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## **The Distribution of Children's Developmental Resources**

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### **Abstract**

This paper examines the distribution of children's developmental resources through children's time diaries and other selected measures from the 1997 Child Development Supplement (CDS) to the Panel Study of Income Dynamics (PSID). We examine the extent to which parental beliefs, particularly when shared, influence developmental resources, notably time and social capital, devoted to the development of young children. Our analysis relies on the idea of parents' shared beliefs about the common or family public good of child development. If both agree to a high standard child development this leads to greater shared effort to enhance child well-being. If own time devoted to childcare is enjoyed by each parent, there is a double payoff to child care time. First, there is the value to the collective good of child well-being. Second, there is the value to each partner from the level of intrinsic satisfaction from child care or what has been referred to as 'process benefits' in the theory of time allocation or 'warm glow' in the theory of privately provided public goods. Yet another public good from shared childcare is marriage capital which may facilitate agreement over allocation of resources to produce both the public good of childcare and other family and individual goods – such as each spouse's career and a balance of resources to other pursuits and goods and services.

We simplify the empirical implementation by emphasizing the production side of the equation. The development of young children is presumed to have limited substitution opportunities. Specifically, suppose the time of just one parent is far less effective than a balanced amount from each. In a parallel way, joint parental time without companion physical resources and nutrition and preschool or social capital is far less effective than a balance between family care time and the inputs to children arising from greater social capital. We provide an initial exploration of the extent to which couples use weekends as an opportunity for developmental time to children. While this may not be a method for couples to jointly and simultaneously spend time with children, since the mother may be the primary provider during the weekdays, it can provide some simultaneous parental time as well as raising the total child care time of the father. Fathers with high human capital also spend selectively more time with children in achievement-related activities, particularly on weekends. Couples who rate child development highly seek out better schools and neighborhoods with greater social capital for child well-being. As a result, these out-of family resources do not lead to a major reduction in the dispersion of early resources and in fact may be part of the pattern of wide dispersion in developmental inputs to children. Such a finding is consistent with research on Swedish families

(Hallberg and Klevmarken, 2002), which shows that out-of-home child care is not simply a substitute for within family resources to young children. As a result, the long-standing debate initiated by Coleman (1966) about whether it is schools or families which contribute to differences in resources to young children is answered as “both do.”

## **Introduction and Overview**

This paper examines the intra-family resource allocation decision of couples with differing levels of shared belief in the importance of devoting resources to the development of their young children. Concerns over the quantity and quality of time children spend with parents have been raised by policy makers and family scholars alike (Hewlett, 1991; Schor, 1991; Hochschild, 1987, 1989) as a growing number of children are now raised in dual-earner families (Casper & Bianchi, 2002). Recent time-use studies have shown that these concerns may have been overstated for the U.S. (Jacobs & Gerson, 2001; Robinson and Godbey, 1999) and for other countries as well (Klevmarken and Stafford, 1999). When the reduction in number of children per family over time is taken into account, mother's time on per-child basis has not reduced but slightly increased (Bianchi, 2000; Bryant and Zick, 1996). Moreover, on average, fathers appear to have now spent more time with children on per child basis (Bianchi, 2000; Sandberg and Hofferth, 2001; Pleck, 1997; Yeung, Sandberg, Davis-Kean and Hofferth, 2001).

While the process of intra-family allocation of resources to children and the average level of resources may have changed over time, the dispersion about that average is of interest and more difficult to measure, since inputs from multiple domains are involved. Family resources to children are likely to be more unequal nowadays as studies show an increasing inequality of family income and wealth in the last several decades (e.g. Danziger and Gottschalk, 1994; McLanahan and Caper, 1995; Wolff, 2001). Our data allow the measure of dispersion in a set of resources at a single time point (1997) in a given country (U.S.), and future work will be needed to re-measure the dispersion to observe any change in dispersion.

With similar and strong preferences for child development, parental care of children is expected to be the basis for a family-specific public good which will increase marital satisfaction and enhance the stability of the marriage through time (Hill, 1988). In addition, if child development is augmented by other inputs such as material resources in the home and educational services of out-of-home care providers (Klevmarken and Stafford, 1999), these need to be included to attain a comprehensive picture of child inputs. These other material resources are difficult to assign to specific children and are given much less emphasis included in this paper since our focus is on time of each parent individually and jointly, and on social capital. Essentially, parental resources and preferences give rise to a demand for child development

levels of their children and greater levels of all inputs are used to create a better developmental outcome.

On the ‘production’ or ‘supply’ side, the assumption is that there are substantial limits to parents’ ability to substitute across different modes in producing higher levels of overall development of young children. As a result, when couples agree on achieving a high level of child development they will likely increase all inputs which directly benefit the child – time of each parent individually, time of the parents jointly and simultaneously caring for the child, material resources within the home, choice of higher levels of out of home schooling (via private providers or better public schools via ‘purchase’ of better community schools through the real estate market).

We do not directly examine two types of trade-offs parents make in considering time allocation: (1) tradeoffs between investing time in children and in parents themselves (child/parent trade-offs), and (2) that between investing in the market career of the father and that of the mother (parent/parent trade-offs) (Mincer and Polachek, 1974). These intra-family allocation issues are very complex to model and we instead choose a more production based approach, allowing for the demand side to be shaped by shared preferences and resource indicators, such as sharing in the disciplining of children, agreeing about how the children are to be raised, and the importance of an active father figure.

