

가족소득 및 인종에 따른 영아 보육 선택
Associations of Family Income and Ethnicity with
Parents' Selection of Infant Care

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<Abstract>

In present study, using longitudinal data of 161 families from Durham Child and Development Study, we examine the characteristics of infant child care chosen by families of different income levels and ethnicity in the U.S. Time-related changes in child care selection for the first year of the child's life were also investigated. Infants from high-income families were more likely to be cared for by someone other than the mother, compared to infant from lower-income families. African-American families were more likely to use non-maternal care for their infant compared to European-American families. Although the effects of income on type of care were not significant, descriptively, more low-income families used relative care while high-income families used more formal arrangements such as daycare center. Infants from low-income families began care earlier and low-income families paid less for care than other families. The findings call for attention to the importance of child care policy for low-income families as well as further research examining the function of cultural differences in selection of infant child care.

본 연구는 미국 North Carolina의 Durham Child and Development Study에 참여하는 161 가족의 자료를 이용하여 소득 수준과 인종에 따라 가족들이 선택하는 영아 보육의 특성을 밝혀보고자 하였다. 생후 1년 동안의 영아

보육 선택에 있어 시간에 따른 변화 또한 분석하였다. 소득이 높은 가족들은 더 낮은 소득의 가족들과 비교하였을 때 어머니가 아닌 다른 사람에 의한 영아 보육을 더 많이 이용하였다. 흑인 가족들은 백인 가족에 비해 영아 보육을 더 많이 이용하였다. 저소득 가족은 친척에 의한 보육을 많이 사용하였고, 고소득의 가족은 데이케어 센터와 같은 보다 형식적인 보육에 의존하는 경향이 보였으나, 소득이 보육의 형태에 미치는 영향은 통계적으로 유의하지 않았다. 저소득층 가족은 영아 보육을 더 이른 시기에 시작하였으며, 유의하게 적은 보육 비용을 지출하였다. 이러한 본 연구 결과들은 저소득층을 위한 영아보육 정책의 중요성과 더불어 영아를 위한 보육 선택에 있어 문화적 차이의 역할을 재조명하였다고 볼 수 있다.

주제어(Key Words): 영아 보육(Infant child care), 보육 선택(Child care selection), 가족 소득(Family income), 인종(Ethnicity)

I. Introduction

The past a couple of decades have witnessed the family's rising propensity to use some forms of non-maternal child care accompanied by increasing labor force participation of mothers of young children. The most dramatic increase was found in the proportion of labor force participants of mothers with infants. According to the reports using data from the 1984-1985 and the 1996 panels of the Census Bureau's Survey of Income and Program Participation (SIPP), only 14% of mothers of newborns who had their first baby from 1961 to 1965 were working by the time the child was 6 months old, increasing to 17% by the child's age of 12 months (O'Connell, 1990). Between 1981 and 1985, 48% new mothers were working 6 months after childbirth, increasing to 56% by the twelfth month. By 1991-1994, this proportion had risen to 52% by the sixth month and 60% by the twelfth month (Smith, Downs & O'Connell 2001). Today in Korea, about 25% of children of the age under 5 are in non-maternal care and 32% of these children are younger than age 1 (Korea Ministry of Gender Equality and Family, 2005).

Various family factors have been found to influence child care selection characteristics, such as the type of child care selected, the child's age at entry to child care, the amount of child care used, and child care cost. Understanding the factors that may affect a family's child care choices is of great importance given that these selection characteristics, especially those for infant child care, are now well-known to be significant predictors of development of children in their later lives (e.g., Helburn *et al.*, 1995; Lamb, 1998; NICHD ECCRN, 1999; NICHD

ECCRN, 2001; Vandell, 2004). In other words, the effects of non-maternal child care cannot be fully explained without understanding why and how families choose child care given that a selection bias may exist due to pre-existing family characteristics influencing child care use characteristics (Liang, Fuller, & Singer, 2000; NICHD ECCRN, 1997; Pungello & Kurtz-Costes, 1999). Especially, it is important to understand the effect of family's economy resources (i.e., family income) and cultural background (i.e., ethnicity), since understanding the role of these factors in families' decision on child care would help establishing public policy on infant child care for families with different socioeconomic status as well as various beliefs and attitudes. Unfortunately, in Korean literature, little is known about the relations between familial factors and parents' selection of child care for their infants.

