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The Implications of Participation in Formal Child Care Arrangements for the Cognitive and Social Development of Children from Welfare Families

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Abstract

With recent legislation placing a strong emphasis on the transition of welfare mothers into the workforce, it becomes increasingly important to understand whether and how participation in child care has implications for the development of children from welfare families. This study focused on a sample of 182 African-American families, all of whom had applied for or were receiving Aid to Families With Dependent Children, and each with a child of between 3 and 5 years of age. We first examined which of a wide range of background characteristics predicted the use of a formal child care arrangement. We then examined whether the children's cognitive and social development were predicted by current participation in formal child care, above and beyond the background characteristics associated with the use of formal child care. Our results indicate that use of formal child care is associated with significantly higher scores on a measure of cognitive development.

The Implications of Participation in Formal Child Care Arrangements for the Cognitive and Social Development of Children From Welfare Families

This study examines whether participation in formal child care arrangements has implications for the development of young children from welfare families. We examine first whether, in a sample of welfare families with preschool-age children, there are family background characteristics beyond mothers' employment that predict the use of a formal child care arrangement. We then explore whether measures of the children's cognitive and social development are predicted by current participation in formal care above and beyond the family background characteristics that predict child care use.

Policy Context

The new national legislation governing aid to needy families (The Personal Responsibility and Work Opportunity Reconciliation Act of 1996) focuses heavily on the transition off of welfare and into employment. Under the new legislation, welfare is no longer an entitlement, and there is a total cumulative limit of five years (or less at state option) for the receipt of assistance. Although states are granted substantial latitude in developing their specific policies, all states are required to develop plans for requiring families to work after receiving assistance for two years. In addition, states are subject to penalties if a certain percentage of their caseload is not in work or work-related activities. The percentage of families receiving assistance who are required to participate in a work activity increases from 25% of all families in 1997 to 50% in 2002 and after. Recipients can fulfill the work requirement by participating in subsidized or unsubsidized employment, on-the-job

training, community service, or vocational training (for a period of 12 months). Job search activities can count toward the work requirement, but only for up to 6 weeks. There are some differences in hours of work and types of activity that qualify as fulfilling the work requirement for two parent versus single parent families and according the age of the recipient. For example, for recipients up to the age of 19, participation in school can fulfill the requirement.

While the new legislation establishes work requirements at a national level, it also permits states to set even more stringent requirements. A number of states have already passed legislation which requires recipients to work shortly after they begin to receive assistance. For example, Wisconsin requires all participants, except pregnant women and those with a child younger than 12 weeks of age, to work a minimum of 28 hours per week; for most recipients the requirement is a standard 40 hour work week. Florida is requiring up to 40 hours of work a week for all recipients with exceptions for pregnant women and mothers of children under 3 months of age. Virginia requires almost all recipients to find work within 90 days or lose benefits. In these three states, sanctions for not working occur relatively quickly and are substantial.

The national work requirements and the state variations all carry with them the implication that more children from welfare families will be participating in child care settings.

In recognition of the increased need for child care implied by the work requirements, the welfare bill provides increased money for child care through the Comprehensive Child Development Block Grant. A number of states are also reorganizing their child care subsidy programs to provide greater funds and easier access to child care.

Previous Research on Use of Child Care by Welfare Families

While the new legislation thus seeks to increase employment by welfare mothers, and recognizes that such employment will increase the participation of children in child care settings, we know very little about the implications of child care for the development of children from welfare families. The research to date on use of child care by recipients of public assistance has been descriptive in nature, focusing on the *types of care preferred and actually used* by such families, and the *limitations on program participation or employment posed by problems in arranging for child care*.

Such research suggests that welfare mothers tend to rely more than other groups of mothers on "informal" child care arrangements, that is care by relatives and friends rather than care in child care centers or licensed family day care homes. For example, in one recent study focusing on welfare mothers who were employed, approximately two-thirds reported relying on informal care (Bowen and Neeman, 1993).

Yet some researchers note that this pattern of reliance on informal child care should not be viewed as the preference of welfare mothers. The use of formal child care settings has been found to be related to families' use of child care subsidies, suggesting that the greater reliance on informal care among welfare mothers may reflect financial barriers (Meyers and van Leeuwen, 1992; Siegel and Loman, 1991). Several studies of welfare-to-work programs in which child care subsidies were available have documented increases in the use of *formal* child care arrangements. For example, in GAIN, California's welfare-to-work program under previous welfare legislation, mothers indicated

a preference for formal child care arrangements at the time of enrollment, and three months after enrollment there had been substantial increases in mothers' reliance on child care centers and licensed day care homes (Gilbert, Berrick and Meyers, 1991). Bowen and Neenan (1993) report that welfare mothers relying on formal child care arrangements were more likely to report preferring their current arrangement than mothers using informal child care. Type of child care used by welfare families may also be affected by the availability of different forms of care in their communities.

Studies of welfare-to-work programs point to child care as an important factor in mothers' program participation. For example, in a further study of participants in California's GAIN program, 72 percent of mothers sampled said that issues related to child care had been a constraint on their work or educational activities during the previous year, with cost of care cited most frequently as a source of difficulty (Gilbert, Berrick and Meyers, 1991). A study of the utilization of child care by welfare recipients in Illinois found that 81 percent of those who worked or went to school reported the cost of child care as a problem, 73 percent reported problems with transportation to child care, and 52 percent reported having trouble finding care (Siegel and Loman, 1991).