## **I. Theoretical Perspectives on Developmental Resources**

### **A. The Production Side**

In the economics of the family (Becker 1974, 1981; Willis, 1973) the distinction has been made between the number of children a couple may want, and the skills, knowledge, and socialization, called quality or developmental level, which parents wish their children to attain. Using this distinction provides an explanation of why rich parents do not necessarily want to have fewer children than do less well-to-do parents. They rather prefer children with more "quality". Thus, in this model both the quantity and the quality of children contribute to the satisfaction of the parents. However, if quality is more income elastic than quantity, the interaction between quality and quantity can lead to an apparent negative income elasticity of demand for quantity. Utility is also a function of non-child related consumption. Parents are assumed to make a choice between the number of children and the resources they want to allocate to the children and other non-child related consumption so as to maximize their joint utility subject to an inter-temporal budget constraint and a time constraint.

Here we consider the process by which child development occurs in a highly stylized ‘production’ setting. The main idea is that parent’s own time, on the one hand, and externally purchased goods and services, on the other, are, beyond some limited range, more likely to be complementary rather than substitutable. In addition, the time of both parents may be complementary – so two hours of one parent’s time may not be as effective as one hour of time from each. These factors lead child development, especially of young children, to be time intensive and in two-parent households more effectively produced by a balanced time input from each parent rather than one parent being the primary and nearly sole caregiver. In addition, the developmental outcomes of the child are a family public good, which both parents may value in differing degrees. We assume that those who care most about this family public good are most likely to match up in marriage and that such marriages will tend to be more stable, with single-parent arrangements often reflecting lack of agreement of the biological parents about staying together to provide developmental resources.

If parents’ efforts to bring up their children is solely motivated by the joy and satisfaction they obtain by doing it independent of the result, then what we would normally call time inputs to investments in children may be only consumption **or** produce **both** consumption and investment as outcomes. That parents derive satisfaction from childcare per se (as distinct from the added routine housework) gives rise to the application of impurely altruistic or ‘warm-glow’ aspects (Andreoni, 1990) to the resources provided by each partner caring for children.

A major research challenge is to measure the relevant inputs and their role in producing cognitive and social skills of young children. In this paper we look primarily at parental time in developmental activities,  $h_c$ , activities described and coded in the time diaries as play and companionship activities, achievement-related, and ones thought to enhance a child’s social skills and physical development. The family has a utility function

$$(1) \quad U = U(N, K_1, Z)$$

where  $N$  is the number of children,  $K_1$  is child quality or home input received by each child. (Here we ignore inter-child differences and the detail of which parent’s time.) All other goods are represented as  $Z$ . To simplify we assume  $K_1$  and  $Z$  are produced according to the following linearly homogeneous ‘household’ production functions

$$(2) \quad C = C(h_c, M_c)$$

$$(3) \quad Z = Z(h_z, M_z)$$

where  $C = NQ$  and  $h_i$  and  $M_i$  ( $i = C, Z$ ) are, respectively, vectors of time and goods allocated to children and other pursuits. In the framework one can modify the process by adding childcare time as an argument in utility in (1). Here we develop expressions for the parents' combined allocation of time to childcare ignoring such process benefits. Specifically, it can be shown that the compensated wage elasticity of childcare time can be expressed as:

$$(4) \quad \left. \frac{\partial_{hc}}{\partial_w} \cdot \frac{w}{h_c} \right|_F \equiv \varepsilon = -(1 - \alpha_c)\gamma_c + (1 - k)\sigma(\alpha_z - \alpha_c)$$

where  $\alpha_c = wh_c/\Pi_c C$  is the time intensity parameter for the production of  $C = NQ$  ( $\alpha_z$  is analogously defined for the production of  $Z$ );  $\gamma_c$  is the elasticity of substitution between  $h_c$  and  $M_c$  in the production of  $C$ ,  $k$  is the share of the full budget ( $F$ ) going to child care and  $\sigma$  is elasticity of substitution in consumption between  $C$  and  $Z$ . The algebraic sign of the second term on the right hand side of (4) depends on the difference in time intensity parameters in the production of  $C$  and  $Z$ . It seems very plausible that, particularly in the preschool years, the time intensity of childcare exceeds that of other home activities, and  $\alpha_c > \alpha_z$ . An increase in market wage of the parent raises the marginal cost of both  $C$  and  $Z$ , but raises it relatively more for the more time intensive commodity. For  $\sigma > 0$  this will lead to a substitution away from  $C$ .

The explanation for greater time in child care for more educated parents rests on the underlying income elasticity for  $C$ . Further, as distinct from other household activities, the production of child care probably exhibits a very low elasticity of substitution between goods and time ( $\gamma_c$ ) and accounts for a large fraction of the family's full budget. For these reasons childcare time can be greater for those with higher wage potential despite the higher time cost and can be much greater per child. In addition, if educated, high wage parents match up in marriage to achieve mutual warm glow benefits from child care, there may be, across families, a resulting high level of dispersion in resources to early development of young children.

## **B. Joint Time Investments in Two-Parent Families**

Time investments at home are predominantly, but not exclusively, by parents, who decrease their market and leisure time to care for their children. A few studies have pointed out that in addition to income forgone while a parent is at home taking care of children, there is a career shadow price of the forgone opportunity to invest in own human capital and build up future earnings. Possibly social capital, defined as resources that “inhere in family relations and in community organization and that are useful for the cognitive or social development of a child or young person” (Coleman, 1990: 300), notably including values and preferences of children, is greater for more affluent families – and social capital may not involve much added short-run time cost. As in the warm glow public goods approach, time inputs to children may be valued per se and may be a shared time use that defines a marriage. We wish to distinguish between different kinds of time inputs. Child development time is distinct from core housework, which is normally greater with young children in the home. One is the direct care of a child, an activity in which the child (children) is the primary target, such as feeding a child, dressing a child, reading to a child or helping out with homework which is distinct from added time doing laundry. Also, parents and school-based caregivers may provide unequal amounts of time to siblings. One apparent motivation is a type of intra-school or intra-family equity (Gustafsson and Stafford, 1997).

