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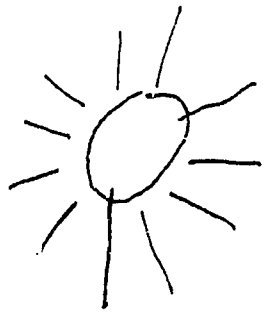
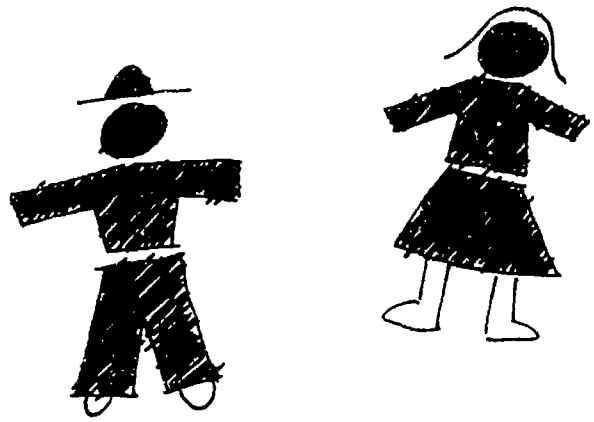
ABSTRACT

This paper reports on the sharp disparities in the supply of preschools across the 100 counties and 36 states included in this study. Three sets of factors help explain these inequities in child-care supply: (1) local patterns of wealth, poverty, and maternal employment; (2) the structure of families; and (3) government subsidy levels. Among the 25 percent most affluent counties surveyed, a preschool class-group is available for every 45 children aged 3 to 5 years. Among the lowest quartile of counties, a class-group is available for every 77 children. Twice as many preschools are available in the Northeast for working-class and poor families than are available in the South. Those counties with the highest population of young, dual-wage, upwardly mobile families have the most abundant supply of preschools. Large urban counties, possessing a relatively large share of families living below the poverty line, attract more child care subsidies per capita from governmental agencies than poor rural counties in the South and Midwest. Two appendixes provide tables of statistical analyses of counties' family size and age structure and the influence of state regulation on child care supply. Contains 51 references. (MDM)





The Unfair Search for Child Care

Working Moms, Poverty, and the Unequal Supply of Preschools Across America

HARVARD UNIVERSITY

THE UNFAIR SEARCH FOR CHILD CARE

Working Moms, Poverty, and the Unequal Supply of Preschools Across America

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THE UNFAIR SEARCH FOR CHILD CARE

Working Moms, Poverty, and the Unequal Supply of Preschools Across America

Summary

Parents' propensity to place their children in formal child-care centers and preschools has climbed dramatically over the past four decades. In 1950, just 14% of all mothers with children under age 6 were in the labor force; in 1990, this proportion stood at 58%. Among families with working mothers, in 1965, 62% relied on spouses or kin members to care for their young children; in 1990, just 47% did so. The resulting growth in formal child-care centers has been phenomenal: rising from 13,600 licensed centers or preschools, to about 80,000 nationwide in 1990. Nationwide over 4 million children currently attend a preschool at least part-time.*

This burgeoning growth in the supply of preschools has enabled millions of mothers to enter the workforce. But has expanding availability of child-care spaces benefitted all types of families and communities equally? This is the first major question that motivates our study. And where preschool supply lags behind -- and we detail sharp disparities across the 100 local counties studied -- what forces explain this sharp inequality in supply? This is the second issue addressed by this report.

Political debate over this rapid spread of preschool organizations often focuses on Government's alleged capacity to spur the "bureaucratization of child rearing" -- the claim that by supporting formal preschools, the state will erode traditional family obligations. But other independent forces may parallel, and eclipse, action by Government: Local economic demands and mothers' rising workforce participation (economic explanations), family social organization and mothers' own priorities (rational-choice theory), and the underlying growth of public schooling (institutional isomorphism) also may help to explain wide variability in the local supply of preschools.

* This study includes child-care centers that primarily serve children age 5 or younger. We use the terms *preschool* and *child-care center* synonymously, since the historical distinction of educational versus custodial care has blurred considerably. We do report on the causes of variation in preschools' internal formalization.

Unequal Access to Preschools

First, this paper reports on sharp disparities in the supply of preschools across the 100 counties and 36 states included in the study -- and those features of counties that suffer from low availability:

- Access to these 80,000 preschools is distributed unfairly across the states *and* among local communities within many states. Supply of, and access to, these centers vary dramatically between rich and poor counties: Among the 25% most affluent counties included in the survey, a preschool class-group is available for every 45 children, age 3-5 years (36-60 months old). Yet among the lowest quartile of counties, a class-group is available only for every 77 children. The lowest levels of preschool supply per capita appear in working-class and rural areas of the South and Midwest.

- Overall regional disparities are remarkable: Twice as many preschools are available in the Northeast for working-class and poor families, relative to those living in the South. Even in states where overall supply of child care is high, access is sharply lower in poorer areas and rural communities.

- The availability of centers and preschools is mainly driven by what we call, "the yuppy supply effect," meaning that those counties heavily populated by young parents earning high wages benefit from the most abundant supply of preschools. Families in affluent urban counties of the Northeast, for example, have access to 50% more preschools per capita than parents residing in low-income counties.

- The influence of female labor participation on the growth of preschools (after taking into account a county's level of wealth) is minimal. This confirms earlier research showing that even when affluent mothers stay home and out of the full-time workforce, they often enroll their young children in a center or preschool at least part-time.

- Large urban counties, possessing a relatively large share of families living below the poverty line, attract more child-care subsidies from Government. This, in turn, raises the supply of preschools within poor innercity neighborhoods. Yet poverty rates remain even higher in many rural counties of the Midwest and South -- areas which benefit neither from the "yuppy supply effect" nor from government subsidies. This helps to explain why these communities suffer from low levels of child-care supply.

■ Changes in the now-diverse structure of the American family also shape these wide disparities in demand for, and supply of, preschools. Counties with low numbers of child-care centers per capita are more heavily populated by traditional families, characterized by having more young children, especially offspring under age 5. These families have lower rates of female employment and rely more on kin members for child care. In addition, variation in the average divorce rate among local communities, which is *not* correlated with county wealth, also leads to a greater supply of preschools. Communities with higher divorce rates tend to have lower quality preschools, as the number of children per teacher rises.

■ The supply of child-care centers per capita is *not* lower in states with more intense regulation of quality, a claim often made by opponents of government support. Overall we found no evidence to support the argument that government activism has distorted supply. Opponents of increased child-care spending also claim that public subsidies artificially raise supply, spurring the erosion of traditional family structures. Besides the positive supply effect of subsidies within innercities, any broader influence of Government is modest. Variation in supply across the 100 counties studied was explained largely by demands emanating from more affluent, two-parent families, not from government subsidy levels. And parents residing in counties with higher school attainment levels express the strongest demand for preschooling and formal child care.

What Forces Drive Unequal Growth in Preschool Supply?

Second, we report on three sets of factors that help to explain these local inequities in child-care supply: the relative influence of (a) local patterns of wealth, poverty, and maternal employment; (b) the structure of families -- be they affluent or impoverished, urban or rural; and (c) Government subsidy levels. We also examined whether these same factors influence the size and internal organization of the 2,087 preschools surveyed within the 100 counties. Many causal factors vary together; so our statistical analysis aims to isolate the strongest independent forces that explain variation in supply -- and to see where public policies may make a difference.

Economic forces hold strong effects on preschool supply. Again, we find that child-care supply is markedly higher within healthy local economies, where better-paying jobs are more plentiful and family income is higher. Additionally local variation in family structure helps to explain variability in child-care supply: local counties with larger families and a younger age structure have fewer child-care centers; areas with higher divorce rates have higher supply. Additional effects from Government action are limited.