Children's Development in Low-Income Families in Light of Child Care Participation

Yet the further key question of how participation in child care is related to the development of children in welfare families has remained virtually unexplored. Most of the research on the effects of child care for low-income families focuses on the implications of early intervention programs, rather than on the implications of child care available to families in their communities. While there is a small set of studies that does consider the development of low-income children in light of

participation in community-based child care, the research samples in these studies have not been defined specifically in terms of welfare receipt. The possibility exists that the implications of child care participation may differ for children from welfare families and from more heterogeneous samples of low-income families. Samples defined as low-income may differ from samples defined specifically in terms of receipt of public assistance in terms of such characteristics as the proportion of families headed by a single parent, the proportion of families with an employed parent, and eligibility for child care subsidies.

The research examining the development of low income children in light of participation in high quality early intervention programs is encouraging. Results show positive short-term impacts on children's cognitive development (e.g., Burchinal, Lee and Ramey, 1989; Bianci and McArthur, 1993; Collins and Brick, 1993) as well as some evidence of long-term positive impacts in this domain of development (Darlington, Royce, Snipper, Murray and Lazar, 1982; Ramey and Campbell, 1991).

Yet the relevance of these findings to the current policy context is limited. The new legislation does not envision the placement of children from welfare families in model early intervention programs. Research indicates an association between the cost and quality of child care (Helburn et al., 1995). It is unlikely that those receiving child care subsidies will be able to afford the highest quality center care (Helburn et al., 1995). As welfare mothers come increasingly to be employed, their children will likely be in community-based, rather than university-sponsored model child care settings. Further, research on community-based center care indicates that the quality of

such care varies substantially, with most programs falling in the middle to low quality range (Howes, Phillips and Whitebook, 1992).

While there are no studies that we can turn to specifically focusing on children from *welfare* families using community-based child care, there are a handful of relevant studies focusing more broadly on *low income* families using community-based child care settings. A consistent pattern emerges across these studies. Even when it is not in early intervention settings, child care appears to be associated with more positive development among children from disadvantaged families.

In one recent study, Caughy and colleagues (Caughy, DiPietro and Strobino, 1994) examined the cognitive development of five and six year old children in the 1986 wave of the National Longitudinal Survey of Youth Child Supplement in light of their use of child care in the first three years of life. The sample was divided into low, moderate and higher income groups. Findings indicate that for children from the lower income group, participation in any form of child care during each of the first three years of life predicted better reading recognition scores (as assessed using the PIAT reading recognition test). By contrast, children from the middle income group had higher reading scores only in association with child care participation in the third year of life. Further, child care participation in any of the first three years was not associated with higher reading scores for children in the upper income group, and indeed child care attendance in the first year was associated with lower reading scores in this group. Thus, child care participation appeared to function as a protective factor particularly in the cognitive development of children from the most disadvantaged economic circumstances.

Burchinal, Lee and Ramey (1989) contrasted the cognitive development of 131 preschoolers who were enrolled (1) in high quality early intervention programs, (2) in community-based child care centers that were of high quality, or (3) whose parents chose to use limited child care (less than 12 months in community-based child care) or no child care. The children in the high quality community-based settings exhibited higher IQ scores (measured using the McCarthy Scales of Children's Ability) than those children with limited child care experience, although their scores were not as high as those of children in the intervention-type settings. In this study, participation in intervention child care as well as in community-based child care of high quality lessened the widely cited trend for low-income children of a decline with age in cognitive test scores. Unfortunately, this study did not examine the development of children in community-based child care centers that were more broadly reflective of the quality of such care.

A recent study using a nationally representative sample also reports that participation in child care is predictive of more positive developmental status in young children. Zill, Collins, West, and Germino Hausken (1995) examined the school-readiness skills of four year old children in the 1993 National Household Education Survey in light of their child care participation. Participation in a formal child care setting (e.g., child care center, family day care home) was associated with significantly higher scores on an assessment of child literacy. This finding held for low-risk as well as high-risk families, with families being placed in the high risk category when they had incomes below the official poverty level, had parents who had not completed high school, were headed by a single parent, or were headed by a parent or parents who were unmarried at the time of the child's

birth.

The Issue of Self-Selection into Child Care

While there are thus several studies that suggest that participation in community-based child care settings may have positive implications for the development of young children from low-income families, a critical caveat to the interpretation of these findings is that families that make use of child care for their young children may differ in important ways from families who who do not. The apparent benefits of child care participation for low-income children may be rooted in the factors that predict child care use (i.e. self-selection factors for child care participation), rather than in the children's experiences in child care.

The issue of self-selection was carefully considered in the work of Caughy and colleagues (1994). Analyses indicate that the positive association between child care participation and cognitive outcomes persisted even with the inclusion of statistical controls for maternal education, family income, family race/ethnicity, the enrollment of the child in school, and a measure of the cognitive stimulation and emotional support available in the home environment. However, Caughy and colleagues caution that there may be further variables not measured in their analyses that may be both predictive of the use of child care and important to child outcomes. They point especially to the need for studies to control for maternal motivational variables and the mother's employment status.