To summarize, we assume that much of the simple one-parent model above applies, but that, in addition, there is a sorting and matching process leading to parental pairs of individuals who are similar in their rating of the importance of child development. Moreover childcare may be a source of match-specific enjoyment that solidifies the marriage. In this vein, when such a matching is not the case, we might have either a less stable relationship for the parents and a single-parent outcome, or a situation where one parent has the primary responsibility for child development (possibly motivated by warm-glow feelings) and the other is either a free rider or compensates the partner in some other domains. To simplify, for dual-parent situations, there are four cases – both parents care a great deal about their own time to child development, one does and the other doesn't, and both rate child development as less central. In addition, there is some need to bring in resource constraints and full income elasticities to allow for different resource levels. The role of such full or potential income is difficult empirically since a parent may reduce



their earnings and longer run earning potential to aid in their child's early investments (Gustafsson and Stafford, 2000). As a practical matter, we rely on indicators of resources such as education, but these may also reflect preferences for child development.

Several perspectives are offered to explain the process of domestic labor time allocation by sociologists. The first of these is based on the social exchange theory, which, as in some economic models, has the basic idea that the partner who has more resources (usually measured by labor earnings) exchanges resources with services of domestic labor. This perspective assumes that domestic labor is viewed as undesirable by both men and women and that they are motivated to buy out their share of it with resources they own (Goldscheider & Waite, 1991; Brines, 1993). Parents' command over resources determines the power relation between spouses and affects the household division of labor (Farkas, 1976; Coverman, 1985; Kamo, 1988). As women's financial contribution to the family increases, their bargaining power for less domestic responsibilities increases and men's share of domestic tasks increases. Empirical results show that wife's wages tend to increase her relative power in the relationship, thus inducing a more equal division of domestic labor and child-care responsibilities between the partners (Goldscheider & Waite, 1991). Since men usually contribute substantially more to total family income than women, women tend to perform more domestic labor than men, but child care needs to be distinguished from routine housework, since a rich family can have housework hired out to be done by a 'third party' - the  $Z$  good in equation (3) above as distinct from  $h_c$  in equation (2). But much of this discussion centers on what is termed core housework (Bianchi, Milkie, Sayer and Robinson, 2002). Childcare is seen as an intrinsically valuable activity (Hallberg and Klevmarken, 2002) and gender roles shaped by opportunity cost of the partners may be much less important. Instead partners may bargain (Lundberg and Pollack, 1997) for the opportunity to care for the children - as distinct from the child-induced, routine housework, such as laundry and cleaning, which they bargain to avoid.

The second perspective from sociology, developed to explain why the relative earnings of the partners alone cannot explain men and women's division of labor in the household is based on gender ideology (West and Zimmerman, 1987; South and Spitze, 1994; Robinson and Milkie, 1998). This perspective argues that the performance of housework or childcare symbolizes the gender relations within a household. That is, women's performance of housework and childcare is not simply an exchange for men's financial contribution but a display of their femininity.

Similarly, men express their “masculinity” by their lack of participation in domestic tasks. In West and Zimmerman’s term, men and women are “doing gender” through their allocation of time to domestic and labor market work. Here, too, one needs to distinguish childcare from routine housework or routine housework arising from young children in the family.

An egalitarian gender-role orientation of the partners affects the levels and forms of child investment by the mother and the father. Parents with a more egalitarian relationship tend to have a more equal level of involvement in children’s lives than those who hold a more traditional gender ideology. Parents’ educational attainment is often used as a proxy for their gender role orientation. One study, based on time diary data from the U.S. in the mid-1970’s appears to support the division of labor hypothesis quite strongly. Lower own wage and higher spousal wage both predict greater own time in routine housework. Yet when the variable, ‘is spouse male’ is added to the equation, the wage effects become insignificant (Hill and Juster, 1985), suggesting that housework roles, at least then, were greatly shaped by gender. In our prior work based on U. S. data (CDS), we found that highly educated fathers had greater involvement in direct childcare, particularly on weekends (Yeung and Stafford, 2002). Whether the gender ideology or warm-glow public good approach is a better interpretation is less obvious.

Base on theoretical perspectives discussed above, we examine how the level of parental investment in children’s development, in the form of time, social capital, and other materials and resources is affected by their shared beliefs about family public good of child development and their socioeconomic characteristics. In the next section, we discuss the data source, measures, and results of our analyses.

### **III. Time Allocation Patterns**

#### **A. The Measures**

We use data from the Panel Study of Income Dynamics (PSID), which has collected annual data on the socioeconomic characteristics of 5,000 nationally representative families since 1968. In 1997, the PSID added to the study a Child Development Supplement (CDS), which contains information about child development for a national sample of approximately 3,500 children aged 0-12 in 1997. This sample enables the comparison of children in a full range of socioeconomic circumstances. For detailed information about the study see study web site <http://www.isr.umich.edu/src/child-development/home.html>. Unique in this data set is the

children's time diaries collected in the spring and the fall of 1997. Each family was asked to complete a diary for a pre-assigned random weekday and a weekend day. The diary was designed to gather information on a child's activities over the 24 hours of the assigned day, with the day beginning and ending at 12:00 midnight. Respondents were asked to complete a time grid for activities in which the target child participated during the assigned days.

