. Finally, the fixed-effects logit models use within-person variation to identify the maternal employment coefficient. If the people with variance in their outcomes over the two waves are different from the people who did not change over the period, then these results are not generalizable. Data sets that include the same outcomes over a longer period of time or more frequently during that period of time, or that measure the *time* spent in these activities—outcomes that would likely have more variation—might produce different results.

Another limitation of this study is the potential for reverse causality, that is, it may be the case that mothers increase their hours to pay for the after-school activities of their children. To test this hypothesis, I interacted age with maternal work hours. Presumably, after-school activities for adolescents get more expensive as children age and the activities become more labor and time intensive. For instance, as children age, the jazz classes or soccer practices that started as an activity once a week may increase to two or three times a week, sometimes involving travel. If this hypothesis is correct, I expect to see maternal work hours having a stronger effect as children age. Although this test cannot rule out this explanation, results from these models (results available on request) do not support it. The interactions were trivial in size and statistically insignificant.

This article is a first step toward understanding a relatively unexplored topic—adolescent after-school activities. I find that maternal employment is related to after-school activities, particularly participation in lessons such as music, dance, language, computers, and religion, for high-socioeconomic-status families and is positively related to sports for low-socioeconomic-status families. If lessons and/or sports are beneficial to children, then this serves as a potential mechanism that would produce positive effects of maternal employment on adolescent outcomes. Of course, this is an initial step and much more research into this topic is necessary before drawing definitive conclusions.

REFERENCES

Aizer, Anna. 2004. "Home Alone: Supervision After School and Child Behavior." *Journal of Public Economics* 88:1835–48.

Cain, Virginia S., and Sandra L. Hofferth. 1989. "Parental Choice of Self-Care for School-Age Children." *Journal of Marriage and the Family* 51:65–77.

Casper, Lynne M., and Kristen E. Smith. 2002. "Dispelling the Myths: Self-Care, Class, and Race." *Journal of Family Issues* 23:716–27.

———. 2004. "Self-Care: Why Do Parents Leave Their Children Unsupervised?" *Demography* 41:285–301.

Chamberlain, Gary. 1980. "Analysis of Covariance with Qualitative Data." *Review of Economic Studies* 47:225–38.

Chase-Lansdale, P. Lindsay, Robert A. Moffitt, Brenda J. Lohman, Andrew J. Cherlin, Rebekah Levine Coley, Laura D. Pittman, Jennifer Roff, and Elizabeth Votruba-Drzal. 2003. "Mothers' Transitions from Welfare to Work and the Well-Being of Preschoolers and Adolescents." *Science* 299:1548–52.

Cohen, Deborah A., Thomas A. Farley, Stephanie N. Taylor, David H. Martin, and Mark A. Schuster. 2002. "When and Where Do Youths Have Sex? The Potential Role of Adult Supervision." *Pediatrics* 110:E66. Available at ⟨http://www.pediatrics.org/cgi/content/full/110/6/e66⟩.

Gennetian, Lisa A., Greg J. Duncan, Virginia W. Knox, Wanda G. Vargas, Elizabeth Clark-Kauffman, and Andrew S. London. 2002. *How Welfare and Work Policies for Parents Affect Adolescents: A Synthesis of Research*. New York: Manpower Demonstration Research Corporation.

Hamerle, Alfred, and Gerd Ronning. 1995. "Panel Analysis and Qualitative Variables." Pp. 401–51 in Gerhard Arminger, Clifford C. Clog, and Michael Sober, eds., *Handbook of Statistical Modeling for the Social and Behavioral Sciences*. New York: Plenum Press.

Haveman, Robert H., and Barbara L. Wolfe. 1994. *Succeeding Generations: On the Effects of Investments in Children*. New York: Russell Sage Foundation.

———. 1995. "The Determinants of Children's Attainments: A Review of Methods and Findings." *Journal of Economic Literature* 33:1829–78.

Hofferth, Sandra L. 1996. "Child Care in the United States Today." *Future of Children* 6:41–61.

Lopoo, Leonard M. 2004. "The Effect of Maternal Employment on Teenage Childbearing." *Journal of Population Economics* 17:681–702.

———. 2005a. "Maternal Employment and Teenage Childbearing: Evidence from the PSID." *Journal of Policy Analysis and Management* 24:23–46.

———. 2005b. "Maternal Employment and Latchkey Adolescents." *Social Service Review* 79:602–24.

Lugaila, Terry A. 2003. *A Child's Day: 2000 (Selected Indicators of Child Wellbeing)*. Current Population Reports, P70-89. Washington, DC: U.S. Census Bureau.

Mayer, Susan E. 1997. *What Money Can't Buy: Family Income and Children's Life Chances*. Cambridge, MA: Harvard University Press.

Moffitt, Robert. 2005. "Remarks on the Analysis of Causal Relationships in Population Research." *Demography* 42:91–108.

Morris, Pamela A., Althea C. Huston, Greg J. Duncan, Danielle A. Crosby, and Johannes M. Boss. 2001. *How Welfare and Work Policies Affect Children: A Synthesis of Research*. The Next Generation Project, Report. New York: Manpower Demonstration Research Corporation.

Richardson, Jean L., Barbara Radziszewska, Clyde W. Dent, and Brian R. Flay. 1993. "Relationship Between After-School Care of Adolescents and Substance Use, Risk Taking, Depressed Mood, and Academic Achievement." *Pediatrics* 92:32–38.

Rodman, Hyman, and David J. Pratto. 1987. "Child's Age and Mother's Employment in Relation to Greater Use of Self-Care Arrangements for Children." *Journal of Marriage and the Family* 49:573–78.

Ruhm, Christopher J. 2004. "Parental Employment and Child Cognitive Development." *Journal of Human Resources* 39:155–92.

———. 2005. *Maternal Employment and Adolescent Development*. NBER Working Paper 10691. Cambridge, MA: NBER.

Smith, Kristin. 2002. *Who's Minding the Kids? Child Care Arrangements: Spring 1997*. Current Population Reports, P70-86. Washington, DC: U.S. Census Bureau.

Solon, Gary. 1992. "Intergenerational Income Mobility in the United States." *American Economic Review* 82:393–408.

U.S. Bureau of the Census. 2003a. *Detailed Table D11: Extracurricular Activities of School Aged Children-Characteristics of Children and Parents: 1998*. Available at ⟨http://www.census.gov/population/socdemo/well-being/p70-89/98tabD11.pdf⟩.

——— 2003b. *Detailed Table D11: Extracurricular Activities of School Aged Children-Characteristics of Children and Parents: 2000*. Available at ⟨http://www.census.gov/population/socdemo/well-being/p70-89/00tabD11.pdf⟩.

U.S. House of Representatives, Committee on Ways and Means. 2004. *2004 Green Book: Background Material and Data on Programs Within the Jurisdiction of the Committee on Ways and Means*. Committee Report WMCP: 108-6. Washington, DC: Government Printing Office. Available at ⟨http://waysand means.house.gov/Documents.asp?section=813⟩.

Vandivere, Sharon, Kathryn Tout, Martha Zaslow, Julia Calkins, and Jeffrey Capizzano. 2003. *Unsupervised Time: Family and Child Factors Associated with Self-Care*. Assessing the New Federalism Occasional Paper 71. Washington, DC: Urban Institute.

Waldfogel, Jane, Wen-Jui Han, and Jeanne Brooks-Gunn. 2002. "The Effects of Early Maternal Employment on Child Cognitive Development." *Demography* 39:369–92.