An examination of other recent research permits us to extend the list of factors that predict the use of child care by families. Use of child care appears to be related to child age: families are

more likely to use child care when their children are between the ages of three and five rather than younger (West, Germino Hausken and Collins, 1993; Gilbert, Berrick and Meyers, 1991). Families that have more children in the home, and that have a grandparent or other adult living in the home, are less likely to use child care (Leibowitz, Waite, and Witsberger, 1988). Further studies confirm findings of Caughy and collegues that child care use is higher among African American families than among White and Hispanic families; among families in which the mother is employed; and among families in which the mother has higher educational attainment (Leibowitz, Waite, and Witsberger, 1988; West, Germino Hausken and Collins, 1993). It is important to note that while maternal employment is a significant predictor of the use of child care, many children with mothers who are not employed participate regularly in child care. For example, in the 1991 National Household Education Survey comprised of parents of 5,091 children between the ages of three and five, almost 60 percent of five year old children of mothers who were not employed were enrolled in center-based child care programs (Hofferth, West, and Henke, 1994).

When considering self-selection into child care specifically in a sample of welfare families, the caution of Caughy and colleagues to consider a broad range of variables, and especially maternal motivational variables, seems particularly important. For example, symptoms of depression are much more widespread among mothers receiving welfare than in the general population (Moore, Zaslow, Coiro, Miller and Magenheim, 1995). Depression might impede a mother's energy or motivation to seek out stimulating out-of-home experiences for herself or for her young children. Previous research points to family stress as a possible factor predictive of the choice of center care

of higher or lower quality. Families reporting higher stress tend to use lower quality center care (Howes and Stewart, 1987; Howes and Olenick, 1986). Welfare families have been documented to face multiple serious stressors (e.g., threat of eviction; friend or relative in jail; see Moore et al., 1995). Perhaps in welfare families, stress would be associated with less use of child care. Given that variables reflective of maternal psychological wellbeing and family stress are also strong predictors of children's development (Downey and Coyne, 1990; Hall, Williams and Greenberg, 1985; Goodman, Brogan, Lynch and Fielding, 1993; Luster and Duboy, 1992) it would seem particularly important to extend the examination of self-selection into child care settings to include variables reflective of maternal psychological well-being.

Further variables that may warrant consideration as predictors of child care use as well as child outcomes may not have been considered in previous research because they are specific to low income or welfare families. For example, it may be important to examine families' use of benefits other than child care or welfare, such as subsidies for housing. Gilbert, Berrick and Meyers (1991) have noted that not all welfare families are aware of the child care subsidies that they are eligible to receive. Perhaps some welfare families are more informed about, and are more likely to access, benefits of various kinds. In addition, it may be important to examine such variables as time on welfare as a predictor of child care use. Work by Moore and colleagues (1995) indicates that children's development is negatively associated with years on welfare. Furthermore, children in poverty are more likely to have health problems from birth (Klerman, 1991). There are some indications that health and developmental complications in children limit mothers' employment

(Galambos and Lerner, 1987). Perhaps health factors like low birthweight would be linked with child care use in a welfare sample. Variables that may be particularly important within a welfare population will also be included as possible predictors of child care use and child outcomes.

The present work seeks to build on and go beyond previous research in a number of ways. First, this study focuses on the implications for children's development of child care use specifically within a *welfare sample*. Second, we examine the implications of *community-based formal child care programs* rather than model early childhood intervention programs.[1] Third, we examine a *wide range of maternal and family variables as possible predictors of the use of child care* within this sample, including variables reflective of maternal psychological well-being and variables such as housing and time on welfare that may be particularly important within a welfare population. We employ the strategy identified as crucial in previous research of asking *whether any implications of child care participation persist when variables predictive of the use of care in our sample are taken into account*. Finally, while most previous work focuses on the cognitive domain of development in light of child care participation, *we extend this approach to the consideration of young children's development in the social as well as cognitive domain.*

Methodology

The JOBS Child Outcomes Study

[1] Head Start programs, while a form of formal child care that is available through local communities, may at the same time be considered a form of early intervention. In our analyses and reporting of findings in the text of this paper, we have included children attending Head Start in the group attending community-based formal child care. However analyses have also been run excluding those children attending Head Start, to confirm that findings hold without this subgroup. These results are reported on briefly in footnote 6.

The current analyses have been carried out using the first wave of data from the JOBS Child Outcomes Study, a study undertaken to understand the implications for young children of policies enacted in response to prior welfare legislation, the Family Support Act of 1988. The JOBS Child Outcomes Study is a component of the larger national evaluation of the Federal Job Opportunities and Basic Skills (JOBS) Training Program, the programmatic response to the Family Support Act of 1988. The JOBS Program required eligible welfare recipients to participate in educational or job search activities in order to enhance their economic self-sufficiency. Sanctions could be applied (i.e., welfare benefits reduced) for those failing to participate in such activities without basis for exemption. Although services were directed primarily at adults, the JOBS Program also provided child care and Medicaid benefits for the children of welfare recipients. Child care benefits were provided if they were necessary for the mother to participate in educational or employment-related activities. Both child care and Medicaid benefits continued for a year following a mother's transition off of welfare and to employment. Findings regarding the implications for children of the JOBS Program will continue to be informative in the present policy context. JOBS anticipated the employment focus of the current legislation, though it differed in such key respects as the establishment of time limits, the entitlement status of welfare, latitude given to states in defining their specific policies, and emphasis placed on job preparation activities as opposed to actual employment.

The evaluation of the impacts of the JOBS Program on adults' employment, education and economic status, the JOBS Evaluation, is being conducted by Manpower Demonstration Research

Corporation (see Hamilton and Brock, 1994 for more information on the JOBS Program and Evaluation), while the evaluation of the effects of JOBS on children's development is being conducted with a subset of the full evaluation sample by Child Trends, Inc. under subcontract to MDRC (see Moore et al.1995; Zaslow, Moore, Coiro, & Morrison, 1995)[2]. In the JOBS Child Outcomes Study, the development of three groups of children is being followed longitudinally: those whose mothers were randomly assigned within the JOBS Evaluation to be in the JOBS human capital development group (required to participate in basic education in order to enhance their long-term employment prospects); to be in the JOBS labor force attachment group (required to participate in job search activities to move quickly into employment); or to be in the control group (free of the mandatory participation requirements but still receiving all welfare benefits).