The primary caregiver of the target child, in most cases the mother, was the preferred respondent in cooperation with the target child, when possible. For the sample used in this paper, 60% of the diaries were completed by the child's mother alone, 12% were completed by the mother and the target child, 6% were completed by the child alone (all of these children were 9 years or older), 3% were completed by the mother and father together, 2% by the child's father alone, less than one percent were completed by mother, father, and the child together, only 5 diaries were completed by the father and the child together, and 12% were completed by someone else. Information on who completed the instrument is missing for approximately 4% of the diaries. It is important to bear in mind when interpreting the results that data used in this paper were reported mostly by mothers<sup>1</sup>.

For each activity reported, respondents were asked to provide information about (1) the time the activity began and ended, (2) if the child was watching TV or a video, and, if so, what the program/video the child was watching, (3) where the child was during that activity, (4) who was doing that activity directly with the child (active engagement), (5) who else was there but not directly involved in that activity (passive engagement or accessible time), and (6) what else was the child doing along with the primary activity – the secondary activity. This paper only analyzes children's primary activities but utilizes the measurement concepts of active and accessible time of parents in conjunction with a selection of time uses seen as relevant for child development. In order to obtain the most complete information possible for the target day, field interviewers contacted respondents to review the diaries. When there were gaps in the times given or when the diaries were incorrectly completed, the interviewers probed for additional information from the respondents.

Data from child-based diaries can also track this spousal allocation if the presence of parents and others is an element in each diary episode. In this way it is possible to use the data to study

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<sup>1</sup> We conducted robustness tests excluding diaries completed by the fathers alone or by fathers and the target child. Results prove to be robust in most cases. When discrepancies were found, differences are small.

care of each child by each parent individually and care by the parents jointly. The joint time of the parents may be a very good indicator of the role of childcare as a shared activity promoting benefits from the process of time allocation itself (Hallberg and Klevmarken, 2002; Juster, 1985) rather than solely the anticipated developmental outcome.

The validity of the time-diary data has been assessed extensively in previous literature. This method is generally seen to be preferable to other methods of measuring time use in large samples. Direct observation is impractical because of its cost, while simple recall methods of assessing daily time use may be less accurate (Juster, 1985). In addition, time diaries have been found to be as accurate, and possibly more accurate, in assessing actual time use than more expensive methods with presumably high validity. The latter include “beeper” studies in which respondents are asked to record their activities at random times during the day as signaled by an electronic beeper (Robinson, 1985). More traditional “stylized” questions that ask directly of the frequency and duration of time spent in various activities are affected by the pre-defined categorization of activities and possibly by systematic over- or under- estimation on the part of respondents of their actual time use in those activities (Robinson, 1985; Stafford and Duncan, 1985).

One rough test of data quality frequently used is the number and variety of distinct primary activities reported, with higher frequencies on both counts presumed to indicate better data quality (Juster, 1985). On average, children in our sample engaged in about 24 discrete activities over the course of the day, representing, on average, about 13 different types of activities. These are comparable to an earlier time use study of children in the early 1980s that used the same methodology (Timmer et al., 1985).

## **B. Time Children Spend with Bio-Parents Over the Week**

Our analysis based on PSID children’s time diaries shows that the total parental time input was significantly higher in intact families than in other types of families. Table 1 shows how much time children spent interacting directly with their biological parents by four family types: (1) both biological parents in the household, (2) only the biological mother present, with or without a stepfather, (3) only the biological father present, with or without a stepmother, and (4) other family types (neither biological parent lives with the child). Children who lived in intact,

two-parent families spent 2 hours and 15 minutes on a typical weekday, and 4 hours and 42 minutes on a weekend day directly interacting with either of their biological parents. The amount of this time decreased dramatically for those children who lived only with one or neither of their biological parents. For children who were living with both biological parents, a substantial portion of these hours were spent with both parents together--51 minutes on a weekday and 2 hours and 46 minutes on a weekend day. The shared time with both parents was almost nonexistent for children in other family types.

The amount of time a child spent with the mother alone is not significantly different between those in intact families and those in mother-only families. Over a week, children who lived only with their biological mother spent more than 10 hours less with their biological parents than those who lived with both their biological parents. These results suggest a wide variation in resources that children in different family types received from their parents in the form of time. For the remaining analysis in this paper, we will restrict our sample to those children who were living with both biological or adoptive parents at the time of the interview to minimize the complicated interaction effects between family structure and intra-family time use allocation.

### **C. Measuring Children's Time Use and Activities with Parents**

Table 2 presents the overall levels of children's time allocation to various activities by mother's socio-economic status for children who are in intact families. Noticeable differences between children of working mothers and those of nonworking mothers are that children of working mothers, regardless of mother's educational attainment (the SES indicator), spent more time in school (defined as a formal, out-of-home arrangement) and less time sleeping and playing than did children of nonworking mothers. There is significant variation in how children spent their time by mother's education among those with a working mother. Children with a more educated (college, defined the high SES indicator) working mother generally spent more time studying, reading, and using computers and about 20 minutes less watching TV than did those with a working mother who did not have any college education on both weekdays and weekends. Of the four subgroups, children of working mothers who had no college education spent the most time watching TV on weekends (138 minutes). On the other hand, children with a nonworking mother who has college degree or higher spent the most time reading, working on computers, or having a conversation with parents on both weekdays and on weekends. These

results suggest a positive association between mother's human capital and the level of time children spent in cognitively stimulating activities, regardless of mother's employment status.