Family structures, which differ greatly across different parts of the country and among local areas, also influence the *internal organization* of preschools: Within counties possessing higher divorce rates (and thus higher demand), preschools have more child class-groups and more children per staff member, after taking into account economic factors. Government regulation of child:staff ratios and center subsidies moderate this effect. Counties with higher subsidies tend to possess smaller preschools with more beneficial (lower) child:teacher ratios. Preschools appear to become larger and more "bureaucratic" when the supply of preschools lags behind rising parental demand.

Our analysis is based on data from 100 randomly selected county groups. The survey was conducted by Mathematica Policy Research, based in Princeton, and funded by the U.S. departments of education and health and human services.

Practitioner and Research Audiences

This report is aimed primarily at fellow researchers and policy analysts. We have enclosed additional graphics to ease interpretation of key findings, particularly those pertaining to the supply of preschools across different types of local counties.

INTRODUCTION

The school's influence as a major location of child socialization, directly rivaling the family, represents a remarkable institutional shift over the past century (Durkheim 1956; Tonnies 1957; Meyer 1977). One might interpret the explosive growth of formal child-care centers as the most recent manifestation of public schooling's historical rise and the ongoing rationalization of childhood.[1] In 1950, just 14% of all mothers with children under age 6 were in the labor force; in 1990, this proportion stood at 58%. Among families with working mothers, in 1965, 62% relied on spouses or kin members to care for their young children; in 1990, just 47% did so. Resulting growth in formal child-care centers has been phenomenal: rising from 13,600 licensed centers or preschools, to about 80,000 nationwide in 1990 (Hofferth 1989; Willer et al. 1991).[2]

Sharp civic debate has ensued over whether the current supply of preschools and child-care centers is sufficient -- and whether escalating Government support will erode traditional family structures. This paper first addresses the issue: *How equitably is the supply of preschools distributed across local communities?* Underlying this debate is a major empirical issue: *What forces have caused this rapid expansion of preschool organizations?* This is the second issue addressed in this report. Efforts to address child-care supply, its overall adequacy and its distribution, should be informed by evidence regarding the explanatory forces that may drive wide variability in supply across local areas.

The corresponding rise in maternal workforce participation is an obvious explanation for the rapid growth in preschool supply. But does female employment in specific job sectors lead to gains in local child-care supply? For example, labor demand in professional and technical jobs, benefitting upper middle-class mothers, may lead to growth in unsubsidized child-care centers. Whereas, mothers in lower-income families may respond to greater job demand in less-skilled service and manufacturing sectors. This structural segmentation of maternal labor demands may reinforce social-class inequality in terms of which families have access to quality preschools (Wrigley 1989).

Second, political debate has centered on whether Government -- by subsidizing supply and regulating child care -- is responding to an exogenous rise in family demand, or is instead providing incentives for greater demand, thereby eroding the traditional family. Explicitly referring to active state explanations, contradictory effects are claimed by political conservatives. From Richard Nixon onward, the Right has argued that child-care subsidies will artificially spur demand for non-kin forms (Mondale 1974; Steiner 1981; Sununu 1990).[3] But opponents of stronger central regulation of child-care also argue that such intrusions into the mixed market of providers will constrain supply, lowering competitive pressures and thereby depressing quality (Samuelson 1986; Gormley 1990).

Third, variation in local preschool supply may emanate from (aggregated) differences in families' own economic and social organization. Communities with a higher proportion of single-parent families, for instance, may enter the child-care sector at a higher rate. In addition, the present financing structure of preschooling includes subsidies targeted on low-income families which may drive growth in supply. More traditional communities, especially counties in the South and the rural Midwest, appear to rely less on formal child-care organizations (Kisker et al. 1991).

Fourth, institutional theorists argue that the rationalization of childhood represents a broader social movement, now simply seeping down to formalize the socialization of younger and younger children, with the state simply following parents' deepening commitment to participate in rationalized labor and social sectors and to ready their children for membership in modern organizations (O'Connor 1988; Meyer 1977, 1992). Under this model we would expect that child-care supply would be greater in local communities with more highly rationalized school systems and bureaucratized social sectors.

Organization of the paper. We examine the relative efficacy of these four competing models in explaining variation in the supply and internal organization of formal child-care centers among 100 county groups located in 36 states. Unlike public schooling, the panoply of preschool organizations operating in the United States represents a far-from-institutionalized social sector: boundaries of the institutional field are very hazy, organizational forms are tremendously diverse and hold uneven levels of legitimacy, a normative structure (regarding objectives and mediating technologies) is absent, central government agencies and professional organizations exercise weak influence in the field (Scott 1987; DiMaggio and Powell 1991). Thus local variation in preschool supply may be shaped by a variety of economic, family-structure, and Government forces.

We begin by delineating testable hypotheses and reviewing extant evidence on each of these frameworks, drawing primarily on school expansion and rational-choice literatures. We then report on county-level effects of these alternative factors, based on a 1990 national survey of child-care centers.[4] We discuss the implications of our empirical findings, particularly how variable local contexts condition the state's discrete influence on the formalization of early childhood.

WHAT FACTORS DRIVE CHILD-CARE SUPPLY? WEIGHING ALTERNATIVE EXPLANATIONS

The Influence of Local Economies, Labor Demand, and Female Workforce Participation

The rising share of mothers working outside the home is a commonly cited explanation for the growth of formal child care. The decision to enter the labor force, part-time or full-

time, holds obvious implications for child-care demand. Among working mothers with children, age 3-4 years, 63% reported using formal child care in 1990, that is, not relying solely upon the spouse or kin members. About two-thirds of these mothers used a child-care center.[5] Importantly, among women not working outside the home with children, age 3-4, 25% also placed their child in a center or family day-care home for at least part of each week (Hofferth et al. 1991). Imperfect correspondence between maternal employment and local levels of demand for formal centers is further caused by the preference of some parents for less formal family day-care homes or for a babysitter within one's own home.[6] Other parents, especially those receiving AFDC, often would prefer to place their young child in a formal center if supply and cost constraints were relaxed.[7] But given the limited capacity of Government and other collective agencies (e.g., churches, firms, parent co-ops) to ease supply and cost constraints, rising maternal employment does not automatically lead to growth in the number of preschool organizations.

The mother's type of employment may influence demand for formal child care. Several studies, utilizing household-level data, have shown that mothers working full-time and those with higher wage levels tend to choose a formal center or private babysitter, compared to mothers working part-time and earning less (Duncan and Hill 1975; Hofferth and Wissoker 1991). The opportunity cost of staying home with one's young children is certainly greater for women who are able to enter higher-paying jobs. The direct cost of child care as a share of household income varies across social classes: for families earning $15,000 or less annually and with a child under age 5 years, 23% of all household expenditures goes for child care, versus just 6% for families earning over $50,000 (Hofferth et al. 1991).

The supply of formal centers is highly segmented: many low-income families rely on subsidized centers for at least part of each week, especially single-parent mothers (Coelen et al. 1979; Whitebook et al. 1989). About half of all licensed child-care centers receive some public subsidy; one-fourth receive more than 80% of their revenues from government subventions, either via vouchers to parents or direct payments to the child-care organization (Kisker et al. 1991). This clearly reduces the private cost-constraint for many low-income families. Overall, however, the supply of formal child-care organizations may be driven upward more sharply by the size and purchasing power of affluent and middle-class families: these groups rely on kin members less and preschools more, compared to low-income groups (Hofferth 1992).[8] The supply of child-care centers may be spurred by two independent processes: demand expressed by more affluent families who can afford to pay fees and demand given economic force by government subventions which flow into counties with larger shares of impoverished households.