Mothers participating in the JOBS Child Outcomes Study all had a youngest child between 3 and 5 years of age at the time they enrolled in the evaluation. This child was designated as the "focal child," the child in each family selected for follow-up. If there was more than one child in this age range within a family, the focal child was randomly chosen from among them. Measures of the focal children's health, social relationships, adjustment, and cognitive development are being collected two and five years after their mothers enrolled in the study. The JOBS Child Outcomes Study focuses not only on developmental outcomes, but also on possible mechanisms through which the JOBS Program might affect development. Thus, the study also obtains measures of parent-child

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[2] The JOBS Evaluation and the JOBS Child Outcomes Study are being carried out with funding from the U.S. Department of Health and Human Services and Department of Education. Additional funding to support the Child Outcomes portion of the JOBS Evaluation is provided by the following foundations: the Foundation for Child Development, the William T. Grant Foundation, and an anonymous funder.

relations, mother's psychological well-being, school and neighborhood context, mother's educational and employment activities, family economic status, and children's child care participation. At present all data for the two year follow-up of the JOBS Child Outcomes Study have been collected, and the five-year follow-up study is in the field.

While the JOBS Child Outcomes Study is ongoing in three sites (Fulton County, Georgia, Kent County, Michigan, and Riverside County, California), in one of the study sites, Fulton County Georgia, an additional data collection wave, called the JOBS Descriptive Survey, was also completed soon after the random assignment of mothers to the control group or one of the experimental groups within the evaluation. Data from this further data collection wave are the basis for the present analyses. The Descriptive Survey was carried out on average 3 months after random assignment in order to provide a detailed descriptive picture of the well-being of the mothers and children in the sample, and of the factors associated with the children's development, close to the start of the evaluation.

The Descriptive Survey involved 90-minute in-home interviews and child assessments. All interviewers for the Descriptive Survey were African-American women. Interview data were collected concerning the mother's educational and employment activities and history, household composition, mother's psychological well-being, the cognitive stimulation and emotional support available to the focal child in the home environment, parent-child relations, the child's participation in non-maternal care, and involvement with the child of other family members. Direct assessments were obtained of the child's cognitive development, and mothers reported on the child's health status

and social maturity.

Sample For Analyses

The present analyses were carried out with control group members participating in the Descriptive Survey. We chose to focus on the control group because at the point of the Descriptive Survey, only 3 months on average after random assignment within the JOBS Child Outcomes Study, there were already significant group differences in child care participation, with families in the experimental groups relying significantly more on child care (Moore et al., 1995). Because membership in one of the study's two experimental groups involved mandatory participation in educational or employment activities for the mothers, and because such participation rapidly affected the use of child care for preschoolers, we hypothesized that self-selection factors for use of child care would differ for those in the experimental groups of the JOBS Child Outcomes Study and for those in the control group, for whom use or non-use of child care occurred spontaneously. In addition, the Descriptive Survey sample is predominantly (96%) African-American. Because child care use as well as self-selection factors for use of child care have been found to differ by family racial/ethnic background (Fuller, Holloway and Liang, 1996), we further restricted our sample to the African-American families in the Descriptive Survey sample. Finally, because the large majority, (95%), of families in the Descriptive Survey who were using a regular child care arrangement were using a formal child care arrangement (defined here as regular participation in a child care center, preschool, nursery school, Head Start program, or before- or after-school care program), we focused our analyses only on those families using a formal child care arrangement and those with no regular

child care arrangement.[3] Thus, the sample for our analyses is the group of 185 African-American families from the control group of the Descriptive Survey sample, who either participated in a formal child care arrangement or who had no regular child care arrangement.

Table 1 provides descriptive information on the families in the sample. All of the mothers in the sample had applied for or were receiving welfare. As can be seen in the table, 82% of the mothers in the sample had received welfare for a total of two or more years prior to enrollment in the JOBS Child Outcomes Study. The Fulton County, GA, site of the JOBS Child Outcomes Study excluded teenage mothers. Thus, although some of the mothers had given birth as teenagers, all of the mothers in our sample were 20 years of age or older at the time of enrollment in the evaluation. Seventy percent of the mothers had never been married, and 29% were separated, divorced or widowed. Only 1% of the mothers were married and living with their spouses at the time of the study. A majority of the mothers in this sample (54%) had completed high school or received a GED but had not gone on to college, while 36% has no high school degree. Sixty-two percent of the mothers had one or two children while 38% had three or more children. Children, 52% of whom were female, ranged in age from 40 to 64 months at the time of the Descriptive Survey, with a mean age of 53 months.

Measures

Participation in a Formal Care Arrangement. Current use of child care was ascertained

[3] The heavy reliance on formal child care in this sample, by contrast with other samples of welfare families, may reflect the availability of such care in Fulton County Georgia and the fact that child care centers in this area provide transportation.

during the Descriptive Study interview by asking mothers whether they had any regular child care arrangement for the focal child, with regular child care defined for the mothers as an arrangement that had been used at least once a week for the previous four weeks. If the mother indicated that she was using a regular child care arrangement for the focal child, she was asked to identify the type of care. We label here as "formal child care" those arrangements that the mother identified as a child care center, preschool, nursery school, Head Start program, or before- or after-school program. In our analyses we distinguished between those with no regular child care arrangement and those participating in a formal child care arrangement on a regular basis.