We next examine the amount of time a parent interacts directly with a child and the amount of time a parent is available to the child but not directly engaged with the child (referred to as "engagement time" and "accessible time" respectively in Lamb et. al., 1985) across a wide range of activities. The total time a parent is engaged with or accessible to a child was ascertained through summing up all the time segments of activities of the sort highlighted in Table 2 where a parent was reported to be doing the activity with a child or was accessible to the child but not doing the activity with him or her. Note that the data collected in these children's time diaries reflect the amount of time each child spent with his/her mother or father in various activities, rather than the total time a parent spent with all his or her children. In addition to the quantity of time, we capture the context of time use by categorizing time allocation in different types of activities that children are involved in with their parents. We define parental involvement in children's intellectual, physical, and social development ("developmental time") as time spent in caregiving, play/companionship, achievement-related, and social activities, with parents' involvement in caregiving activities generally decreases and that in achievement-related and social activities increases as a child ages. We distinguish this type of developmental time from the core housework. Major categories of such parental involvement include the following activities.

- (1) Caregiving activities, which include care the child received such as bathing, changing, and grooming, as well as eating meals together both at home and away from home
- (2) Play and companionship activities, which include both active and passive play and other types of leisure events
- (3) Achievement-related activities, which include time spent studying, doing homework, reading, and in other educational lesson
- (4) Social activities, which include visiting, household conversations, religious activities, and participation in other social events

The sample for our analysis in the following section includes 943 children aged 0-12 who lived with both their biological or adoptive parents in 1997 and whose families have returned a

questionnaire that contains parental attitudes regarding parenting experience. Table 3 presents the characteristics for the sample.

#### **D. Analysis of Dual Commitments to Work and Children**

For those combined developmentally relevant time uses of young children, (1) – (4), we then measure how much of that time is actively engaged with the father or mother or both parents simultaneously. Parents' commitments to child development is measured by parents' self reports to a question that assesses the extent to which he or she agrees to the statement that "Being a father/mother and raising children is one of the most fulfilling experiences a man/woman can have". The scale ranges from 1 to 4, indicating low to strong parenting value. Of all mothers, 49% reported that they "strongly agree", 46% "agree", and 4% either "disagree" or "strongly disagree" with the statement. The corresponding distribution for fathers' reports is 55%, 43%, and 2%. Those who responded "strongly agree" are coded as having a "high" value on childrearing. Four categories of couples are formed based on both parents' attitudes – both have high value of child development (consisting of 32 percent of the sample), one parent has high value while the other does not (18% with the mother having a high value and 21% with the father having a high value), and neither parent has a high parenting value (29%).

Table 4 presents the level of developmental time a child spent with parents by parents' attitudes about child development. Consistent with a matching view of marriage with respect to child care beliefs, about three-fifths of the observations are ones where the parent are scored either both high or both low with two-fifths not 'matched'. Furthermore, when we examine the relationship between parents' developmental time input, we found highly significant positive correlations, at .79 level for engaged time and .58 for the broader definition that includes time accessible to, but not directly engaged with, a child. This implies that child care is not just a task to be done but is the basis for a marriage match that sorts couples by interest in and enjoyment from child care.

When both parents rate child development highly there is more engaged developmental time individually and jointly with the child in comparison to the 'Neither High' group. Over a week's time, a child of parents who both have a high value spent about 52 more minutes engaging jointly with both parents, two hours more with the father, and two and a half hours more with the mother than a child of parents who both do not have a high value in child development.

Expanding the definition of developmental time to include accessible time or what may be thought of as ‘on call’ time leads to a less well-defined though generally consistent pattern. This may be thought to reflect the actual time engaged as a better measure of quality time from the perspective of child development.

Using these measures of engaged and accessible time, a series of models was estimated. A limited dependent variable method is appropriate since many children spend no time in a given category of activity, and Tobit estimation corrects for this censoring at zero minutes. For all our analyses, we treat weekend days and weekdays jointly combined so as to have decent weeklong estimates of time allocation. Data are weighted to adjust for selection probability and the non-response rate. Results of these Tobit estimates are presented in Table 5.

Consistent with previous literature, the PSID data show a pattern of significant decline in parental time involvement as children become older. New in our data is that joint time with both parents do not significantly decline with a child’s age but rather increase when we use the broader definition of time input which includes the time both parents are accessible to a child. Of interest in the relationship between parents’ characteristics and their time input is that mother’s education is related to *less* child-related time. Possibly qualitative aspects of childcare or very specific types of developmental time are positively related to mother’s education, but the broader measures used here are not. In other work, we have seen that both mother’s and father’s weekday and weekend time in a set of narrowly defined achievement-related activities is positively related to their educational attainment (Yeung and Stafford, 2002). A main interest, whether couples where both reported to have a high value in child development spend more time with a child appears to be generally borne out in Table 5.<sup>2</sup> Compared to a child of parents who neither have a high value in child rearing, a child of parents who both have a high value spend marginally more time engaging with both parents simultaneously, more time with the father, and marginally more time with the mother. Moreover, having a father who has a high value seems to affect parents’ developmental time more when there is a “mismatch” in parents’ values. Father’s wages is negatively related to the level of time a child is engaged with him. Mother’s work hours have a similarly negative effect on the level of time she is available to a child. Consistent with the

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<sup>2</sup> Another set of analyses was conducted with parents’ work hours excluded from the models. Estimates for parental attitudinal variables in these models are very similar to those presented in Table 5. Hence, these results are not presented here.



economic demography literature (Blake, 1981), more children in the family creates a resource competition, lowering the level of parental developmental resources to each.

