

## **Mother's Work Participation and Children's Cognitive Development in the Philippines**

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### Introduction

The rise in number of women entering the labor force poses challenges in both developed and developing countries. One of these challenges concerns the possible attenuation of childcare and impaired development of young children's human capital due to the conflict of interest between the employed mother's productive and domestic roles. Numerous studies have been devoted to pondering this issue. At stake with the growth in maternal employment is the possible deleterious effect of mother's work on a host of developmental outcomes, especially among young children.

Together with the bulk of studies examining the relationship between mother's work and various child outcomes, several investigations have been done on the impact of maternal labor force participation on children's cognitive development in the 1990s and early in this century. The literature on this topic yields varied results, the majority reporting a negative effect (Vandell and Corasaniti, 1990; Belsky and Eggebeen, 1991; James-Burdumy, 1999; Neidell, 2000; Waldfogel, Wenjui and Brooks-Gunn, 2002; Ruhm, 2000, 2004) while others reporting a positive effect (Vandell and Ramanan, 1992; Muller, 1995) of mother's work. Other findings also suggest that maternal employment has no significant effect on the cognitive development of children (Leibowitz, 1977; Desai et al., 1989; Blau and Grossberg, 1992; Parcel and Menaghan, 1994 ). Most of these studies, however, are in developed countries where most women are typically employed in the formal sector.

Studying the effect of mother's work on child outcomes in the developing countries is also important in light of the fact that several researchers have already found that the fertility and work experiences of women in these countries are more varied, if not contradictory, compared to that of Western women (Safilios-Rothschild, 1977; Ware, 1977; Hull, 1977; Standing, 1978; Costello and Palabrica-Costello, 1984; United Nations, 1985; Tienfenthaler, 1997:378). In the Philippines, a number of studies have pointed out the benefits of maternal employment, particularly in augmenting household amenities and financial resources (e.g., King and Evenson, 1983; Echavez, 1996; Borja et al., 1997) and in improving the quality of women's diets (Bisgrove and Popkin, 1996). If these benefits can carry over to their children, then we can expect that maternal employment may be beneficial to children's development and to other aspects of their well-being. In interpreting such differences it is also important to consider the quality of childcare substitutes. Few studies, however, have directly assessed the influence of mother's employment on child development, particularly children's psychosocial development in the developing country setting. Given the importance of early childhood development for the educational attainment and productivity of children in their adult years (see, e.g., Maluccio et al., forthcoming; Hoddinott et al., 2008), studies such as this are all the more necessary for developing countries.

This study therefore aims to contribute to knowledge regarding the association between mother's employment and childhood development in the Philippines. It focuses

on the effect of mother's work participation in the last four years on the cognitive development of children 5 to 9 years of age as measured by their score on a nonverbal intelligence test. It explores this relationship with control for possible confounders relating to children's health and mothers' human capital and household assets.

## Data and Methods

The study uses data from the Longitudinal Evaluation Study of the Philippine Early Childhood Development (ECD) Project commissioned by the Philippine Department of Social Welfare and Development to the University of San Carlos, Office of Population Studies Foundation (USC-OPS) in Cebu City, Philippines. The ECD evaluation study collected information on over 5,000 mothers and 7,000 children 0-4 years old in 2001 and followed up on these mothers and children in 2002, 2003, and 2005. By 2005, approximately 88% of the original sample remained in the study. Attrition is attributed largely to outmigration from the sample area. The study site consists of 14 provinces in three regions of central Philippines.

The analysis sample includes of about 5,200 children aged 5-9 years old who were followed in 2005 and administered a 100-item, non-verbal intelligence test developed and standardized in the Philippines (Guthrie, Tayag and Jacobs, 1977). Only those children living with their mothers during the four survey rounds, and with complete relevant information for this study are included in the analysis.

Children's cognitive development, the outcome of interest in this study, is measured by an age-graded score obtained from a nonverbal intelligence test which was standardized on 1,200 Filipino school children. The test was meant to be culturally sensitive, specifically to non-Western populations. It was intended to measure concept recognition and abstract thinking among children five to 14 years of age. The children were shown 100 cards with five drawings in each card and each child was to identify which of the five drawings was different from the other four. There was no time limit for responding to each item in the test. The test was shown to have high reliability and satisfactory validity.