Variables Considered As Predictors Of Regular Child Care Use. We considered six sets of variables as possible predictors of the use of a regular formal child care arrangement at the time of the Descriptive Study: (1) fixed (that is, unmalleable) characteristics of the mother and child, (2) family housing circumstances, (3) variables reflective of the mother's human capital, (4) variables reflective of the mother's psychological well-being, (5) cognitive stimulation and emotional support available to the focal child in the home environment, and (6) mother's current employment status.

Fixed characteristics of the mother and child that we considered as possible predictors of child care use were maternal and child age, child gender and the child's birth weight. Our examination of *family housing circumstances* included type of housing the respondent lived in (whether or not the family lived in public housing or subsidized housing), the number of times the family had moved in the past two years, the number of children living in the household, and whether

at least one of the respondent's parents (the child's grandparent) lived in the household.

Mothers' human capital, or potential to work and maintain employment, was measured through indices of maternal literacy and math skills, obtained through direct assessment, and maternal reports of educational attainment, time receiving welfare benefits, and number of months prior to enrollment in the evaluation of employment and participation in education or job training activities. Literacy was measured using the document literacy scale of the Test of Applied Literacy Skills (TALS), which was developed by the Educational Testing Service (Kirsch, Jungeblut, Jenkins, and Kolstad, 1993). Math Skills were measured by the Greater Avenues for Independence (GAIN) Appraisal math test which was developed for evaluation of the California GAIN Program, and assesses basic computation and math skills in a practical and functional context (Armstrong et al., 1989). To determine educational attainment, mothers were asked whether they had completed a GED, a high school diploma or some degree more advanced than a high school diploma. For analytic purposes, having a high-school diploma and having obtained a GED were given the same value. [4]

Measures of the *mother's psychological well-being* included indices of locus of control, depression, social support, and the number of difficult life circumstances the mother had encountered during the past year. Locus of control was assessed using the Pearlin Mastery scale (Pearlin, Liberman, Menaghan, and Mullan, 1981). An internal locus of control reflects a greater sense of control over events in one's life. Internal consistency (Cronbach's alpha) for the Pearlin Mastery

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[4]Because this variable is used as a continuous variable with higher values involving more educational attainment, the small number of people who had received a GED unnecessarily skewed the distribution when GED attainment was considered as a separate category.

scale was .70 in our sample. Depression was assessed using the 20-item Center for Epidemiological Studies Depression Scale (alpha=.83 in our sample). This measure has been found to distinguish between clinically depressed individuals and others (Devins and Orme, 1985). A measure of Social Support was developed for use in the Descriptive Study and has an alpha of .71 in our sample. A 13-item index, adapted from the Difficult Life Circumstances scale (Barnard, 1988), was used to measure the number of hassles and serious problems the mothers had encountered during the past year. Individual items on this measure are not presumed to be intercorrelated, and thus we did not examine internal consistency.

The home environment was measured using the abbreviated version of the HOME Inventory developed for use in the National Longitudinal Survey of Youth-Child Supplement (Baker & Mott, 1989). We utilized the two subscale scores (Cognitive Stimulation and Emotional Support) used in the National Longitudinal Study of Youth-Child Supplement[5]. Comparable to the Difficult Life Circumstances scale, the HOME Inventory is conceptualized as a measure of the number of risk factors present in the child's home environment. Risk factors are not assumed to be intercorrelated, and thus we do not report internal consistency. Finally, we assessed the mothers' *current employment status* through direct report by the mother of whether or not she was employed at the time of the Descriptive Study.

Child Outcome Measures. The Caldwell Preschool Inventory and the Personal Maturity Scale were used to measure school readiness and socioemotional development respectively. The

[5]Because only 1% of the mothers were married and living with their spouses we removed the item pertaining to eating meals with the mother and father from the Emotional Support subscale.

Caldwell Preschool Inventory is a 32-item inventory of skills and concepts that are directly related to school success (Caldwell, 1970). Areas assessed include knowledge of numbers, colors, and shapes; concepts such as "under" and "behind;" and the meaning of words such as "breakfast." Scores on the Preschool Inventory represent the total number of items that the child answered correctly, and may range from 0 to 32. Several studies have shown the Preschool Inventory to be sensitive to the effects of developmentally-oriented preschool programs, including the Head Start Planned Variation Study, and the evaluation of Even Start (St. Pierre, Swartz, Murray, Deck, and Nickel, 1993).

The Personal Maturity Scale is a 14-item mother report measure of the child's socioemotional development which was adapted from the 1976 National Survey of Children. The mother rates on a scale from 0 (my child is not at all like that) to 10 (my child is exactly like that) such items as "Doesn't concentrate, doesn't pay attention for long;" and "Is loving and affectionate." In the Beginning School Study, a study of children's academic and social development in the early years of elementary school, teacher-reported scores on the Personal Maturity Scale predicted parent and child expectations for the child's achievement, parents' estimates of children's academic ability, and children's report card grades, net of the child's performance on standardized tests (Alexander & Entwisle, 1988).