### **Gender Role Effects**

In Table 6, we use another non-diary measure to gauge the effect of parental beliefs and characteristics on their involvement in children's activities. Fathers' own report of the extent to which they participated in a list of housework and childcare tasks<sup>3</sup> was used to construct a measure of father's level of involvement. This can be thought of as a broader gender role measure in the sense that it extends beyond childcare and related developmental activities to routine housework. Possibly the couples who agree on the importance of developmental resources to children are those who also see a less delineated world in terms of gender roles more broadly. Sharing of the desired childcare responsibilities also comes with a sharing of the responsibilities for everyday household activities. As can be noted from the OLS estimates presented in the first column of Table 6, those couples who agree on high value of developmental inputs to children are more likely to share in a much broader set of household activities. This supports the idea that matching on childcare is part of a wider set of shared beliefs about gender roles.

Some other interesting relationships include the increase in sharing by age of child and less sharing for fathers with higher income. Here there may be a state-dependent effect in which for some time interval there is a big payoff to effort along several different lines – childcare, housework, and market work. Since this effort is tilted in the non-market direction there may be added importance to shared beliefs about gender roles in order to support time of both spouses in a range of non-market activity beyond childcare. Note that fathers' education is not positively related to sharing – fathers who are more educated, while possibly more supportive of less traditional gender roles, also have higher costs of time and may allocate more time to their careers, as indicated by the negative coefficient of father's wages. This pattern is similar to what is shown previously (in Table 5); women who have a greater role in family income generally devote less engaged time to their children. Also of interest is the finding that fathers of Hispanic

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<sup>3</sup> The listed tasks were preparing meals, washing dishes and cleaning up after meals, cleaning house, and shopping for groceries, washing, ironing and mending, choosing children's activities, selecting a child care program, preschool, or school, driving children to activities, and bathing children or changing diapers, disciplining children, playing with children, and outdoor and other household maintenance tasks and automobile maintenance and repair.

and “other” ethnic origins reported to have shared more household and childrearing tasks than white fathers, suggesting potentially important cultural factors that influence domestic division of labor in these families.

### **E. Social Capital and Parental Matching**

In this section, we examine a different type of parental investment – family social capital. We measure family social capital with father’s connection to community as indexed by his own report of whether or not he had participated in the following activities within the past month - neighborhood meeting, church or other religious club or activity (not religious service), parenting classes or parent support groups, athletic team, visiting a friend or neighbor’s house, going to an institution like a YMCA, scouting (boy scouts, girl scouts), and neighborhood watch.<sup>4</sup> Data indicate that about 10% of the children have a father who went to neighborhood meetings within the past month, 8% have a father who participated in neighborhood watch, and 4% have a father who went to parenting class or parent support groups. An index of family social capital that indicates the number of activities the father has been involved in within the last month, ranging from 0 to 8, was created as the dependent variable in this set of analysis. The index has a mean of 2 and standard deviation of 1.35. About 10.6% of the fathers had not participated in any of these activities, while 30.6%, 28.5%, and 18.4% of them participated in one, two, and three of these activities respectively.

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<sup>4</sup> We also examine the relationship between parental shared attitude and mother’s community involvement. Results in the multivariate analysis are similar in the two models.

Column 2 of Table 6 presents Tobit estimates of the family social capital. In contrast to results on parental time input presented earlier, the older a child is, the more the father is involved in community network. Also in contrast to results on parental time input, father's education is positively associated with his community involvement, suggesting that higher career families may be relying a bit more on social capital- especially as children get older. Compared to couples where neither parent has a high value report for child development, those who are both committed or couples with fathers who are highly committed tend to provide higher family social capital to children. This suggests, along the lines of the discussion in Section IA, that parents with interests in child development seek to increase a whole array of inputs to development – ranging from time of each parent, to social capital.

### **Other Materials and Resources**

We examine yet another dimension of parental investment in developmental resources as indexed by traditional measures from the Home Observation for Measurement of the Environment (HOME). A subset of the full HOME scale (Bradley & Caldwell, 1980; Bradley, Casey, & Caldwell, 1997; Bradley et al., 1994) was administered in the PSID-CDS that assesses the extent to which parents provide age-appropriate developmental materials such as toys, books, musical instruments, and stimulating experiences such as going to museums or other outings. An index was created from these items that ranges from 2 to 14 with a mean of 9.8 and a standard deviation of 2.3 (for detailed information of how this subscale is constructed, see user manual for the PSID Child Development Supplement on the study's web site).

The third column of Table 6 presents the OLS estimates of the level of stimulating learning materials and experiences that parents provide. As expected, the level of these resources increases with child's age and family's financial and human capital as measured by father's wages and mother's education. Data also show that white parents provide a higher level of stimulation to their children than parents of other ethnic origins, again suggesting some sub-cultural factors in play. Parents' shared values on childrearing, however, do not seem to have an impact on the level of such resources.

Our analyses suggest that parents with interests in child development seek to increase a whole array of inputs to development – ranging from time of each parent, to social capital and most likely other developmental resources such as indexed by traditional measures such as the HOME

Scale, and this may extend to out-of-home schooling. As a result, the assessment of inequality in early childhood development needs to be informed by measures over a large number of domains both in the home, schools and communities. One of the key measures is time input of the parents.

#### **IV. Conclusion**

These results from the Panel Study of Income Dynamics demonstrate how children's time diaries can be used to study the complex issues involved in the intra-family resource allocation behavior. Families with varying level of resources and values use different strategies to balance their work-family commitments. We see that the distribution of time resources to young children will tend to be dispersed by virtue of family public goods and a matching of couples who share beliefs about child development. These couples will not only be devoting more direct engagement and possibly more accessible time to their children, but also, as suggested by economic demography models, have smaller family sizes, producing more resources per child, and are likely to secure greater levels of social capital outside the family as another, complementary, route to enhance children's well-being. As a result, both in-home and out-of-home resources combine for a wide dispersion in resources for early child development.