In this paper, two family background factors that may be associated with the family's decisions concerning child care for their infants are investigated: income and ethnicity. Examining the unique effects of income and ethnicity is often difficult due to the fact that these two variables are typically confounded in samples studied in the United States. In most studies using diverse samples, African Americans have been more likely to be of lower SES than other racial groups (McLoyd, 1998; McLoyd & Ceballo, 1998; Skiba *et al.*, 2005). In this study, we examined the associations between child care selection characteristics and ethnicity and income using longitudinal data from The Durham Child Health and Development (DCHD) Study. This Study provided a unique context for this investigation due to the fact that both African-American and European-American families

with varying levels of income were recruited to participate, thus reducing the typical confound that exists between income and ethnicity. Specifically, we examined how families with infants differed in their use of non-maternal care, the type of care selected, infant's age at first enrollment to care, the amount of care used, and child care cost, depending on their family income and ethnic status.

Use of non-maternal care

First, family income may be associated with a mother's decision to use or not use non-maternal care. Independently of a mother's preference to go back to work early and put her infant in non-maternal care or to stay home and take care of her child by herself, economic necessity appears to affect whether a family uses non-maternal care (see review by Pungello & Kurtz-Costes, 1999). In families with low income, especially in the families headed by a single mother, a mother may need to work to bring in income for the family. Previous findings suggest mothers' perceptions of their need to work for the income is associated with their returning to work soon after the birth of their first child. Mothers who reported that they must work for the income were more likely to use non-parental care (versus parental care only) and were more likely to be employed than women who stated they did not need to work for the income (Pungello & Kurtz-Costes, 2000; Volling & Belsky, 1993).

Type of care

Because desirable types of child care are not always affordable and accessible, the type of care a family decides to use appears to be associated with human resources of the family, especially with family economy (Cappizzano, Adams, & Sonenstein, 2000). For example, using data of 971 mothers with children under the age of 6 in the National Longitudinal of Youth, Hofferth and Wissoker (1992) found that higher family income was related to a higher probability of choosing center care over other types of non-maternal care such as father care, relative care or sitter care. In general, parents with a higher level of household income are more likely to use center-based care than relative or home-based care. Adults with high income may be more likely to have

stable and full-time jobs with regular schedules, which increase the likelihood of using reliable and structured child care, especially center care.

However, the results of some studies suggest a non-linear relationship between family income and formality of child care (center care being the most formal type and relative or father care being the most informal type of child care). In a rather restricted sample of mothers, the majority of whom were married, well-educated, and middle to upper income, Erdwins and Buffardi (1994) found that higher income was associated with an increased likelihood of selecting au pair care (usually the more costly option), but income did not differentiate center and family day care users. On the other hand, families with very low incomes tend to choose center care more frequently than other forms of care (Fuller, Holloway, & Liang, 1995). Hofferth and the colleague (1994) suggested that the rate of center use may be curvilinear: high for low-income families receiving child care subsidies and for affluent households, but lower for working-class families.

The NICHD Early Child Care Research Network (1997) also found that economic factors were most consistently associated with the amount and the nature of the non-maternal care that infants received. With family characteristics including ethnicity, child's gender, and number of children in family accounted for, families using in-home care had the highest incomes. Families using care with an unrelated in-home caregiver (i.e., nanny) had average non-maternal incomes that were on average \$20,000 a year higher than families using any other type of care (NICHD ECCRN, 1997). Although the findings are not always consistent, collectively, the prior work implies that families with the highest level of income tend to use in-home care by non-relative, families with very low family income receiving subsidies (via Head Start, subsidized slots in independent centers, and vouchers) have a high propensity to enroll their child in a center-based care, and beyond that, higher income be associated with more regulated forms of care (center-based care or family day care home).

Compared to European American families, previous findings report that African American families use relative care more and center care less (Hofferth &

Wissoker, 1992; Liang, *et al.*, 2000; Mulligan, Brinhall, West, & Chapman, 2005). When income is controlled, however, African-American families are at least as likely to use center-based care (Fuller, Holloway, & Liang, 1996; Hofferth, West, & Henke, 1994; Huston, Chang, & Gennetian, 2002). Fuller *et al.* (1996) found that within the families with very low-income (i.e. earning below 10,000 dollars), African-American and Hispanic were more likely to select center-based program compared to European-American, whereas selection of child care center was lower for these minority families with low to middle income relative to European-American families in this income group. Liang *et al.* (2000) suggested that parents' likelihood of enrolling their youngster in a center have drawn heavily from the household-economics tradition, emphasizing the influence of cost and family income.