Strategy of Analysis

Predicting the Use of a Regular Child Care Arrangement. As a first step in examining the predictors of child care use, we examined bivariate relations between each of our discrete predictor

variables (the individual measures comprising our six groupings of variables) and regular use of a formal child care arrangement, using logistic regression. Based on these analyses we selected variables for inclusion in multivariate models predicting the use of a regular child care arrangement at the time of the Descriptive Study (Hosmer and Lemeshow, 1989). Following procedures suggested by Mickey and Greenland (1989), those variables exhibiting relations with child care use at a significance level of $p < 0.25$ were included in the multivariate model. We also examined the intercorrelations across our predictor variables for multicollinearity.

For the multivariate analyses we used logistic regression, examining the association between each set of predictor variables and the use of a formal child care arrangement. Six models were considered, each model *cumulatively adding* a set of variables for consideration. In the first model, only the variables reflecting fixed characteristics of the mother and child were considered as predictors of the use of a regular child care arrangement. Then, in sequence, variables reflective of the family housing circumstances, measures of the mother's human capital, psychological well-being variables and the home environment variables were added. The final model added current employment. Current employment was added last to permit examination of whether variables that had previously predicted use of child care remained significant predictors even when employment was considered.

Examination of Child Outcomes in Light of Child Care Use. In our final analyses we considered whether child care was a significant predictor of the two child outcome measures *when variables found in the preceding analyses to be predictors of child care use were taken into account.*

For these analyses we used ordinary least square regressions predicting to children's scores on the Preschool Inventory and the Personal Maturity Scale. A single model predicting to each child outcome was estimated. This model included current use of child care with standard control variables (age and gender of child) as well as each of the measures found in the previous analyses to predict significantly to the use of a regular child care arrangement.

Results

Predicting the Use of a Regular Child Care Arrangement

Descriptive findings on child care use. Forty-four percent of the families in our sample were using a formal child care arrangement on a regular basis at the time of the Descriptive Survey, while 56 percent were not using a regular child care arrangement. While 86 percent of working mothers in our sample were using child care, 36% of non-working mothers were also using child care on a regular basis, a pattern similar to that found in the 1991 National Household Education Survey (Hofferth, West, and Henke, 1994). Very few children (1%) were in multiple arrangements. When they were participating in a formal child care arrangement, children spent an average of 36 hours per week in child care.

Bivariate analyses. In preliminary analyses, bivariate logistic regressions were conducted to examine the role of individual variables in predicting the use of a formal child care arrangement. As noted above, those variables with a p-value less than .25 will be included in our multivariate analyses. Results of these preliminary analyses are presented in Table 2.

As has been reported previously for other samples, the age of the child played a role in use

of a formal child care arrangement ($\beta = .04$, $p < .18$). The older the child, the more likely the family was to use formal care. Neither age of the mother or child's birthweight were significantly associated with use of a formal child care arrangement and were subsequently dropped from the multivariate analyses. Although gender of the child did not show any relation with use of formal care, we retained it in the multivariate analyses as a standard control variable.

All of the variables representing the family housing circumstances, the quality of the home environment and current employment status were significant at high enough levels to be considered in the multivariate models. Regarding the mother's human capital, all of the variables were retained in the multivariate models except the mother's math score, which was not related to the use of a formal child care arrangement. Finally, there was only a single marginally significant result for the variables reflective of maternal psychogical well-being. Those mothers who had higher scores on the measure of locus of control (or a more internal locus of control) were more likely to use formal child care on a regular basis ($\beta = .49$, $p < .11$). Depression, social support and difficult life circumstances did not show sufficient levels of association with use of formal care and were dropped from the multivariate analyses. We did not find indications of multicollinearity among the predictor variables and therefore retained all the remaining predictor variables in the multivariate analyses.

Multivariate analyses. The log odds estimating the effects of the independent variables on the use of formal child care are presented in Table 3. In Model 1, the fixed variables (age and gender of child) together did not significantly affect the odds of using formal care. In Model 4, locus of control did not significantly affect the odds of using formal child care. By contrast, the sets of

variables related to family housing circumstances, mother's human capital, the quality of the home environment, and current employment each affected the likelihood of using formal care.

The cumulative addition of sets of variables produced two interesting shifts in significance levels for individual variables. The addition of the variables representing the mother's human capital reduced the importance of the number of children in predicting use of formal care, and boosted the importance of living in public or subsidized housing. We were particularly interested in seeing whether independent variables decreased in importance once we entered current employment into the final model. In general, this was not the case.

In the final model, with all variables considered simultaneously, we see that the likelihood of having a formal child care arrangement increased marginally when the focal child was older. Use of a formal child care arrangement was about three times more likely when the family lived in public or subsidized housing. In addition, children were more likely to be in a formal child care arrangement when their mothers had more months of previous participation in school or training, and when their homes afforded the children more cognitive stimulation and emotional support. Use of a formal child care arrangement was more than eleven times more likely when the mother was currently employed.

Predicting the Child Outcomes

Next, we carried out ordinary least squares regression analyses, regressing the two child outcome measures (the Preschool Inventory and the Personal Maturity Scale) on current use of a formal child care arrangement, controlling for all of the variables found to be significant predictors

of use of a formal child care arrangement in the final model in Table 3. Results of these analyses are presented in Table 4 (for the Preschool Inventory) and Table 5 (for the Personal Maturity Scale).

Results indicate that current use of a formal child care arrangement was predictive of the measure of the child's cognitive but not social development. Whether the child was currently in formal child care did contribute to our ability to predict the child's Preschool Inventory score even after controlling for the variables that were found to be associated with use of formal care (see Table 4). Along with current use of formal care, the child's age and the extent of cognitive stimulation in the home were positive predictors of the child's school readiness, whereas residence in public or subsidized housing was a negative predictor.