Empirical work on the historical spread of public schooling points to three mechanisms through which labor demands may influence family demand at the preschool level. First, family-demand effects may vary depending on the relative strength of different labor sectors. Parental demand for education, in general, may be weaker within local economies that show strong labor demand in low-skilled service and manufacturing sectors, for example. Since entry to these jobs is easy relative to professional and technical occupations, the opportunity

cost of further schooling is high. Parallel findings show that the strength of white-collar job markets is positively related to sustained family demand for schooling (Rubinson 1986; Walters and O'Connell 1988). Parents' occupational position and class affiliation, in turn, often operates on their conceptions of child development, normative parenting practices, and preferences for organized preschooling (Kohn et al. 1990; Goodnow and Collins 1990; Astone and McLanahan 1991).

Second, the family's own economic and social organization mediates structural labor demands (Horan and Hargis 1991). The propensity of some families, for instance, to have more children mitigates against the mother entering the labor force, regardless of the availability of job opportunities. For impoverished single-mothers, the opportunity cost of entering the workforce and seeking formal child care may be too high. Yet, in the child-care sector, this interacts with Government action, since once low-income mothers seek welfare or child-care benefits they must also search for work or training (under workfare requirements). In short, particular family structures may be more or less responsive to variability in labor demands emanating from a structural level.

Third, when cost and supply constraints diminish, and the legitimacy of certain forms of schooling rises, expressed family demand climbs and, over time, these organizational forms become deeply institutionalized, independent of subsequent variability in labor demands (Rubinson and Ralph 1984; Garnier et al. 1989). Parental demand for preschooling and full-day kindergartens among upper middle-class parents, for instance, may stem from the now institutionalized belief that they offer more educational and stimulating settings for young children (Hofferth et al. 1991; O'Connor 1990). Similarly, one recent national survey of parents with young children found that twice as many low-income mothers reported using a "Head Start center" than was possible, given the actual number of Head Start preschools. This over reporting is probably due to the highly legitimated acceptance of this type of preschool within impoverished communities (West et al. 1992). Thus we would expect to see weaker labor-demand effects on subsidized centers, where cost constraints are less and institutional credibility is higher (at least in low-income communities with a longer history of subsidized preschooling). And where certain family structures, such as single-parent households, lead to demand for child-care and eligibility for subsidies, variability in local labor structures should be less influential.

Three hypotheses stem from the structural labor-demand model:

H_1 Local counties with higher rates of female labor-force participation show higher levels of child-care supply [since overall family demand is greater].

H_2 Wealthier counties with stronger labor demand for skilled professional and technical workers are associated with higher child-care supply [since the opportunity cost of staying home is greater for mothers and the private cost-constraint is lower].[9]

H_3 The influence of labor demand and female workforce participation is less on the supply of Government-subsidized preschools [since state action in low-income communities, over time, has been lowering the private cost-constraint and legitimating formal preschooling].

The Influence of Government Action

In the United States, early education and child care has long involved a mixed market of organizations, financed both through parental fees and via subsidies from disparate government agencies, school districts, churches, community organizations, and firms. While many preschools operate solely on the basis of parental fees, little doubt exists that Government exercises significant influence on supply within certain segments of this mixed market. The federal government alone, by 1990, provided $8.5 billion in child-care subsidies, directly to centers and via tax benefits to parents (Barnett 1992). In 1992, the federal child-care tax credit provided about $4.0 billion in annual benefits, and the new federal block-grant program provides almost $1 billion yearly in parental vouchers. Appropriations to Head Start currently equal $2.8 billion annually. State governments spend another $1.5 billion in organizational and family (voucher) subsidies. One important question: Are these various actions by Government related to overall child-care supply across local counties, or are supply effects specific to a particular segment of the preschool "market"?

Advances in the broader study of educational expansion help to delineate mechanisms through which Government action may spur supply. The preschool sector represents a ripe new area for similar research on the effects of active states -- one with a distinctly different institutional character and political dynamics relative to public schooling. In the child-care arena, Government aims to operate directly on both supply and on the internal organization of child-care centers (e.g., child:staff ratios) via subsidies, incentives, and regulation. Three different forms of state action, observed in the school expansion field, may influence supply and internal organization.

First, the overall size and activity of Government across local counties may be associated with greater supply and more convergent forms of preschool organization. While a rather blunt and under-specified mechanism, more active central states and local governments do tend to spark greater school supply and stronger expressed demand for education (Garnier et al. 1989; Fuller and Rubinson 1992). Even under relatively weak central regimes, such as in the United States, school enrollments rose more rapidly when state-level governments exercised higher expenditures (Walters and O'Connell 1988). And schooling initially took on more bureaucratic forms (e.g., formal grade levels, large and consolidated administrations) within urban locales where municipal governments were more active in responding to diverse civic demands (Meyer et al. 1979; Rubinson 1986).

Second, and of direct relevance to the preschool sector, local supply effects from state activity may operate through a resource-dependence mechanism. Growing Government subsidies for child care (emanating from Washington or state and local governments) have undoubtably sparked greater supply of child-care centers, especially among the 25% of all centers nationally which receive more than 80% of their budget from subventions. These subsidies also move through lower-income families who qualify for child-care benefits under AFDC, employment programs, vouchers earmarked for child-care, Head Start slots, and tax benefits via the child-care and earned-income tax credits (for review, see Hayes et al. 1990).

Third, Government may influence the supply of educational organizations through less material institutional mechanisms. State governments can variably charter the school institution, in terms of its legitimacy, inclusiveness with regard to ethnic and gender groups previously on the periphery, and linkages to the formal structure of status and the occupational hierarchy (Meyer 1977, 1992). Over time, neo-institutionalists would expect to see "modern" forms of child care and early socialization converging organizationally with the already rationalized system of mass schooling (O'Connor 1988). More highly educated parents would invest in formal preschooling to prepare their children for real schooling, thereby advancing their status interests. Indeed, more highly educated parents rely more on formal child-care than do less educated parents.[10] From an institutional perspective, local areas with a more extensive public schooling system, and greater rationalization of public life in general, should exhibit a more isomorphic and rationalized form of preschooling.[11] It is in these counties that the mixed market of child-care organizations should be further down the path of sector formation: exhibiting convergent forms of organized services, more dense networks of related organizations, more active regulation and rule-setting by the state, and broader consensus over professional norms (Scott and Meyer 1983; Meyer et al. 1988; DiMaggio and Powell 1991).

Little empirical work specifically in the child-care field has occurred on how different forms of government action influence supply. Political debate centers on whether action by Government, primarily subsidy levels, are simply following exogenously driven gains in family demand. Or do rising subsidies create a priori incentives for families to rely less on spouses and kin, and more on formalized settings (Grubb and Lazerson 1988; Rector 1988)? Two recent studies have shown that wages of child-care workers have remained constant in real terms since the late 1970s, suggesting that rapidly rising public subsidies have gone mostly for gains in supply or in reducing child:staff ratios (Kisker et al. 1991; Blau 1992). With regard to government effects on the internal organization of child-care centers, claims have been made that more intense regulation of quality by state governments will raise private costs and drive many organizations out of the market. This assumes that regulations actually influence internal organizational features, a related area that has received little empirical attention.

Four additional hypotheses -- stemming from these material and institutional actions of Government -- can be formulated:

H_{4A} Counties with larger and more active government agencies display higher levels of child-care supply.

H_{4B} Counties populated by parents with higher educational levels and by more rationalized social service organizations display higher levels of child-care supply.

H_5 Counties populated with more families that are eligible for government subsidies display higher supply.

H_6 Where state-level governments regulate child-care more intensively, supply will be less, after controlling for subsidy levels.

H_7 Counties with stronger family demand for child care will display centers that are larger in size and hold more formalized roles for teachers, after taking into account the center-level influence of subsidies.

Thus far, each hypothesis has focused on processes that occur at the county level. Note, however, that H_6 and H_7 make claims about processes that cross over two organizational levels. We return to how these two-level models are specified.