Mother's work participation is the main explanatory variable in this study. In each survey, the mother was asked whether she was currently doing any work for pay in cash or kind, and if not, whether she had done so in the past four months. This signified whether she was economically active during the year of the survey. A simple longitudinal measure of her work participation was constructed by examining her work status across the four survey rounds. Women who did not report working during any survey were classified as "never worked" (22%) in contrast to those who reported having "worked intermittently" (during 1, 2 or 3 surveys; 58%), or "worked consistently" (during all 4 surveys; 20%).

Possible confounders controlled for in the analysis include: 1) maternal factors (age, educational attainment, number of pregnancies, mother's knowledge about correct child care practices), 2) household assets (ownership of land, TV and refrigerator), and 3) child nutrition (history of anemia and stunting, taken from hemoglobin and anthropometric measurements).

Bivariate and multivariate analyses are employed to examine the relationship between mother's work participation and children's cognitive development. OLS

regression is used to estimate crude and adjusted effects of mother's work on children's test scores.

Because in the Philippines gender differences in education and child rearing practices are quite pronounced (Medina, 1991), the analysis is stratified by gender. It is also stratified by age of child since child care demands, particularly on the mother, are largely a function of the child's age.

## Results

Initial results of the study (see OLS regression results in the appendix) indicate that mother's work history has no significant effect on the cognitive development of girls 5 to 9 years of age and boys 6 to 9 years old. Mother's work participation, however, is found to have a positive effect on the cognitive development of the youngest boys in the sample (aged 5), suggesting the greater sensitivity of young boys to the beneficial effects of mother's employment. The generally non-significant finding for the effect of mother's work on children's cognitive development may be due to socioeconomic status, which is more important than employment per se. The effect of asset measures on the cognitive development of the children in the sample, however, is not unequivocal. Among boys, household asset measures have no significant association with cognitive development among the younger ages (5 to 6) but are more likely to be positively significant for the older ages (7 to 9). Among the girls, on the other hand, the asset measures are positively associated with cognitive development at some ages but there does not appear to be a clear-cut pattern for this relationship and the direction varies by asset measure used. In regard to the ownership of a refrigerator, it is even found to have a negative association with the cognitive development of younger girls (age 5). Mother's education, another characteristic associated with socioeconomic status, is found to have a positive effect on the cognitive development of girls, especially those in ages 6 to 9, but not so with boys.

Other characteristics of the mother that appear to be relevant to the children's cognitive development are mother's knowledge, attitude, and practices regarding child care, which is found to have a positive effect among older girls (ages 7 to 9), and the mother's number of pregnancies, which is negatively associated with cognitive development particularly among younger girls (ages 5 and 6) and older boys (ages 6 to 9). The influence of mother's age does not demonstrate a discernible pattern by age of the child.

Enrollment in daycare (a public facility) and nursery/playgroup (usually private) also show significant effects on cognitive development. Nursery or playgroup attendance appears to have a positive influence among the younger children (girls aged 5 and boys aged 5 and 6) but no significant influence among the older ages. Apparently it is the recency of the playgroup/nursery experience that helps enhance children's performance in the intelligence test. Daycare attendance, on the other hand, may have both beneficial and deleterious influences on cognitive development by child's age. It manifests positive associations with cognitive development among the younger girls (age 5) just as the nursery/playgroup experience does, but a negative association on cognitive development among the older girls (ages 7 to 9). Among boys, too, while daycare attendance has no significant effect on the cognitive development of those aged 5 to 7, the association is

found to be negative for those in the oldest age group (ages 8 and 9). These results may be due to the selection of lower-IQ children in daycare attendance among the older kids.

Lastly, regression results illustrate the greater importance of nutritional status on the cognitive development of girls compared to boys. Stunting is found to negatively affect cognitive development of girls across the entire age range (5-9), while anemia exhibits a negative effect only among the younger girls (age 5). The negative influence of anemia and stunting, while significant at some ages, does not demonstrate a clear-cut pattern by age among boys.

The results presented are considered preliminary since ongoing analysis will explore alternative specifications and approaches, specifically in dealing with the confounding effects of socioeconomic status and income, as well as the issue of endogeneity that has yet to be addressed in this study.