By contrast, as can be seen in Table 5, children's participation in formal child care does not predict their scores on the Personal Maturity Scale. Yet children from homes that provided more emotional support had higher Personal Maturity Scale scores. As for the Preschool Inventory, whether the child is living in public or subsidized housing does account for a significant amount of the variance in the child's Personal Maturity score, with children living in public or subsidized housing described by their mothers as less mature.[6]

Discussion

This study sought to address two questions: First what are the predictors of use of a formal

[6]The same sequence of analyses described above (bivariate, multivariate logistic regression and OLS regression) were also run on the sample excluding the children participating in Head Start. Results were nearly identical. In the final logistic regression model, public and subsidized housing, number of months in training, more emotional support in the home and employment all predicted the use of formal child care. The one difference here is that cognitive stimulation in the home no longer predicts use of formal child care. As for the full sample, in the final regression analyses, current use of formal child care predicts the Preschool Inventory score but not the Personal Maturity Scale score.

child care arrangement specifically in a sample of families receiving welfare? Second, is the development of children in a welfare sample associated with participation in a formal child care arrangement even when factors predicting the use of such an arrangement are taken into account?

Our results replicate several previous findings regarding the predictors of child care use, extending these patterns to a welfare sample. Focusing only on findings that were significant at the multivariate level, our findings are in accord with previous reports that families with older children (within the range of 3 to 5 years) are more likely to use child care. As in previous research, we found that mothers who are currently employed are more likely to use child care. Our results extend the pattern to the time mothers have spent preparing for employment through schooling or job training.

A finding that is new to our study, and that may be specific to low-income or welfare families, is that families living in public or subsidized housing were more likely to be using formal child care arrangements regularly. It is possible that some mothers are better informed of the range of benefits for which they are eligible, and may thus be receiving not only income support but also child care and housing support. Alternatively, it is possible that child care centers may be established specifically in areas with public or subsidized housing, and that mothers in such housing have easier access to such care. It is noteworthy that while residence in public housing was a positive predictor of the use a formal child care arrangement, (which was, in turn, a positive predictor of child cognitive development), residence in public housing, in itself, was a negative predictor of children's cognitive and social outcomes. Previous research identifies such neighborhood characteristics as the proportion of families in poverty to help to explain measures of

children's development (Susman-Stillman, 1997). Residence in public housing may be an important marker of such neighborhood characteristics.

The association that we found between use of formal child care and the quality of the home environment (see also, Caughy et al. 1994; Fuller et al., 1996) is particularly interesting. Those children receiving more emotional support and cognitive stimulation in the home were also more likely to be participating regularly in formal child care arrangements. It is noteworthy that this pattern holds even when such variables as maternal literacy, education, and current employment are taken into account. There may be a tendency for certain families to place greater emphasis on the provision of stimulation and support to their children; such families may seek to do so both inside and outside of the home.

In response to the suggestions of previous researchers, in these analyses we examined the role of variables reflective of maternal psychological well-being in predicting child care use. However we found little evidence of a relationship. None of the psychological well-being variables were significant predictors of use of a formal child care arrangement in the multivariate models.

With regard to the second question underlying these analyses, that of the relation between use of formal child care and child outcomes, our findings are in agreement with previous reports that participation in community-based child care is associated with more positive development in children in low-income samples, at least in terms of cognitive development. Our findings go beyond previous research in indicating that this pattern holds when a broader range of self-selection factors are taken into account than has previously been considered, and for a sample comprised entirely of

families receiving welfare benefits.

These findings may be seen as suggesting that current efforts to move welfare mothers towards employment and greater reliance on child care may have positive implications for preschool-age children's development and especially their school-readiness. Yet as we have noted, the possibility exists that in the context of mandatory welfare-to-work programs, child care may be used by families with different initial characteristics and may differ in its implications for children. First, with pressure to initiate employment and perhaps find child care quickly, the self-selection factors involved in use of child care may differ from those we have identified within a sample of welfare mothers free of the requirements of a mandatory program. The possibility exists that welfare-to-work programs diminish the role of self-selection by exerting pressure on more diverse families to enroll their children in child care. This might mean that child care would be used by welfare families providing less cognitive stimulation and emotional support in the home or whose mothers have less job training or education.

In addition, if local policies result in many mothers simultaneously seeking child care arrangements for their children, pressures on local child care systems may increase. Local administrators of child care services have expressed the concern that under such circumstances, more mothers may turn to unlicensed care (that may be of lower quality), than has been the case in the past. Thus, there may be differences in the quality of care used by families when mandatory programs are widely implemented. If many children receive care below a certain quality threshold, the positive associations that we have documented in our sample between participation in child care

and child outcomes may no longer hold. It is crucial to follow up on the present analyses by examining these patterns for families who do not choose child care spontaneously (as did the families in our sample) but rather enroll their children in care because they are participating in mandatory welfare-to-work programs.

Our findings pertain specifically to preschool-age children. As we have noted, the work requirements under the new legislation may now apply to mothers with infants and toddlers. Further work is needed to examine the implications of participation in formal (as well as informal) child care for infants and toddlers when mothers are fulfilling mandatory work requirements. Irrespective of age group considered, future work should seek to examine the implications of child care participation for children's development *longitudinally*. The present findings reflect only on concurrent relations between participation in formal child care and measures of development. It is important to examine also whether such participation has enduring implications.