The Influence of Family Structure

Demand for formal child-care arrangments, of course, operates through the family. Rational-choice theorists go further to argue that demand originates from within the family, although the a priori formation of "preferences" is usually left unspecified or is linked to broader institutional processes (Becker 1981; Coleman 1990). In the present study, we do not directly observe variation in the behavior of individual families. Consistent with our principal level of analysis -- understanding variability in supply among local counties -- two basic arguments from rational-choice theory can be applied by aggregating family characteristics to the county level. Findings linked to these hypotheses, however, should be interpreted cautiously so as not to fall victim to an ecological fallacy.

First, rational-choice views of the family emphasize that as the labor of children yields lower returns, as in more urban settings, parents choose to have fewer children. This shift away from quantity and toward the quality of child rearing implies a proportionally higher allocation of family resources to formal schooling (Becker 1981; Schultz 1990). Work on the family's social organization does show that parents with more children simply allocate less time to each child, for example, in supervising school work. This pattern is particularly

acute for single parents (Astone and McLanahan 1991; Downey 1992). Parents with fewer children also rely more heavily on formal centers: 32% of all parents with one child rely on a center; whereas, just 18% of all parents with three or more children are using centers (Hofferth et al. 1991).

Second, the family's available resources, social support, and normative behaviors likely condition whether parents enter and place demands on the market of formal child-care providers. For example, poor single parents have fewer monetary resources or, if they are working, less time to behave as versatile market actors (Astone and McLanahan 1991; Hofferth 1992). It is therefore not surprising that low-income parents overall rely more heavily on their spouse, if present, and kin members to care for their children, expressing fewer demands within the formal preschool market. In contrast, more affluent divorced parents may exercise greater demand for formal centers. It also appears that Latino families use formal child-care centers less frequently than other ethnic groups (West et al. 1992). Notwithstanding these variable preferences, many low-income families qualify for child-care subsidies, which presumably leads to greater expression of demands on, and gains in the supply of, formal child-care organizations.

Family structure, when aggregated to the county level, may be related to the supply of formal centers in the following ways:

H_8 Counties with a younger age structure and larger households display a lower supply of child-care centers [since a greater proportion of parents hold traditional parental preference and thus demand for formal centers is lower].

H_9 Counties with more impoverished and/or single-parent families have a greater supply of child-care centers [since subsidy flows to these families, or the need for formal centers among affluent divorced parents, will stimulate higher supply].

MODELS AND EMPIRICAL ANALYSIS

Next we describe how empirical models were constructed to assess the validity of these competing explanations of local variation in supply or internal organization. The labor-structure and family-structure models relate to levels of demand exercised by households; we first operationalize these two sets of claims. Then we turn to facets of the active-state model which speaks to the direct provision of child-care supply, as well as state-spurred institutional factors which may raise parental preferences and demand for preschooling.

Simple OLS models of child-care supply. In estimating the supply of child-care centers, among the 100 county groups, we begin by specifying three basic models. First, we estimate

the influence of county labor structure and female workforce participation on the number of centers per capita and the number of class groups specifically available for children, age 3-5 years of age, with a single-level OLS model:

$$Y_s = f\,(\,\beta_0 + \beta_1 I + \beta_{2..4} LD_{a..c} + \beta_{5..7} MP_{d..f} + r\,) \qquad [1]$$

Where the numbers of centers and child class-groups per capita is a function of mean family income per capita, labor-demand characteristics of the county, and female participation rates by job sector. Three job sectors ($LD_{a..c}$) were included separately in the model: the share of all workers employed in (a) managerial, professional, or technical positions, (b) semi-skilled sales, clerical, and service occupations, and (c) manufacturing and assembly jobs.[12] The share of workers who are female for each sector also was included ($MP_{d..f}$). Occupational data for all counties are from the 1990 census (Bureau of the Census 1993). County-level household income data are for 1985-1988 (Bureau of the Census 1988).

Second, we estimate supply effects from variability in family structure aggregates among counties, as a second source of demand, controlling for the prior influence of family income and labor demands:

$$Y_s = f\,(\beta_0+\beta_1 I+\beta_{1..3} LD_{a..c}+\beta_{4..6} MP_{d..f}+\beta_7 FS+\beta_8 SP+\beta_9 D+\beta_{10} L+r) \qquad [2]$$

Where supply effects are estimated for (county averages of) family size and age structure [FS], share of households headed by a single and/or an African American parent [SP], the divorce rate [D], and percentage of households in the county with Latino parents [L]. The first two predictors are composite measures, based on a principal components analysis. The first [FS] combines z-scores for two discrete county-level measures: the average number of persons residing in each household and the percentage of all county residents who are under 5 years of age. These two variables were correlated at $r=.68$. The second composite predictor [SP] combines the county's share of all households that are headed by a single parent and the percentage that are African-American, correlated at $r=.87$. All family structure variables are from the 1985-1988 period and calculated from raw data appearing in the Bureau of the Census (1988).

Third, we estimate supply effects from various state actions:

$$Y_s = f\,(\,\beta_0 + \beta_{1..3} GS_{a..c} + \beta_{4..5} SB_{d..e} + \beta_{6..9} RT_{f..i} + r\,) \qquad [3]$$

Where supply effects are estimated from three measures of government size [GS, percentage of the county workforce employed by government agencies, total taxes payed per capita, and total inter-governmental tranfers]; two indicators of child-care subsidy levels, linked to the resource-dependence argument [SB, average share of center budgets coming from government subsidies and percentage of households below the poverty line, drawing greater

inflows of federal and state subsidies into counties]; four measures of public sector rationalization, linked to the institutional isomorphism explanation [RT, average school attainment of the county's adult residents, percentage of all school-aged children and adolescents enrolled in school, number of hospital beds per capita, and number of nursing-home beds per capita]. All measures come from the Bureau of the Census (1988), with these exceptions: Government employment data are for 1990 (Bureau of the Census 1993); and share of child-care center budgets from government subsidies are for 1989-90 (Kisker et al. 1991).

Estimates of dependent child-care supply indicators. Actual numbers of licensed and other known child-care centers for 100 county groups were collected by Mathematica Policy Research in preparing for the 1989-90 nationwide sample survey (detailed in Kisker et al. 1991).[13] For this paper we excluded centers that exclusively serve children, age 5 years or older, that is, those providing only after-school care. Our first measure of child-care center supply is simply the number of centers available in the county per 1,000 children, age 60 months or younger. The second measure is an estimate of subsidized centers per capita. This estimate is based on the share of all centers found to be subsidized via Head Start, public schools, or other agencies, utilizing the sample survey data. Third, we estimated the number of child class-groups available per 1,000 children within the county, rather than the number of preschool organizations. Fourth, to focus more specifically on the supply for young children, age 3-5 years of age, we estimated the number class-groups available for this specific age cohort. Importantly, counties with fewer subsidized child-care organizations tend to have a larger number of class-groups withn each center ($r=-.26$). We return to the independent role of largely private demand for child care vis-à-vis the tendency of lower-income counties to have more class-groups concentrated in fewer, more heavily subsidized centers.[14]

Multilevel (HLM) Model for Estimating Center Formalization. Various claims are made within the civic debate over formalized child care about whether Government intervention will further bureaucratize the structure of preschool settings. We did find in an earlier paper that (excluding Head Start) centers with higher subsidy levels are more formalized in terms of being larger (more child class-groups), having a more structured curricula for young children, more credentialled and specified roles for teachers, and higher salaries (Fuller et al. 1993). On the other hand, Government subsidy levels are associated with lower child:staff ratios, a critical variable empirically related to positive child-development outcomes.