## REFERENCES

- Belsky, J. and D. Eggebeen. 1991. "Early and Extensive Maternal Employment and Young Children's Socioemotional Development." *Journal of Marriage and the Family* 53(4):1083-1110.
- Blau, F. and A. Grossberg. 1992. "Maternal Labor Supply and Children's Cognitive Development." *Review of Economics and Statistics* 74(3): 474-481.
- Bisgrove, E.Z. and B.M. Popkin. 1996. "Does Women's Work Improve Their Nutrition: Evidence from the Urban Philippines." *Social Science and Medicine* 43(10): 1475-1488.
- Borja, J., L.S. Adair and E.Z. Bisgrove. 1997. "Effects of Childbearing on Quality of Women's Lives." In *Proceedings from the International Population Conference (Vol.2)*, International Union for the Scientific Study of Population, Liege. Pp.681-698.
- Costello, M.A. and M. Palabrica-Costello. 1984. "Female Employment, Occupational Setting and Fertility in a Philippine City." (mimeo) Research Institute for Mindanao Culture, Xavier University, Cagayan de Oro City.
- Desai, S., P.L. Chase-Lansdale, and R. Michael. 1989. "Mother or Market? Effects of Maternal Employment on Intellectual Ability of 4-Year Old Children." *Demography* 26(4): 545-561.
- Echavez, C.R. 1996. "Women and Factory Work: A Case in Cagayan de Oro City, Philippines." PhD. Thesis, Australian National University, Canberra.
- Hoddinott, John, John A. Maluccio, Jere R. Behrman, Rafael Flores and Reynaldo Martorell, 2008, "The Impact of Nutrition During Early Childhood on Income, Hours Worked, and Wages of Guatemalan Adults" *Lancet* (February).
- Hull, V.J. 1977. "Fertility, Women's Work and Economic Class: A Case Study from Southeast Asia." In Kupinsky, S. (ed.) *The Fertility of Working Women: A Synthesis of International Research*, pp.35-80. New York: Praeger Publishers.
- James-Burdumy, S. 1999. *The Effect of Maternal Labor Force Participation on Child Educational Attainment*. (mimeo) Princeton, New Jersey: Mathematica Policy Research, Inc.
- King, E. and R.E.Evenson. 1983. "Time Allocation and Home Production in Philippine Rural Households." In Buvinic, M. M.A. Lycette and W.P.McGreevey (eds.), *Women and Poverty in the Third World*, pp.35-61. Baltimore: Johns Hopkins University.
- Leibowitz, A. 1977. "Parental Inputs and Children's Achievements." *Journal of Human Resources* 12(2): 242-251.
- Maluccio, John A., John Hoddinott, Jere R. Behrman, Agnes Quisumbing, Reynaldo Martorell and Aryeh D. Stein, 2007, "The Impact of Nutrition During Early Childhood on Education among Guatemalan Adults," Philadelphia-Washington-Atlanta: University of Pennsylvania, IFPRI, Emory, processed.
- Medina, B.T.G. 1991. *The Filipino Family: A Text With Selected Readings*. Quezon City: University of the Philippines Press.
- Muller, C. 1995. "Maternal Employment, Parent Involvement, and Mathematics Achievement Among Adolescents." *Journal of Marriage and the Family*

57(1):84-100.

- Neidell, M.J. 2000. *Early Parental Time Investments in Children's Human Capital Development: Effects of Time in the First Year on Cognitive and Non-cognitive Outcomes*. (mimeo) Los Angeles, CA: University of California at Los Angeles.
- Parcel, T.L. and E.G. Menaghan. 1994. *Parents' Jobs and Children's Lives*. New York: Aldine de Gruyter.
- Ruhm, C.J. 2000. *Parental Employment and Child Cognitive Development*. National Bureau of Economic Research. Working Paper No. 7666.
- Ruhm, C.J. 2004. "Parental Employment and Child Cognitive Development." *Journal of Human Resources* 39(1): 155-192(38)
- Safilios-Rothschild, C. 1977. "The Relationship Between Women's Work and Fertility: Some Methodological and Theoretical Issues." In Kupinsky S. (ed.), *The Fertility of Working Women: A Synthesis of International Research*, pp.355-368. New York: Praeger Publishers
- Standing, G. 1978. *Labour Force Participation and Development*. International Labour Office (ILO), Geneva.
- Tienfenthaler, J. 1994. "A Multisector Model of Female Labor Force Participation: Empirical Evidence from Cebu Island, Philippines." *Economic Development and Cultural Change* 42(4): 719-742.
- United Nations. 1985. *Women's Employment and Fertility: A Comparative Analysis of World Fertility Survey Results for 38 Developing Countries*. Population Studies No.96. New York: United Nations.
- Vandell, D. and M. A. Corasaniti. 1990. "Variations in Early Child Care: Do They Predict Subsequent Social, Emotional, and Cognitive Differences?" *Early Childhood Research Quarterly* 5, no. 4:555-72.
- Vandell, D. and J. Ramanan. 1992. "Effects of Early and Recent Maternal Employment on Children From Low Income Families." *Child Development* 63, no.4:938-49.
- Waldfogel J., H. Wenjui and J. Brooks-Gunn. 2002. The Effects of Early Maternal Employment on Child Cognitive Development. *Demography* 39(2):369-392.
- Ware, H. 1977. "Women's Work and Fertility in Africa." In Kupinsky, S. (ed.) *The Fertility of Working Women: A Synthesis of International Research*, pp.1-34. New York: Praeger Publishers.