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**Table 1: Time Children Spend Directly Interacting with Biological or Adoptive Parents, by Family Type**

	A Weekday				A Weekend Day			
	Intact Families	Single-mom fam.	Single-dad fam.	Other	Intact families	Single-mom fam.	Single-dad fam.	Other
<b>Total Time</b>	<b>2:15</b>	<b>1:01</b>	<b>1:07</b>	<b>0:54</b>	<b>4:42</b>	<b>1:57</b>	<b>1:30</b>	<b>1:40</b>
With both parents	0:51	0:03	0:02	0:07	2:46	0:13	0:07	0:22
With mom only	1:01	0:56	0:03	0:45	1:13	1:36	0:00	1:12
With dad only	0:23	0:02	1:02	0:02	0:43	0:08	1:23	0:06

**Table 2: Time Use for Children in Intact Families, by Mother's Work Status and Education**

	A Weekday				A Weekend Day			
	Working mother		Nonworking mother		Working mother		Nonworking mother	
	High SES* (n=1347)	Low SES (n=884)	High SES (n=575)	Low SES (n=793)	High SES (n=1347)	Low SES (n=884)	High SES (n=575)	Low SES (n=793)
STUDYING	19.9	18.7	23.1	12.1	7.8	5.61	6.8	4.9
READING	12.8	9.1	14.9	9.9	13.9	9.23	15.0	8.1
COMPUTERS	5.0	2.3	5.4	3.8	9.3	4.38	10.3	5.5
TV	79.4	100.7	80.9	104.7	117.9	137.85	100.7	131.7
ART	8.2	4.7	9.1	6.6	7.9	4.48	6.5	4.2
SPORTS	24.4	25.2	26.7	24.6	42.7	44.96	36.4	33.7
SCHOOL	336.6	342.3	227.7	213.9	5.9	1.95	5.0	10.3
SLEEP	610.2	613.0	652.5	661.0	662.4	663.3	671.1	684.1
CONVERSA- TION	6.3	4.7	8.7	6.1	6.9	5.69	12.6	6.9
EATING	71.2	66.5	82.9	80.2	91.6	83.16	94.2	86.2
HOBBIES	0.6	1.3	1.2	0.0	1.6	0.92	1.0	0.2
HOUSEHOLD WORK	37.2	25.5	39.9	39.8	73.2	87.35	81.7	70.0
MARKET WORK	0.6	0.2	2.0	0.3	3.3	0.04	0.1	0.4
OTHER LEISURE	22.1	15.4	23.3	17.0	46.4	40.28	42.1	32.3
OUTDOORS	6.8	3.9	5.8	8.3	12.7	16.77	15.9	12.5
PERSONAL CARE	72.3	69.8	71.4	71.9	77.2	76.06	80.1	80.2
PLAY	94.8	96.8	129.1	138.0	166.6	143.46	176.1	179.7
VISIT	18.5	23.3	34.6	19.3	62.5	54.18	54.1	43.5

\* high SES defined as mothers who have some college education

**Table 3: Descriptive Statistics for The Analysis Sample**

<b><u>Variables</u></b>	<b><u>N</u></b>	<b><u>Weighted Means</u></b>	<b><u>Stand dev.</u></b>
Ethnicity of father	943		
Caucasian (omitted)		0.79	0.44
African American		0.06	0.37
Hispanic		0.10	0.26
other		0.05	0.20
Father's earnings (in \$10,000)	943	3.63	3.60
Father's weekly work hours	943	43.6	13.17
Father's education	943		
Whether attended college		0.55	0.50
% mom's wage/ family income	943		
No earning or less than 25%(omitted)		0.59	0.48
25-49%		0.30	0.46
Half or more		0.11	0.32
Mother's weekly work hours	943	25.1	18.9
# children under 18 in family	943	2.24	1.03
Parental Childrearing Attitude	943		
Both High		.32	.47
Mother High Only		.18	.38
Father High Only		.23	.42
Neither High		.27	.45

**Table 4: Total Weekly Developmental Time (in minutes) A Child Spends with Parents by Parents' Attitudes toward Child Development**

	N	Engaged time	Engaged + accessible time
<b><u>ALL</u></b>			
time with both parents	943	462.17	908.76
time with father	943	623.03	1294.96
time with mother	943	789.79	1691.65
<b><u>Both High</u></b>			
time with both parents	308	496.62	942.39
time with father	308	693.20	1385.54
time with mother	308	852.87	1779.65
<b><u>Only Mom High</u></b>			
time with both parents	167	433.07	859.96
time with father	167	588.07	1279.03
time with mother	167	795.88	1598.66
<b><u>Only Dad High</u></b>			
time with both parents	209	456.67	920.86
time with father	209	618.56	1269.06
time with mother	209	808.00	1777.94
<b><u>Neither High</u></b>			
time with both parents	259	444.16	890.44
time with father	259	566.92	1219.99
time with mother	259	700.7	1582.92