In the present paper, we push forward on this issue by testing whether county-level demand and other state actions may influence three dimensions of internal formalization: (a) center size in terms of the number of child class-groups, (b_1) the ratio of children:teacher and (b_2) a similar ratio, using all adult classroom staff as the denominator, and (c) the degree to which teacher roles are formalized. The latter dependent variable was dropped due to lack of any findings from county-level determinants. Since we are principally interested in determinants emanating from the county level (Level 2), but we already know that subsidy

flows moving through individual preschools (Level 1) operate on internal formalization, a two-level hierarchical linear model (HLM) is required (Mason et al. 1983; Bryk and Raudenbush 1992). The general HLM model at Level 1:

$$Y_{ij} = \beta_{0j} + \beta_{1j} (X_{ij} - \bar{X}_{.j}) + r_{ij} \qquad [4A]$$

Where the formalization of center i in county j is a function of the grand mean, plus the subsidy level within center i minus the mean subsidy level for all centers in county j, weighted by a coefficient, β_1, the value of which can vary over j counties. That is, the influence of center-level subsidies on formalization is conditioned by county-level characteristics.[15] Therefore,

$$\beta_{0j} = \gamma_{00} + \gamma_{0j} C_1 \ldots C_z + u_{0j} \qquad [4B]$$

Where the grand mean is a function of mean formalization levels among the 100 counties, plus the influence of the substantive county-level labor, family demand, and state-action predictors. HLM allows us to estimate the γ_{0j}'s without distorting estimated error terms, which normally occurs when using OLS with nested data. Similarly:

$$\beta_{1j} = \gamma_{10} + \gamma_{1j} C_1 \ldots C_z + u_{1j} \qquad [4C]$$

Where the slopes representing the Level-1 relationship between center-level subsidies and our formalization measures are a function of the mean slope across all counties and variation in Level-1 slopes attributable to variability in county (Level 2) predictors. In sum, our county-level predictors can influence mean levels of internal informalization and condition the magnitude of the known influence of center-level subsidies on greater formalization.

OLS estimation of state-policy effects. Finally, we asked whether state-government regulation and subsidy levels influence mean levels of center supply and internal formalization for those counties drawn randomly within each state, controlling for average family-income levels. The county sample included between 1 and 12 counties in each of 36 states, an insufficient number of Level-1 units within each state for an HLM analysis. Therefore, a simple OLS model was constructed. State-government policies included as predictors included intensity of child-care regulation (Adams 1990) and aggregate subsidies for preschooling (National Governors Association 1989). Findings should be considered tentative, given the degrees of freedom constraint.

National sample of counties and child-care centers. To survey a random sample of child-care centers, Mathematica Policy Research, under contract with the U.S. departments of health and human services and education, first drew a stratified random sample of counties or county groups (in the case of sparsely populated counties). These are the 100 primary sampling units which fell within 36 states. Within each county, complete lists of licensed and otherwise known preschooling organizations was constructed. From these universe listings, centers were randomly chosen, and then weighted to achieve representativeness

among major types of centers operating in each county. A total of 2,089 phone surveys with center directors were conducted (details of the sampling design appear in Kisker et al. 1991, Volume 2).[16]

The stratification procedure for the 100-county sample ensured that major urban counties were included in the sampling frame. Thus distributions for some variables proved to be skewed; log transformations in most cases brought the distributions into acceptable levels. In estimating supply effects from government actions, we removed seven large urban counties with outlying values for government employment and intergovernmental transfers. We report model estimations based on unweighted observations for counties, since we are not interested in nation-level estimates. All final models, however, also were run weighting county cases by child population, excluding the four largest urban counties (e.g., New York City). No significant differences were observed in the weighted least-squares models relative to the unweighted OLS results.

FINDINGS

Local Variation in Child-Care Supply

How does variability in center supply covary with economic and social characteristics of the 100 county-groups? First, we ranked the counties by their mean family-income levels and simply calculated the average number of child-care centers per 1,000 children for the 10 counties closest to the 25th, and the 10 closest to the 75th, percentile. This procedure was repeated to determine the average number of class-groups serving children, age 3-5 years (36-60 months). In Figure 1, we illustrate the slightly higher level of supply for counties resting closest to the 75th percentile in terms of family income. This latter set averages 4.8 centers and 16.9 class-groups per 1,000 children, compared to 4.4 centers and 15.6 class-groups in the lower-income counties.[17] The mean family income of a county, of course, masks variation in household-level income and poverty levels.

Second, we ranked counties by their mean family size and similarly calculated average supply levels proximate to the 25th and 75th percentiles of these particular rankings. Counties with lower family size have 6.2 centers and 20.5 class-groups per 1,000 children, compared to only 4.9 centers and 15.8 class-groups in counties with higher average family size. Third, we ranked counties by the share of center budgets that come from government subsidies of any kind. Counties with lower subsidies possess 5.5 centers and 19.6 class-groups per 1,000 children, compared to 6.2 centers and 20.2 class-groups in more highly-subsidized counties.

Table 1 provides more detailed descriptive statistics for our dependent supply indicators and for economic, family-structure, and Government-action predictors. For this table we split counties into those 25 falling below the 25th, and those falling above the 75th,

percentile. At these ends of the county-income distribution, we see sharper covariation with child-care supply. For example, the highest-income counties have 6.1 centers and 41.1 class-groups per 1,000 children, on average versus 50 centers and 29.3 class-groups in the lowest-income counties. In terms of internal organization, high-income counties tend to have centers with more class-groups (4.4 versus 3.4) but lower child:adult staff ratios (8.2 versus 8.9).

Urban-rural disparities in supply. Regional and urban-rural inequities in supply underlie differences associated with county income and family structure. Among urban counties located in the South, for instance, 22 class-groups are available for every 1,000 children, versus just 14 class-groups in rural southern counties. These means compare to 27 class-groups in urban counties of the Northeast, versus 21 class-groups in more rural counties in the same region. Table 1 shows that low-income counties tend to have a smaller share of professional, technical, and government jobs, higher female workforce participation, younger and larger family structures, a greater share of African-American families and households below the poverty line, and much lower levels of taxation. Only slight differences are observed in the divorce rate.

Explaining Local Variation in Child-Care Supply

We begin by focusing on the possible influence of demand forces -- overall economic wealth, labor demand by job sector, and demands that may emanate from the family's social structure.

Effects of economic and labor demand. Measures of county wealth and labor structure, of course, are colinear in some cases. Thus in Table 2 we report three specifications which compare possible center-supply effects from overall county wealth, labor demand, and female workforce participation. Looking at equations 1A and 2A, we see that mean family income at the county level is significantly related to the supply of centers but not to the specific supply of subsidized centers. The same pattern appears for the percentage of jobs in professional and technical fields (Eqs. 1B and 2B). This is not surprising, given the colinearity between county income and this particular labor-force predictor ($r=.74$). Female workforce participation in the manufacturing sector is significantly related to the supply of centers, but not to the supply of subsidized centers (Eqs. 1C and 2C).[18] Overall, these economic-demand factors fail to explain variation in the supply of subsidized centers.

Similar estimations are made in Table 3 for our second pair of supply indicators: the supply of child class-groups per 1,000 children. Here mean family income, professional-technical jobs, and female participation in manufacturing jobs are significantly related both to the supply of all class groups and those enrolling children, age 3-5 years.

Effects of family structure. In Table 4 we report on additional supply effects from inter-county variability in family organization. To control on prior effects from mean family

income, and given its colinearity with the family-size composite (r=-.51; wealthier counties are populated by smaller families with a lower share of young children), we specify models which include and exclude the former.[19] Family income, as expected, does substitute somewhat for the family-size predictor. However, this index of average family size and a (younger) age structure is strongly and negatively related to child-care supply. That is, counties with more traditional families -- more young children and more people residing in the home -- have fewer centers and class-groups. In addition, and orthogonal to the family-size effect, counties with higher divorce rates have more centers and class-groups overall, but not necessarily more subsidized centers. In general, these family-structure models yield more consistent results and higher r^2 values, compared to the economic and labor-demand equations.