**APPENDIX**

**Table 1. Coefficients (and p-values) for the OLS regression of non-verbal intelligence score on selected mother's, household's and children's characteristics, by sex and age of child**

	Males				Females			
	Age 5	Age 6	Age 7	Age 8 & 9	Age 5	Age 6	Age 7	Ages 8 & 9
Mom worked intermittently	3.0687 (0.034)	1.4921 (0.306)	1.3519 (0.359)	0.7679 (0.546)	2.4092 (0.091)	-0.5508 (0.721)	1.8616 (0.171)	2.2552 (0.112)
Mom worked continuously	4.3644 (0.027)	1.1257 (0.534)	2.6811 (0.131)	1.3226 (0.402)	3.8213 (0.057)	0.6939 (0.734)	2.2425 (0.194)	1.5342 (0.382)
Mom completed elementary or some high school	-0.9327 (0.570)	1.2258 (0.452)	-0.5264 (0.735)	0.4683 (0.719)	2.3408 (0.145)	4.2051 (0.013)	5.0852 (0.001)	1.9050 (0.191)
Mom completed high school or higher	2.0618 (0.281)	1.9995 (0.290)	2.0965 (0.270)	2.6042 (0.090)	2.9846 (0.103)	4.1209 (0.033)	5.6921 (0.001)	4.3147 (0.012)
Mom's age	-0.1945 (0.086)	0.2923 (0.010)	0.1253 (0.226)	0.2431 (0.008)	0.2077 (0.071)	0.2511 (0.033)	0.1152 (0.245)	-0.0373 (0.713)
Mom's total pregnancies	-0.0900 (0.762)	-0.9146 (0.001)	-0.7768 (0.003)	-0.8095 (0.000)	-0.7256 (0.023)	-0.6757 (0.016)	-0.4880 (0.053)	-0.5035 (0.038)
Mom's KAP score	0.0202 (0.948)	0.6473 (0.022)	0.5417 (0.072)	0.3991 (0.102)	-0.0105 (0.971)	0.4162 (0.150)	0.7516 (0.004)	-0.5176 (0.036)
Ever attended day care	0.1809 (0.887)	0.3162 (0.818)	-0.9652 (0.447)	-9.6767 (0.000)	3.1695 (0.016)	-1.2988 (0.370)	-4.6464 (0.000)	-8.6619 (0.000)
Ever attended nursery	4.9547 (0.010)	5.9529 (0.000)	-1.8786 (0.261)	-1.0870 (0.515)	9.6327 (0.000)	2.8385 (0.084)	2.4894 (0.117)	2.1839 (0.276)
Own land	0.8780 (0.481)	1.0842 (0.361)	2.0568 (0.104)	2.6257 (0.009)	1.1170 (0.378)	3.8667 (0.003)	0.4474 (0.692)	3.5371 (0.002)
Own television	1.4063 (0.317)	2.4369 (0.069)	4.3102 (0.002)	4.3435 (0.000)	4.8199 (0.001)	0.6348 (0.660)	3.8469 (0.003)	1.9440 (0.119)
Own refrigerator	0.4311 (0.826)	-1.8016 (0.328)	3.7489 (0.047)	3.0169 (0.071)	-5.0937 (0.009)	3.9773 (0.047)	-0.8313 (0.633)	1.5413 (0.383)
Ever been anemic	0.5976 (0.729)	-4.2802 (0.002)	-0.5124 (0.689)	-0.6342 (0.560)	-3.2850 (0.039)	-1.2479 (0.368)	0.1761 (0.877)	0.3061 (0.793)
Ever been stunted	-3.6897 (0.005)	-1.2659 (0.299)	-4.2762 (0.001)	-0.2741 (0.793)	-2.6783 (0.036)	-3.9587 (0.002)	-2.4793 (0.028)	-2.5926 (0.022)
R-squared	0.0906	0.1408	0.1632	0.1712	0.1799	0.1599	0.1865	0.1583
Number of cases	593	575	604	775	527	527	585	686