The pattern of ethnic differences appears to vary depending on child's age group (Early & Burchinal, 2001, Mulligan, *et al.*, 2005). According to a study using data from National Household Education Surveys Program (NHES), African-American infants are more likely than European-American infants to receive care from a relative (31 vs. 18 percent), while European-American infants are more likely than Hispanic infants to receive care from a non-relative (17 vs. 7 percent). On the other hand, African-American toddlers are more likely than European-American or Hispanic toddlers to be cared for by a relative (31 percent vs. 20 and 22 percent, respectively) or to receive center-based care (30 percent vs. 21 and 9 percent, respectively) (Mulligan, *et al.*, 2005).

Age at entry

Child's age when non-maternal care begins also appears to be related to family income, specifically the family's economic dependence on maternal earnings. The NICHD ECCRN study (1997) found that the families of infants who entered care between ages 3 and 5 months had the highest family incomes. Five groups were compared based on age of entry into non-maternal care: 0 - 2 months old, 3 - 5 months old, 6 - 11 months old, 12 - 15 months old, and not in care at 15 months. The families of infants who entered care between ages 3 and 5 months had the highest incomes. Infants who entered care

between 0 - 2 months had families with low non-maternal incomes; these families were more dependent than other families on maternal income. On the other end of the spectrum, children who were not in care by age 15 months came from families with relatively high non-maternal income. The relationship between age of entry to child care and ethnicity has not been established in the literature. Given the typical confound between ethnicity and income, children of minority ethnic status may be more likely to enter care earlier than other children. However, when income is controlled, no ethnic status difference may exist. Work is needed to confirm this proposition.

Hours in care

Inconsistent findings have emerged in studies examining the associations between family income and the amount of child care. Hofferth, *et al.* (1991) found little relation of total family income to the amount of non-maternal care that children received. On the other hand, in the NICHD (1997) study, family income variables were potent predictors of the time infants spent in non-maternal care even after family characteristics variables taken into account. Higher maternal income was associated with more hours of non-maternal care use whereas higher non-maternal income was associated with fewer hours of non-maternal care use. Fuller and his colleagues argued that the relations between family economy and the extent of child care usage is not simply linear since the associations between the two are inevitably related to other factors including child care subsidy, maternal employment and price of child care (Fuller, *et al.*, 1996). The association between the amount of non-maternal care that children experienced and ethnicity may be related to child's age. According to a study completed by NICHD ECCRN (1997), at 6 months, African-American families used more non-maternal care than other families, even controlling for family size, maternal education, income, and work hours. However, by 15 months, African-American children did not receive more care, once mother's work hours were taken into account. Due to the inconsistent findings concerning income, and some work that suggests ethnicity may be associated with hours in care for younger but not older

infants, more work is needed examining the associations among the factors.

Cost of care

Hofferth *et al.* (1991) found that families with lower incomes tended to spend less money on child care compared to those with higher family income. Giannarelli and Barsimantov (2000) reported low-income families spent 217 dollars per month on average whereas higher-income families spent an average of 317 dollars. Given that families with low incomes are more likely to depend on free or low cost child care such as parent care or relative care, and government subsidies are available for these families, this discrepancy was interpreted as smaller than expected. In terms of child care expenses as a percentage of earnings, however, low-earning families that used paid care spent an average of 16 percent of their earnings on child care, compared with only 6 percent for higher-earning families (Giannarelli & Barsimantov, 2000). Since cost is related to type, and prior work suggests both income and ethnicity related to type, we expect both also to be related to cost, but more work needed to investigate the relationship between income/ethnicity and cost of child care.

Research hypotheses

Specifically, we hypothesized that: 1) income and ethnicity will be associated with use of non-maternal care. Families with higher income will be more likely to use non-maternal care compared to families with lower family income. African-American families will be more likely to rely on non-maternal care than European-American families; 2) income and ethnicity will be associated with type of care selected such that very low and high income families will be more likely to use formal types of care (e.g., center care) than middle income families, middle income families will be more likely to use informal types of care (e.g., relative care) than low and high income families, and that within income groups, African-American families will be more likely to use informal settings than European-American families; 3) income will be associated with age at entry with infants from low income families starting care earlier than other infants, and ethnicity will be associated

with hours in care for younger but not older infants; 4) ethnicity, regardless of income will be associated with hours in care, with African-American infants spending more time in child care than European-American infants; and 5) income, regardless of ethnicity, will be associated with cost of care with low-income families spending less on care than other families.