Effects from Government action and institutional isomorphism. Table 5 reports on the possible influence of government actions, linked to active-state, resource-dependence, and isomorphism theories. Counties with a greater share of government employment do have a greater supply of child class-groups, but not centers. Subsidy levels are related to overall supply of centers. This suggests that Government resources have indeed helped to raise supply in general, rather than supporting higher teacher salaries or improvements in quality (consistent with Blau 1992). Average school attainment also is related to overall supply of centers and class-groups, but not to the supply of subsidized centers or to class-groups for 3-5 year-olds. Overall, Government actions and institutional features of counties are related to child-care supply, more consistently with regard to the number of class-groups serving children, age 3-5.

Parsimonious models. To assess the relative influence of economic factors, family structure, and Government actions, we constructed reduced models which combined significant predictors. In Tables 6 and 7 alternative equations are specified to determine the consistency of predictors when colinear variables are included or excluded in separate models, (particularly more professional labor structures and school-attainment levels.[20] For each of our four dependent supply indicators we first entered significant and non-colinear predictors from the earlier models: female participation in manufacturing jobs, family size, divorce rate, and child-care subsidy levels.[21] This is the specification in Eq.1, Table 6. The overall supply of centers per capita is related to female workforce participation, negatively to the family size and age-structure composite, positively to the divorce rate, and positively to the share of center budgets coming from subsidies. In Eq.2 we then enter the professional workforce predictor into the model. This predictor is highly significant and substitutes slightly for the family-structure composite, lowering the beta coefficient. A similar effect is seen in Eq.3 when the parent's school attainment variable is entered rather than the professional workforce predictor. Similar models for subsidized centers, excluding the government-subsidy predictor as before, yield weaker results.

In Table 7, these alternative specifications are studied for the class-group indicators of supply. These results are quite similar to Table 6, with two important exceptions. The professional workforce and parental education predictors more consistently substitute for the

effects of family structure; yet the independent effect from family stucture remains highly significant. The effect of the divorce rate continues to be independent of other predictors. Second, the influence of center subsidies on the number of class-groups is inconsistent. Subsidies hold no significant influence on the overall number of class-groups (Eqs. 1-3). For class-groups serving children, age 3-5, subsidies hold not relationship until the professional-workforce or parental attainment variables are entered.

Which family structures yield supply effects? The consistently negative association between the family structure composite and child-care supply prompts the question of what family structures are driving this effect. Since we are assessing supply differences across county aggregates, we can not thoroughly illuminate the underlying mechanism. But we can disentangle whether the effect stems from wealthier urban counties populated by smaller families with older children, or more from rural counties with traditional family structures, larger families with a greater share of young children.[22] We split the county sample between those above the median number of persons per household and those below. Then, two of the reduced models were run for each subgroup of counties, estimating total supply of centers and class-groups. Results appear in Appendix 1. The family-size composite turns out to be stronger in counties below the median on family size, although significant in all but the estimation of overall center supply in counties above the median. In addition, the divorce rate is statistically significant and the coefficients are much larger in the predominantly urban counties, those resting below the median.

Importantly, none of the supply indicators are significantly correlated with the percentage of county residents who are below the poverty line or with the share of households headed by a single mother. While impoverished families do draw child-care subsidies into the county, boosting the supply of class-groups (Table 7), smaller affluent families seem to be pushing supply upward more sharply.

Explaining Variation in the Formalization of Child-Care Centers

Do these same factors influence the internal organization of child-care centers? We estimated the influence of economic demands, family structure, and Government action on three facets of center formalization: size in terms of the number of child class-groups, the ratio of children per adult staff member, and the degree to which the teacher's role is formalized.[23] Mentioned above, we earlier found that Government subsidy levels, moving through individual centers (Level 1), are associated with more groups of children but lower child:staff ratios and more formalized teacher roles (Fuller et al. 1993). To investigate the independent effects of county-level forces (Level 2), given this prior evidence on Level-1 effects, a hierarchical linear model (HLM) was constructed (Bryk and Raudenoush 1992).

Estimation of baseline HLM models determines the shares of total variance linked to within-county vis-à-vis between-county variation. Much more variability in the internal organization of child-care centers exists within counties: 91% of the total variance in the

number of child class-groups, and 95% of the variability in the child:staff ratio, is explained by between-center differences within counties. On the other hand, significant variation does exist among counties in absolute terms (see Table 1). Table 8 reports final HLM estimations of center size (number of class-groups) among the 86 counties (Level 2) for which complete data were available and sufficient to reliably estimate slopes within counties. The slopes represent the center-level influence of subsidies on the number of class-groups (Level 1). The final model is specified to include the mean family-income predictor (Eq.1), then to exclude it (Eq.2). In both specifications the county divorce rate is positively related to the number of class-groups. In Eq.2 the marginally significant γ_{12} suggests that the negative influence of center subsidies on the number of class-groups is more strongly negative in counties with greater numbrs of professional and technical jobs. That is, subsidies may help to lower the size of centers when the county economy is richer with better paying jobs. The divorce rate (which, remember, moves independently of county wealth) also is related to higher ratios of child:adult staff (Table 9). Counties with higher divorce rates, and presumably greater demand for child care, have centers with more class-groups and more children per adult staff member. Demand also drives this staffing ratio upward in another way: Eq.1 (γ_{11}) shows that the generally negative slopes between center subsidies and the child:staff ratio are flatter in counties with higher family income. That is, the influence of subsidies in keeping down the staffing ratio is weaker in counties with stronger parental demand linked to higher income.

Does State-Government Regulation Influence Formalization or Supply?

The internal organization of centers also may be influenced by a contextual set of forces operating from above the county level, namely regulation by state government. Indeed regulation aims to control key elements of formalization, such as the maximum number of children that can be enrolled, or the maximum ratio of children:adult staff, within each class group. These presumably controllable facets of internal organization have been empirically linked to positive child-development outcomes (for review, Hayes et al. 1990). State-level regressions were run to assess whether regulatory intensity and state-government subsidies are related to internal organizational features. Findings are reported in Table 10.

States with more intense regulation tend to have smaller centers with fewer class groups, after controlling on the (positive) effect of the state's mean family income (Eqs. 2 and 3). These states also appear to have centers with lower child:staff ratios. However, the first regulatory predictor (whether the state sets a maximum child:staff ratio for groups serving 4 year-olds) substitutes for the prior effect of mean family income, comparing Eq.4 with Eq.5. This reflects the reality that wealthier urban states tend to regulate more intensively; it is difficult to find urban states with weak regulation or rural states with strong regulation (Adams 1990). Similar models were run to estimate supply effects. We could find no evidence that supply was lower in states with more intense regulation. The only model that yielded a significant F-value and adjusted r^2 was one that showed a positive relationship between regulation and state-government subsidies with the supply of subsidized centers (see

Appendix 2).

DISCUSSION: POLICY IMPLICATIONS

To summarize our empirical findings, we return to the initial hypotheses. Local economic context clearly is related to the overall supply of child-care centers. Counties more rich in high-paying professional and technical jobs have significantly greater supply. The rate at which women participate in lower-skilled manufacturing jobs (which varies independently of county wealth) also is positively related to child-care supply. These effects, as hypothesized, are less consistent for the supply of subsidized centers, although complete data are available for a fewer number of counties.

The final models also show that certain forms of Government action remain related to supply, after controlling for prior effects of economic demands. First, parents' level of school attainment is positively related to supply, and it substitutes somewhat for the effects of family structure. Second, child-care subsidies exert a rather inconsistent influence on supply, with the clearest effect observed on the supply of class-groups for children age 3-5.

The strongest and most consistent effects stem from variability in aggregated family structure. Counties with smaller families and a lower share of young children, on average, have significantly higher child-care supply. And independent of this family-size effect, counties with higher rates of divorce also have greater supply. These effects remain robust after controlling for the influence of county wealth, poverty levels, and ethnic composition.