Finally, we must note the important caveat that while our study encompasses a broader range of variables that may predispose families to the use of child care than has previously been considered, it is virtually impossible to claim that a study has been exhaustive in examining self-selection factors. The possibility remains that unmeasured characteristics of the mothers, children, or family circumstances are associated both with the use of child care and with the development of children, and that such unmeasured variables play a role in explaining the relation between child care participation and child cognitive development. Future work should continue to expand the set of variables considered as predictors of child care use in welfare as well as in other samples.

In sum, we find that welfare families within our sample who select spontaneously to use formal child care arrangements for their young children show several of the same characteristics that have been found in other samples to predict child care use (e.g., older child age, mother's employment), but also some characteristics specific to our sample (e.g., use of public or subsidized housing). Even with such variables taken into account, children in this study scored higher on a measure of school readiness when they were participating in formal child care arrangements on a regular basis. Future work is needed to examine whether similar patterns occur when mothers (of infants and toddlers as well as preschoolers) seek child care in the context of mandatory welfare-to-work programs, to examine relationships between child care participation and child outcomes longitudinally, and to examine the wide range of variables that may predict to the use of child care.

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Table 1.
Characteristics of the Study Sample

Years on AFDC	
less than 2 years	17%
2 or more years	83%
Marital Status	
never married	71%
ever married	29%
Educational Attainment	
no degree	37%
at least High School/ GED	63%
Family Size	
one or two children	62%
three or more children	38%
Child's Gender	53% female
Child's Age (in months)	mean=52 (s.d.=5.2)

Table 2
Bivariate Log Odds for Independent Variables in Predicting Current Use of Formal Care (n=182)

Independent Variables	Log Odds	
Fixed Variables		
Age of mother	.99	
Age of child (in months)	1.04	#
sex (1=girl)	.95	
Birth Weight of Child	1.52	
Family Housing Circumstances		
Live in Public or Subsidized Housing	1.67	#
Number of Children	.58	**
Parent living in home	.42	+
Number of moves	1.27	#
Mother's Human Capital		
Math score	1.01	
Literacy	1.01	**
Attainment of Degree	1.88	**
Years on AFDC	.61	*
Worked previously (mos.)	1.04	**
In school or training previously (mos.)	1.18	***
Mother's Psychological Wellbeing		
Depression	.81	
Number of difficult life circumstances	1.06	
Amount of social support	1.01	
Internal locus of control	1.64	#
Home Environment		
Cognitive stimulation in the home	1.36	***
Emotional support in the home	1.46	**
Current Employment		
Currently working	10.49	***

$p \leq .25$ + $p \leq .10$ * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

Table 3. Logistic Regression Coefficients: Contribution of Background Characteristics, Household Structure, Mother's Human Capital, Mother's Psychological Well-being, Home Environment and Employment to Odds of Using Formal Child Care among the Control Group (n=182)

	Odds					
Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control Variables						
Age of child	1.05	1.07*	1.08*	1.08*	1.08*	1.07^{+}
Gender of child	.96	.83	.87	.88	.68	.77
Household Structure						
Live in Public or Subsidized Housing	-	1.85	2.52*	2.52*	2.69*	3.09*
Number of children	-	.58**	.67	.67	.59^{+}	.68
Parent living in home	-	.48	.57	.56	.68	.74
Number of moves	-	1.37	1.27	1.26	1.47	1.34
Mother's Human Capital						
Literacy	-	-	1.01	1.01	1.00	1.01
Attainment of Degree	-	-	1.17	1.18	.98	1.05
Years on AFDC	-	-	.98	.99	1.13	1.00
Worked previously (mos.)	-	-	1.02	1.02	1.02	.99
In school or training previously (mos.)	-	-	1.15*	1.15*	1.16**	1.16*
Mother's Psychological Well-being						
Internal locus of control	-	-	-	1.07	.70	.75
Home Environment						
Cognitive stimulation in home	-	-	-	-	1.37**	1.32*
Emotional support in home	-	-	-	-	1.50**	1.59**
Current Employment						
Currently working	-	-	-	-	-	11.73***
X^2 (d.f.)	2.54 (2)	15.14**(4)	21.30*** (5)	.03 (1)	18.73*** (2)	15.48*** (1)
-2 log likelihood	230.23	215.10	193.79	193.76	175.03	159.55

$^{+}p\leq.10$ $^{*}p\leq.05$ $^{**}p\leq.01$ $^{***}p\leq.001$

Table 4. Regression Analysis Predicting Children's Scores on the Preschool Inventory (n=182)

Independent Variable	B	SE B	ß
Age of Child	.46	.07	.40***
Gender of Child	.87	.75	.07
Lives in Public or Subsidized Housing	-1.78	.80	-.14*
Months in Training	.05	.09	.04
Cognitive Stimulation in home	.55	.20	.18**
Emotional support in home	.28	.30	.06
Currently working	-.60	1.12	-.04
Currently in child care	3.28	.89	.28***

+p≤.10 *p≤.05 **p≤.01 ***p≤.001

Note. R^2 = .36 (p ≤ .001)

Table 5. Regression Analysis Predicting Children's Scores on the Personal Maturity Scale (n=182)

Variable	B	SE B	ß
Age of Child	-.007	.02	-.02
Gender of Child	-.06	.23	-.02
Lives in Public or Subsidized Housing	-.64	.25	-.20**
Months in Training	.0002	.03	.0006
Cognitive Stimulation in home	.09	.06	.12
Emotional support in home	.19	.09	.17*
Currently working	-.009	.34	-.002
Currently in child care	.06	.28	.02

+p≤.10 *p≤.05 **p≤.01 ***p≤.001

Note. $R^2 = .09$ ($p \leq .05$).