II. Method

Description of study

The Durham Child and Development Study is a large, multi-disciplinary study examining the influences of family processes on development in a sample that reduced the typical confound between ethnic status and income in the United States by recruiting African-American and Euro-American families of low-, middle-, and high SES status. The current report examines child care use in this sample when infants were 3, 6, and 12 months of age. Beginning in July 2002, participants were drawn from a largely suburban community in North Carolina via fliers and postings at birth and parenting classes, as well as through mailings and phone contact inviting participation in a longitudinal study of child health and development. Recruitment continued for 18 months until a total of 206 families agreed to participate. Interviews were conducted by trained research assistants and took place in the family's home at 3 and 6 months and in a lab setting at 12 months.

Analytic variables

Parents were interviewed about their *child care use* when the infants were 3, 6, and 12 months of age. At each time point, parents were asked if their infants were cared for by someone other than their mothers for more than 10 hours a week on a regular basis. If they answered they were using non-maternal care, parents were asked about 1) *type of care arrangement*, 2) *age of the child when he/she began care*, 3) *total hours per week in care*, and 4) *total cost per week*. *Income* and *ethnicity* were assessed at 3 month interview.

In this analysis, *income-to-needs ratio*, which is cash income converted into a measure that expresses a

family's income as a proportion of the official federal poverty line for a family of that size, was used. A family with income exactly at the poverty line, for example, is at 100 percent of poverty and has an income-to-needs ratio of 1.00. In 2004, poverty guideline for family of four was 19,350 dollars (U.S. Department of Health and Human Services, 2005).

Groups

Based on the family's income, three groups were created; high-income (greater than an income-to-needs ratio of 4), middle-income (an income-to-needs ratio between 2 and 4), and low-income (an income-to-needs ratio lower than 2). <Table 1> presents the number of families in each group at each time point. Although 206 families originally entered the study, 45 families either withdrew or did not provide income information when interviewed at the 3 month time point, a further 16 did not participate in the 6 month interview, and an

<Table 1> Sample Size by Income Group at Each Time Point

	High N (%)	Middle N (%)	Low N(%)	TOTAL
3 months	54 (34)	61 (38)	46 (29)	161
6 months	48 (33)	57 (39)	40 (28)	145
12 months	39 (30)	49 (37)	43 (33)	131

additional 14 did not participate in the 12 month interview.

<Table 2> summarizes the characteristics of sample including mother's age and years of education and child's gender at the 3 month time point and mother's employment status and the amount of employment at each epoch. Mothers were 28.7 years old on average, and had 14.8 years of education. In general, as income increased, so did age and years of education. By 12 months, about 64% of mothers were employed and the employment rate was higher for families with higher

<Table 2> Characteristics of sample by income groups: Means and SDs

	High	Middle	Low	TOTAL
Mothers' age (yrs)				
M	31.9	28.7	26.1	28.7
SD	3.8	5.0	5.7	5.5
Mothers' education (yrs)				
M	17.0	15.0	12.9	14.8
SD	1.5	2.1	1.6	2.5
Child is male (%)	45.7	47.5	61.1	51.6
Child's Ethnicity				
European-American (N, %)	24 (52.2)	29 (47.5)	31(57.4)	84 (52.2)
African-American (N, %)	22 (47.8)	32 (52.5)	23 (42.6)	77 (47.8)
Mothers currently employed (%)				
3 months	76.1	47.5	42.6	54.0
6 months	80.0	58.2	42.9	60.8
12 months	74.4	63.3	48.7	63.6
Mothers' hours worked per week (hrs)				
3 months				
M	32.1	32.1	31.1	31.8
SD	14.2	13.9	13.3	13.7
6 months				
M	33.6	31.7	27.5	31.5
SD	13.1	14.2	13.2	13.5
12 months				
M	31.9	33.7	31.1	32.4
SD	13.6	13.1	17.3	14.3

income. Mothers who were working worked about 32 hours per week during the first year of the child's life.

Analysis plan

Analysis involved testing hypothesized associations between income and infant child care choices from 3 months to 12 months. Frequencies and descriptive statistics were obtained and chi-square tests were conducted. Repeated measures ANOVAs were conducted to examine group differences by income group over time in child care choices repeatedly interviewed at 3, 6, and 12 months. When a significant difference was found, post-hoc analysis was conducted using Duncan's Multiple Range Test. Ethnicity was another predictor in the analysis. Interaction effects between income and ethnicity were also tested.