**Table 5: Tobit Estimates of Total Weekly Developmental Time A Child Spends with Parents**

Variable	Both Parents		With Father		With Mother	
	Engaged + Engaged Time Only	Engaged + Accessible Time	Engaged + Engaged Time Only	Engaged + Accessible Time	Engaged + Engaged Time Only	Engaged + Accessible Time
Intercept	652.18*** (-64.92)	1109.28*** (88.20)	909.15*** (65.29)	1815.17*** (106.59)	1202.76*** (74.93)	2068.57*** (113.28)
Child's Age	-4.22 (3.37)	12.45** (4.65)	-18.19*** (3.44)	-28.18*** (5.58)	-44.13*** (4.00)	-60.58*** (6.01)
Child's Gender (boy=1)	-35.97 (24.13)	-9.19 (33.38)	-.43 (24.63)	90.42* (-39.95)	-36.82 (28.49)	38.34 (42.99)
Ethnicity (omitted=white)						
Black	-27.49 (51.89)	-57.84 (71.15)	45.55 (54.98)	16.06 (86.43)	148.75* (62.79)	-14.57 (91.64)
Hispanic	-46.79 (43.99)	97.86 (60.72)	-55.93 (45.33)	87.73 (73.00)	82.40 (51.70)	197.66* (78.43)
Other	-99.53+ (55.59)	-165.89* (77.14)	-108.91+ (56.08)	45.95 (92.82)	-8.34 (64.81)	-11.28 (98.54)
Father's Hourly Wage	-6.91 (3.97)	-1.01 (5.46)	-16.01*** (3.98)	-9.63 (6.51)	-3.71 (4.63)	-11.03 (7.03)
Father's Work Hours	.26 (.99)	-3.09* (1.36)	2.24* (1.03)	-.51 (1.66)	1.94+ (1.15)	4.54* (1.74)
Father's Education (whether college)	-1.12 (29.83)	13.28 (41.30)	43.83 (30.40)	45.87 (49.48)	33.94 (35.16)	28.04 (53.20)
Mother's Earnings/Total Family Income						
25-49%	-42.34 (34.28)	-67.60 (47.46)	.57 (34.97)	-9.18 (56.63)	9.20 (40.57)	-115.61+ (61.20)
50% and above	-38.39 (49.34)	3.69 (68.12)	29.35 (50.48)	54.18 (81.18)	-16.37 (57.79)	-38.51 (87.72)
Mother's Work Hours	1.16 (.81)	.55 (1.11)	-.23 (.82)	-2.05 (1.33)	-2.22* (.95)	-6.77*** (1.44)
Mother's Education (whether college)	-94.91** (30.06)	-134.80** (41.64)	-106.64*** (30.51)	-268.72*** (49.72)	-89.91* (35.43)	-154.35** (53.58)
Number of children at home	-54.35*** (11.81)	-39.55* (16.34)	-61.67*** (12.12)	-73.83*** (19.84)	-63.52*** (13.94)	4.54 (20.96)
Parenting Attitudes/ Values (omitted=neither high)						
Both high	52.42+ (11.81)	69.32 (16.34)	86.70** (12.12)	117.07* (19.84)	63.73+ (13.94)	87.22 (20.96)

	(31.19)	(43.21)	(31.80)	(51.75)	(36.96)	(55.76)
Mom High Only	-34.50	-15.94	-21.26	-33.94	-4.47	-79.64
	(37.23)	(51.36)	(37.86)	(61.03)	(43.83)	(66.12)
Dad High Only	6.18	26.78	23.96	34.29	51.35	155.86*
	(34.90)	(48.25)	(35.56)	(57.75)	(41.16)	(62.10)
Scale	467.56	12.10	468.77	774.82	554.41	852.1
Loglikelihood	-10600.84	-11928.1	-11070.49	-12410.42	-11900.70	-12878.54
censored n	127	59	80	32	32	5
Noncensored n	800	868	847	895	895	922

Note: \*\*\* p<.001, \*\* p<.01, \* p<.05, +p<.1

**Table 6: Estimates of the Extent to Which Fathers Share Housework and Childcare, Father's Community Involvement, and the Quality of Stimulating Materials and Experiences**

Variable	Task Sharing <sup>a</sup>	Father's Community Tie <sup>b</sup>	HOME Scale <sup>c</sup>
Intercept	22.12*** (.52)	1.26*** (.12)	8.49*** (.27)
Child's Age	.09* (.04)	.03*** (.01)	.19*** (.02)
Child's Gender (boy=1)	.01 (.26)	.11+ (.06)	-.05 (.14)
Ethnicity (omitted = white)			
Black	.87 (.56)	-.03 (.13)	-.81** (.29)
Hispanic	3.98*** (.48)	.01 (.13)	-1.99*** (.25)
Other	3.99*** (.61)	-.71*** (.14)	1.13*** (.32)
Father's Hourly Wage	-.10** (.04)	.01 (.01)	.04** (.02)
Father's Education (whether college)	.12 (.33)	0.29*** (.08)	.25 (.17)
Mother's Earnings/Total Family Income			
25-49%	.55+ (.31)	0.07 (.07)	.08 (.16)
50% and above	.46 (.47)	-.41*** (.11)	.24 (.24)
Mother's Education (whether college)	-.06 (.33)	0.12 (.08)	.59*** (.17)
Number of children at home	.24+ (.13)	.08* (.03)	-.04 (.17)
Parenting Attitudes/ Values (omitted= neither high)			
Both high	1.16*** (.35)	0.52*** (.08)	.01 (.18)
Mom High Only	0.78+ (.41)	.14 (.09)	-0.8 (.21)
Dad High Only	0.47 (.38)	0.61*** (.09)	-0.01 (.20)
ADJ. R-SQ	0.14		0.23
Scale		1.09	
Loglikelihood		-2019.63	
censored n		92	



Noncensored n

781

Note: \*\*\* p< .001, \*\* p<.01, \* p<.05, +p<.1

Note: a: OLS estimates, b: Tobit estimates, c: OLS estimates