Family structure conditions Government action and supply effects. Two parallel processes are operating to advance the formalization of early childhood. The first process might be termed, "the yuppie supply effect." Counties with higher levels of preschool supply are populated more heavily by well-educated parents who are employed in professional and technical jobs; they express strong demand for, and have sufficient resources to support, a larger number of organizations via fees. In tandem, these same urban counties have large numbers of small impoverished families who draw child-care subsidies, via parental vouchers or direct subventions to their preschool organizations. In contrast, families in less affluent counties, especially in working-class and rural areas, have larger families with a greater share of young children. But these more traditional families have neither the resources, nor perhaps the social preference, to express strong demand for formal child care. The divorce-rate effect is interesting in that it operates independently of these processes to boost the supply of child care.

Additional research is required at neighborhood and family levels to see whether these relationships hold. Our findings, however, do show that typical family resources and structures vary substantially across local areas, and that these variations have implications for the growth of formal child-care organizations. Government does appear to influence local

supply -- but in more complex ways than opponents on the political Right currently portray. Again, the major push for supply stems from demand exercised by affluent parents employed in better-paying jobs. Here supply is driven by private forces. Government subsidies targeted on impoverished families -- an interaction of state action and changing family structures -- independently supports greater supply. But note, in both instances shifts in family structure appear to lead; action by the central state, aimed at keeping-up with demand, follows. And these shifts in family structure are occurring within two quite different segments of society: affluent households with small families and mothers active in the workforce, versus impoverished households often headed by a single mother.

Our findings lend some support to institutional theorists' claims that the encroaching formalization of early childhood is a natural extension of the historical rise of mass schooling. Counties with more highly educated parents do exhibit higher levels of preschool supply. But Government operates as an active agent: legitimating formal child care in the eyes of affluent parents and directly subsidizing additional centers within poor communities. The rationalization of women's labor, a latter day element of the "great rationalization project" (Meyer 1977, 1992), certainly influences parental demand. And growing acceptance of formalized child care may spread, in part, as a diffuse social movement. But the discrete agency of the state should not be underestimated. Indeed the strong effects of family structure reveal that formalized preschooling is not yet a widely credible organization, certainly not to the same degree that mass schooling has become. Government action may hurry this slow legitimization process.

Finally, our analysis of preschools' internal formalization suggests that market failure may occur when Government action, lagging behind climbing demand, leads to inadequate local supply. Centers tend to be larger in more urban counties where demand is greater. Where demand is greater, and linked to a higher divorce rate, both the number of class-groups and the number of children per teacher are higher. Similarly, in counties where the number of subsidized centers lags behind, children are concentrated in a fewer number of larger centers. The inability of Government to keep pace with rising demand holds implications for internal formalization and, as with supply, inequities in the quality of preschooling provided.

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Endnotes

1. We use the terms child-care center and preschool synonomously. The earlier distinction of "custodial day care" versus more educational preschools has blurred considerably (Kisker et al. 1991). This paper deals only with formal centers or preschools, including Head Start, centers attached to public schools, church-run, independent non-profit and for-profit centers. We have excluded centers that exclusively serve school-age children (after-school care). Our data set also excludes family day-care homes.

2. The number of licensed family day-care homes falling under state government regulation increased from an estimated 32,700 to 118,000 during the same period. The number of unlicensed family day-care homes exceeded one million in 1990 (Kisker et al. 1991).

3. In 1971, Mr. Nixon vetoed the first national child-care bill (outside of Head Start), declaring: "[It] would commit the vast moral authority of the National Government to the side of communal approaches to child rearing over and against the family-centered approach (Grubb and Lazerson 1988, p.214)." For a review of how alternative policy instruments may influence supply and quality of preschooling, see Stewart (1989).

4. Basic information on the survey's design and descriptive findings appear in Kisker et al. (1991) and Willer et al. (1991).

5. One-third of all children in the U.S., age 3-4 years, are now enrolled in a child-care center at least part-time. Another 20% are in a family day-care home or with non-kin adults (Hofferth et al. 1991, Table 2.3).

6. The share of working mothers who rely on family day-care homes has remained steady at between 20% to 25% since the mid 1970s (Willer et al. 1991).

7. Among parents dissatisfied with their current child-care arrangement, 49% would like to move their child to a center (Willer et al. 1991). Similarly, the majority of mothers receiving AFDC in Illinois expressed a preference for center-based care, even though the child-care subsidy only covered the cost of a family day-care provider (Siegel and Loman 1991).

8. Hofferth (1992, Figure 27) found that 38% of middle-class, and 35% of working-class, families reported using formal centers, compared to just 22% of working-poor and 30% of non-working poor families. Asked about the availability of center-based care, 70% of mothers with household incomes over $50,000 said, yes, a formal preschool was available and affordable; just 49% of mothers with incomes under $15,000 responded affirmatively (Figure 38).

9. Explaining the antecedent rise in maternal workforce participation is well beyond the scope of this paper. Disaggregating components of the labor forces into higher-paying skilled jobs vis-à-vis lower-paying service and manufacturing jobs does help to inform debate over whether mothers must work, given economic exigencies felt by families, or whether rising rates of maternal employment are driven by a desire for self-expression, economic independence, and broader participation in civil society (O'Connor 1988). We are not directly observing such phenomena nor modeling decision-making processes at the household level.

10. Among parents with more than four years of college, and with a child under 5 years of age, 44% use a formal child-care center, compared to 22% of parents who have dropped out of high school (Hofferth et al. 1991, Table 2.15).

11. With less institutional subtlety, public school interest groups also are pushing to control a larger share of Government subsidies going to preschools (e.g. Shanker 1987).

12. Together, these 3 categories comprise 52% of all jobs, on average, at the county level. Occupational categories not included in the labor-structure model: farming, fishing, protective services, transportation, handlers, and all other laborers. These job categories are small proportionally and not easily sorted, based on skills, into our three basic labor categories.

In general, economists warn against modeling supply as a non-recursive outcome resulting from (maternal) labor demand, since demand and supply occur simultaneously under current price conditions. However, we are entering female workforce shares by individual job sector, not in the aggregate. And the relationship between these predictors and our supply indicators is modest. The strongest bivariate relationship is between the share of factory workers and assemblers who are female and the overall supply of child-care centers, $r = .25$. The more consistent influence from professional and technical jobs tends to substitute for this modest female-share relationship in our final models (Tables 6 and 7). It also is dwarfed by effects from family structure. For these reasons, we believe that any simultaneous equation bias is quite minimal.

13. Extraordinary efforts were made, working within each county, to construct a complete list of all formal child-care centers or preschools operating at the time of the study. Listings of known centers were collected from state agencies, municipal "resource and referral agencies," community organizations, school districts, and the federal Head Start administration (see Kisker et al. 1991, Volume 2).

14. The two center-supply measures, all centers and subsidized centers, are correlated ($r = .86$). And the two child class-group measures, all groups and groups just for 3-5 year-olds, are correlated ($r = .92$).

15. Subsidy levels within centers are centered around their county-specific mean to eliminate any error associated with between-county variation (Bryk and Raudenbush 1992).

16. Major types of centers surveyed: Head Start, church-sponsored, public-school sponsored, independent non-profit, and for-profit centers. Response rates ranged from 98% for Head Start center directors to 86% for independent centers.

17. The 10 counties laying closest to the 25th percentile: Stanislaus and San Mateo (California) Madison (Indiana), Macoupin and Montgomery (Illinois), Alamance (North Carolina), Columbia and Clatson (Oregon), Philadelphia and Westmoreland (Pennsylvania), Bexar and Bowie (Texas). The 10 counties resting closest to the 75th percentile: Maricopa (Arizona), Los Angeles, and Ventura (California), De Kalb and Fulton (Georgia), Suffolk (New York), Cuyahoga (Ohio), Bristol (Rhode Island), Harris (Texas), King (Washington).

18. This predictor is not colinear with either mean family income ($r = -.01$) or with share of workforce in professional or technical jobs ($r = .04$).