III. Results

Child care use

Frequencies of families who used any kind of non-maternal child care by 12 months of the child's age in three income groups are summarized in <Table 3>. Chi-square statistics were calculated to examine systematic relationships between income groups and use of non-maternal care.

At 3 months, chi-square test yielded significant group difference ($\chi^2 (2) = 8.28, p < .05$). Overall, about 51% of

families in the study were using any kind of non-maternal care when child was as young as 3 months old. At 6 months, 59% of participating families used non-maternal child care. However, no significant relationship between income group and child care use was found at 6 months. The marginally significant group effect emerged again at 12 months $\chi^2 (2) = 4.62, p < .10$. At 12 months, the pattern of frequencies was similar to the pattern at 6 months. Overall, children of 62% of families were in non-maternal care. About 74% of high income families were using any type of non-maternal child care by 12 months. Overtime, usage of child care gradually increased in all three income groups.

Use of non-maternal care was significantly associated with ethnicity at all three measurement points. The proportion of families who were using non-maternal care for their infants appeared higher for African-American families compared to European-American. At 12 months, about 75% of African-American families were using non-maternal care whereas about 48% of children from European-American families were under child care by someone else then their mothers.

For the families who were using some kind of non-maternal child care, type of child care of all the child care settings were asked. <Table 4> summarizes the type of primary child care (i.e., child care where the child spent the greatest number of hours per week) in the three income groups. At 3 months, 63% of families who used any non-maternal care used child care at the child's

<Table 3> Use of non-maternal care at 3, 6, and 12 months by income group and by ethnicity

	Income Groups			Ethnicity		TOTAL
	High N (%)	Middle N (%)	Low N (%)	E-A N (%)	A-A N (%)	
3 months	$\chi^2 (2) = 8.28, p < .05$			$\chi^2 (1) = 5.19, p < .05$		
No child care	15 (32.6)	37 (60.7)	27 (50.0)	45 (58.4)	34 (40.5)	79 (49.1)
Any child care	31 (67.4)	24 (39.3)	27 (50.0)	32 (41.6)	50 (59.5)	82 (50.9)
6 months	$\chi^2 (2) = 3.98, n.s.$			$\chi^2 (1) = 6.78, p < .01$		
No child care	11 (27.5)	26 (45.6)	22 (45.8)	37(51.4)	22(30.1)	59 (40.7)
Any child care	29 (72.5)	31 (54.4)	26 (54.2)	35 (48.6)	51(69.9)	86 (59.3)
12 months	$\chi^2 (2) = 4.62, p < .10$			$\chi^2 (1) = 10.39, p < .01$		
No child care	11(25.6)	23 (46.9)	16 (41.3)	33(52.4)	17(25.0)	50 (38.2)
Any child care	32 (74.4)	26 (53.1)	23 (59.0)	30(47.6)	51(75.0)	81 (61.8)

home by father, relative or non-relative (i.e. babysitter, friends, etc.). In terms of who was taking care of the baby, in high income group, 45% of children who were in non-maternal care were cared by father or other relative, whereas 62.5% in middle income group and 66.6% in low income families relied on the child's father or a relative for infant child care. The proportion of center care use was highest in high income group (29.0%) at 3 months whereas only 18% of low-income families used child care centers. Fewer families in the high-income group used informal care at the child's home at 3

months compared to the families with lower family income.

By 6 months, compared to 3 months ago, the proportion of families who used child care by someone inside the family (i.e., father or relative) decreased to 45.3%. More families with low-income used care by family member (57.7%) than another type of care, whereas about 37.9% of children from high-income families were cared by their father or a relative. Families with high family income used more child care out of the child's home (i.e., family day care and child care center) (58.6%) compared to middle- or low-income families (51.6% and 38.5%, relatively).

<Table 4> Type of child care used at 3, 6, and 12 months by income group

	High N (%)	Middle N (%)	Low N (%)	TOTAL
3 months	$\chi^2 (4) = 4.52, n.s.$			
Father	8(25.8)	8(33.3)	9(33.3)	25(30.5)
Other relative	6(19.4)	7(29.2)	9(33.3)	22(26.8)
Non-relative	1(3.2)	2(8.3)	1(3.7)	4(4.9)
Family day care	7(22.6)	2(8.3)	3(11.1)	12(14.6)
Child care Center	9(29.0)	4(16.7)	5(18.5)	18(22.0)
Other	0(0)	1(4.7)	0(0)	1(1.22)
6 months	$\chi^2 (4) = 2.99, n.s.$			
Father	6(20.7)	5(16.1)	5(19.2)	16(18.6)
Other relative	5(17.2)	8(25.8)	10(38.5)	23(26.7)
Non-relative	1(3.9)	2(6.5)	1(3.5)	4(4.7)
Family day care	9(31.0)	9(29.0)	4(15.4)	22(25.6)
Child care Center	8(27.6)	7(22.6)	6(23.1)	21(24.4)
12 months	$\chi^2 (4) = 8.24, p<.10$			
Father	5(15.6)	4(16.7)	8(36.4)	17(21.8)
Other relative	4(12.5)	5(20.8)	7(31.8)	16(20.5)
Non-relative	2(6.3)	0(0)	0(0)	2(2.6)
Family day care	10(31.3)	8(33.3)	3(13.6)	21(26.9)
Child care Center	11(34.4)	7(29.2)	4(18.2)	22(28.2)

At 12 months, the patterns of the type of infant child care used in different income groups were similar to those from 3 and 6 months. Low-income families (68.2%) used more child care by father or a relative compared to families with higher income (37.5% for middle and 28.1% for high income group).

<Table 5> presents the type of child care used by

<Table 5> Type of child care used at 3, 6, and 12 months by ethnicity

	European-American N (%)	African-American N (%)	TOTAL N (%)
3 months	$\chi^2 (2) = 4.85, p<.10$		
Father	8(25.0)	17(34.0)	25(30.5)
Other relative	7(21.9)	15(30.0)	22(26.8)
Non-relative	2(6.25)	2(4.0)	4(4.88)
Family day care	4(12.5)	8(16.0)	12(14.6)
Child care Center	11(34.4)	7(14.0)	18(22.0)
Other	0(0.0)	1(1.22)	1(1.22)
6 months	$\chi^2 (2) = 4.96, p<.10$		
Father	6(17.1)	10(19.6)	16(18.6)
Other relative	8(22.9)	15(29.4)	23(26.7)
Non-relative	1(2.9)	3(5.9)	4(4.7)
Family day care	7(20.0)	15(29.4)	22(25.6)
Child care Center	13(37.1)	8(15.7)	21(24.4)
12 months	$\chi^2 (2) = .75, n.s.$		
Father	5(17.9)	12(24.0)	17(21.8)
Other relative	6(21.4)	10(20.0)	16(20.5)
Non-relative	2(7.1)	0(0.0)	2(2.6)
Family day care	6(21.4)	15(30.0)	21(26.9)
Child care Center	9(32.1)	13(26.0)	22(28.2)

European-American and African-American families. To examine the functions of income or ethnicity in the parents' decisions on the type of child care for their infants, chi-square tests were conducted, however, no significant findings were yielded. Due to the small sample size in some cells, when chi-square tests were conducted, father care, relative care and non-relative care were combined in one group as personal type of child care compared to family daycare home and child care center. Only marginal relations between type of care and income group at 12 months and between type of child care and ethnicity at 3 and 6 months were found.

Age at entry. Children who were in non-maternal care by the 3 month interview entered the child care when they were about 1.8 months old. Low-income group children started non-maternal care (1.3 months) significantly earlier than high-income group (2.2 months) and middle-income group children (2.0 months) ($F(2, 79) = 5.8, p < .01$). By the 6 months interview, children who were in non-maternal care had started child care around 3.2 months. Children from high-income families entered child care when they were about 2.9 months old, whereas the mean age at entry for the other groups ranged from 3.2 to 3.4 months (<Table 6>). However, the difference was not significantly different. Children who were in non-maternal care by the 12 months interview

entered the child care when they were 4.7 months old in average. By this time, families in the middle-income group started to use child care when the children were about 6 months old, whereas children in the low-income group had started non-maternal child care about 3 months after their birth ($F(3,78) = 3.6, p < .05$).

Hours in care. At 3 months, children who were in non-maternal care spent about 32 hours in some type(s) of child care (<Table 6>). Children from different groups did not differ in the amount of child care that they were receiving at three months. On average, children who were in child care when they were 6 months old spent about 29 hours per week at the child care setting(s). Children from families with high family income spent significantly greater amount of time in child care (34.7 hr/wk) than low income group children (25.4 hr/wk) ($F(2, 83) = 3.3, p < .05$). Hours the child spent in child care setting(s) by 12 months ranged from 31.0 to 35.3 hours per week; significant group difference did not exist in hours in child care at this time point.

Cost. At 3 months, families in the high-income group spent significantly more money on child care (109.5 dollars per week) compared to the other groups with lower income (42.0 dollars/week for middle and 19.6 dollars/week) ($F(2, 78) = 13.3, p < .001$). Consistent with 3 months results, significant group differences in the cost

<Table 6> Means and SDs of Age at Entry, Hours in Care, Group Size and Child Care Cost at 3, 6, and 12 months

	High M (SD)	Middle M (SD)	Low M (SD)	Total M (SD)
3 months				
Age (mo)	2.2 ^a (1.1)	2.0 ^a (1.0)	1.3 ^b (.9)	1.8 (1.1)
Hours (hr)	35.4 (19.1)	25.3 (14.8)	33.3 (32.9)	31.7 (23.7)
Cost (\$)	109.5 ^a (92.4)	42.0 ^b (62.1)	19.6 ^b (36.1)	60.3 (79.2)
6 months				
Age	3.2 (1.6)	3.4 (1.7)	2.9 (2.1)	3.2 (1.8)
Hours	34.7 ^a (11.6)	27.5 ^{ab} (15.4)	25.4 ^b (15.7)	29.3 (14.7)
Cost	115.2 ^a (84.0)	74.0 ^b (68.4)	24.1 ^c (35.0)	72.8 (75.3)
12 months				
Age	4.6 ^{ab} (4.3)	6.2 ^a (3.8)	3.2 ^b (3.3)	4.7 (4.0)
Hours	33.8 (11.8)	31.0 (12.1)	35.3 (16.7)	33.6 (13.4)
Cost	119.3 ^a (80.2)	84.4 ^a (77.6)	27.9 ^b (40.2)	81.5 (78.7)

Notes. Age indicates age at first entry to child care in the child's life; Hours indicates the amount of time the child spend in the child care setting(s) per week; Cost indicates total cost the family spent on child care weekly. Letters by each estimate denote results of Duncan's Multiple Range Tests; estimates with the different letter are significantly different at $p < .05$.

〈Table 7〉 Test of Fixed Effects of Income, Ethnicity and Time

	Income	Ethnicity	Time	Income×Ethnicity	Time×Income	Time×Ethnicity
	F (2, 108)	F (1, 108)	F (2, 108)	F (2, 126)	F(4,108)	F (2,108)
Age	4.01*	.15	20.8**	.21	1.51	2.91
Hours	2.30	4.39*	1.84	.85	1.84	1.18
Cost	21.17***	1.40	4.09*	2.20	1.45	1.44

Note. * $p < .05$ ** $p < .01$ *** $p < .001$.

for child care at 6 months were found ($F(2, 83) = 12.8, p < .001$). High income group spent almost five times more on child care than low income families. At 12 months, significant differences in child care cost were found among the income groups ($F(2.79) = 11.7, p < .001$). High-income families spent 119.3 dollars ($SD=80.1$) on child care per week and middle-income families were paying about 84 dollars per week. Low-income families were paying under 30 dollars per week, which was significant lower than the cost of child care spent by higher income families (<Table 6>).

To examine the longitudinal changes in child care selection in income groups and effect of ethnicity on child care selection, repeated measures analysis of variance was performed using Mixed procedure. <Table 7> presents the results. As for age at entry to the first child care of the child, there was main effect of income ($F(2,108) = 4.0, p < .05$). Overall, children from low income families tended to enter non-maternal care earlier than the children from high- and middle- income group. Time effect was also significant, which was expected since the range of possible age of entry to child care increases over time.

In the analysis to examine the main effects of group and time and the interaction effect of time by group predicting amount of time child spent in child care setting(s) per week yielded significant ethnicity effect (LS mean = 33.4, $SD = 1.8$ for African-American families and LS mean = 27.5, $SD = 2.2$). African-American families used significantly more hours of non-maternal care for their infant children than European-American families. Main effects of income and time point existed in child care cost ($F(2, 108) = 21.2, p < .001, F(2, 108) = 4.1$, respectively). Figure 1 represent the least squares means of cost of child care

for three income group from 3 months to 12 months. Significant interaction effects were not detected in the model.

IV. Discussion

The overall purpose of the current study was to examine the associations between family income and ethnic status and child care selection characteristics during infancy. The specific characteristics examined included use of non-maternal care, care type selected, infant age when care began, hours in care, and cost of care. This study adds to the literature by examining the influences of income and ethnic status on the selection variables in a sample in which the typical confounds between these two family background factors were reduced, thus allowing a clearer examination of the unique affect of each.

The results suggest that both income and ethnic status are related to the use of non-maternal care. By 12 months, 74% of infants from high-income families were cared for by someone other than the mother for more than 10 hours per week, compared to 53% of infants from middle-income families and 59% of infants from low-income families. Also at 12 months, 75% of African-American infants were cared for someone other than their mothers on a regular basis compared to 48% of European-American infants.

Concerning care type selected, no significant associations were found between care type selected and family income and ethnic status in this sample. Descriptively, however, more high-income families selected center care than informal arrangements such as relative care, while more low- and middle-income

families used informal care arrangements than center care. Results for age at entry clearly demonstrated an association with family income while the effect for ethnic status was not significant. By the 12 month interview, the average age at entry for infants for low-income families was about 3 months, while the average age at entry for infants from higher income families was about twice that. Results for hours in care, on the other hand, demonstrated an effect for ethnic status but not for income, with African-American infants spending more time in child care per week than European-American infants. Finally, an association between income and cost of care was found such that high income families paid more for child care than other families. In addition, the results suggested that as infants age over the first year, families pay more for child care.

The results suggest that family income, but not ethnic status, is associated with age at entry and cost of care. Infants from low-income families began care earlier and low-income families paid less for care than other families. Infants from low-income families may begin care earlier due to a greater need in these families for the income generated by maternal employment. Although the effects for maternal and non-maternal family income were not contrasted in this study, the NICHD ECCRN study found that the youngest infants in care were from families with low non-maternal income specifically, implying a greater dependence on maternal income (NICHD ECCRN, 1997). The association between family income and cost is also consistent with prior work (e.g., Giannarelli & Barsimantov, 2000). The discrepancy in the child care expenses between groups might be related to greater reliance on informal child care, which is in many cases provided free such as father care or grandparent care. Although the effects of income on type of care were not significant, descriptively, more low-income families used some kind of relative care while high-income families used more formal arrangements. For example, at 3 months, 67% of low-income families were using father care or other relative care while 51% of high-income families were using family day care or center care. The greater reliance on infant child care by family member might imply greater needs of flexible child care services for families in or near poverty due to the maternal

employment at non-standard working hours and/or schedule as well as the issue of child care expenses. Also, these differences in child care cost might infer differences in the type of child care available for families with different level of financial resources.

In contrast, the results suggest that ethnic status but not family income is associated with hours in care. These findings are consistent with the NICHD ECCRN study that found that at 6 months of age, African-American families used more child care than other families when family income was controlled (NICHD ECCRN, 1997). This result may also be related to differences in care type used. Again, although this factor was not significant in these analyses, descriptively, a larger percentage of African-American families used informal arrangements than European-American families.

Limitations of this study must be considered when interpreting these results. First, the small sample size reduced the power to detect significant relationships. This may have especially played a role in the analyses examining type of care, given the small sample sized for some types of care when examined by income and ethnicity. Second, given that only African-American and European-American families were included, these results do not generalize to other ethnic groups. Third, the issue of different attrition rates in three income groups was not treated in the current study. However, in the future, systemic investigation might be required as the study progresses.

Despite these limitations, however, by reducing the typical confound between ethnicity and income and by examining these associations at different time points during the first year, these results have implications for research examining the effects of child care. Specifically, family background variables, such as income and ethnicity, do appear to be related to child care selection characteristics. These factors must be taken into account when examining the effects of child care on children's outcomes. The findings for ethnic groups might also imply cultural differences in terms of beliefs and attitude about maternal employment and non-maternal care. In some developing countries, for example, Korea, even though a growing number of women participate in the labor force, traditional expectations of maternal care

seem to strongly persist. Such differences in cultural expectation and policy contexts might influence the parents' decision on child care for their infants. Further research is needed examining these associations in other groups with different cultural backgrounds to examine if these relationships vary in other groups as well.

Findings also suggest some policy implications. Low-income families started care earlier and paid less for their child care implying they may be using less reliable care probably with lower quality of caregiving environment. Previous work shows quality may impact high risk families more than other families, therefore resources needed to help these families provide best placements for their children.

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