19. Mean family income is not colinear with the divorce rate ($r = .04$), African-American representation ($r = -.10$), or Latino representation ($r = .35$).

20. A third colinear predictor, the family-income predictor, also was assessed. But these models looked very similar to the Eqs.2 and 5 in Table 6 and Eqs. 2 and 5 in Table 7.

21. A fifth predictor, government employment, was consistently insignificant in the reduced models and was dropped from further analysis. We also investiged the possibility of interaction effects from independent predictors. These interaction effects tended only to substitute for main effects and not add to the proportion of variance explained.

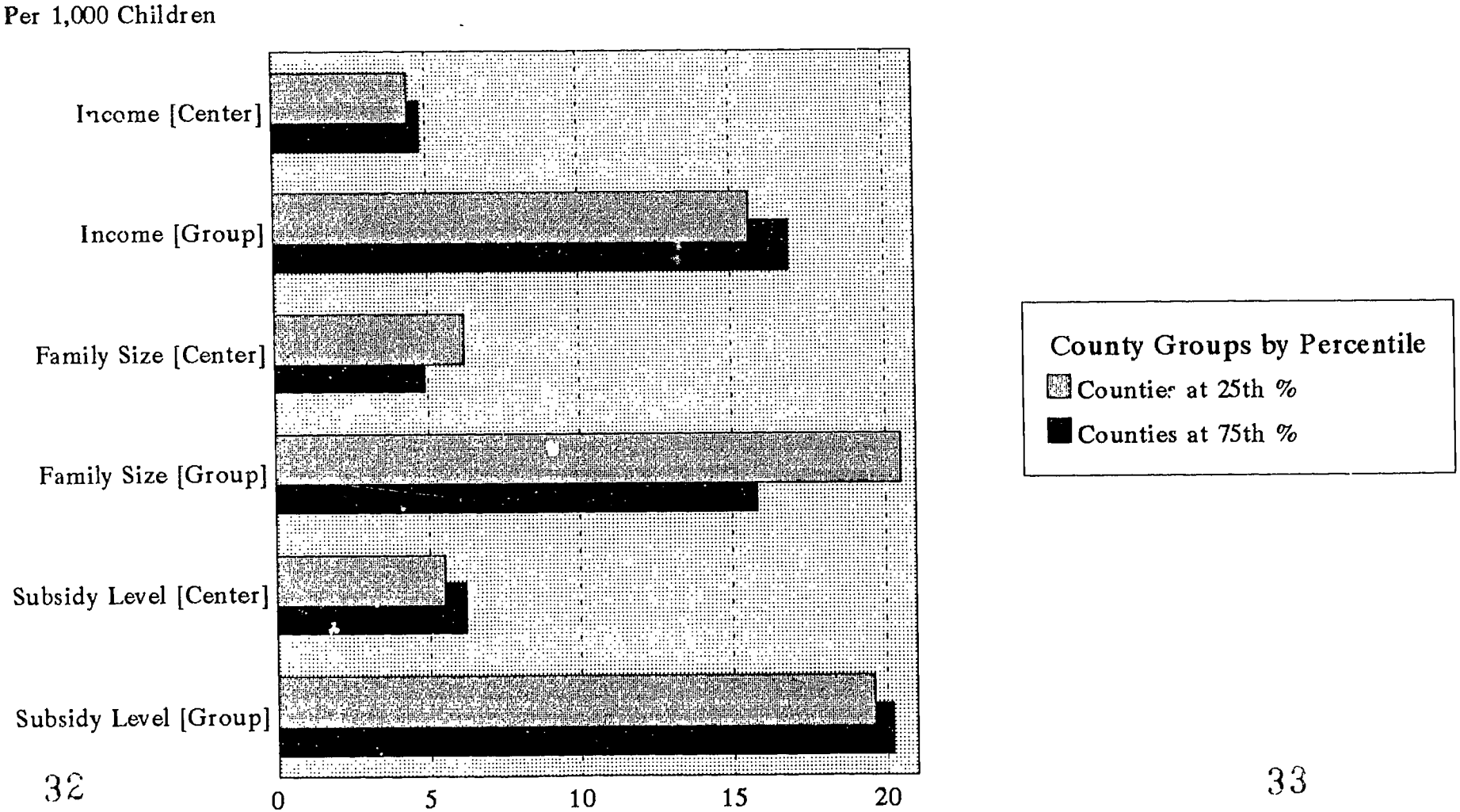
22. The correlation (r) between mean family income and percentage of all children, age 5 or below, equals -.53. The correlation between family income and mean number of persons per household equals -.40.

23. No consistent county-level effects on teacher formalization were observed, so specific models are not reported. Formalization was measured as an index of whether teachers taught from an organized curriculum, had time to plan class activities, and received health and other employment benefits.

Figure 1

Supply of Child-Care by County Characteristics

[counties split by 25th and 75th percentile on income, family size, and subsidy levels]



Note: "Center" refers to number of centers per 1,000 children. "Group" refers to number of child class groups for children, age 3-5 years, per 1,000 children. Family size is a standardized composite of two highly correlated variables: family size and percentage of children under age 5.

Table 1

Descriptive Statistics: Supply of Child Care Centers and Possible Determinants by County Income Level[1]

[n=100 counties, means and SD in parentheses]

	All Counties	Low Income Counties [25th percentile]	High Income Counties [75th percentile]
Supply Indicators[2] [per 1,000 children, age 3-5]			
Child-care centers	5.7 (3.6)	5.0 (1.7)	6.1 (2.8)
Fully subsidized centers	1.8 (1.8)	1.8 (1.1)	1.8 (1.6)
Class groups [all centers, all age groups]	37.5 (24.4)	29.3 (9.9)	41.1 (16.9)
Class groups [all centers, age 3-5 years]	20.7 (14.9)	13.4 (4.1)	22.0 (10.4)
Organizational Form			
Child:teacher ratio, age 3-5 years	12.4 (1.9)	12.0 (1.7)	12.4 (2.4)
Child:adult staff ratio, age 3-5 years	8.5 (1.2)	8.9 (1.2)	8.2 (1.3)
Average number of child groups	4.1 (0.9)	3.4 (0.8)	4.4 (0.9)
Family Income Levels			
Mean family income [$ per capita]	13,156 (3063)	9,565 (1038)	17,318 (2046)
Percentage of households below the poverty line	9.2 (4.8)	13.9 (5.7)	6.6 (3.6)
Labor Structure			
Percentage of workforce employed in professional or technical jobs	20.3 (7.1)	13.8 (4.0)	28.2 (6.2)
Percentage of workforce in semi-skilled sales or service jobs	26.9 (5.5)	22.4 (5.5)	29.9 (3.9)

Table 1 [continued] ...

	All Counties	Low Income Counties [25th percentile]	High Income Counties [75th percentile]
Percentage of workforce in manufacture and assembly	4.8 (2.8)	6.2 (4.0)	3.2 (1.1)
Share of professional and technical jobs held by women	48.8 (3.5)	51.8 (2.8)	45.9 (2.8)
Share of semi-skilled sales and service jobs held by women	65.2 (3.9)	68.2 (3.0)	61.1 (2.8)
Share of manufacture and assembly jobs held by women	38.5 (9.9)	40.7 (13.6)	38.8 (8.1)
Family Structure			
Percentage of all children under 5 years of age	7.4 (1.1)	7.9 (1.0)	6.5 (1.2)
Average number of persons residing in the household	2.6 (0.2)	2.7 (0.1)	2.5 (0.3)
Percentage of households headed by a single mother	10.2 (2.9)	10.6 (3.4)	9.8 (2.5)
Percentage of families, African-American	12.9 (14.1)	16.6 (16.5)	12.7 (14.4)
Percentage of families, Latino	5.8 (9.9)	5.7 (13.4)	7.2 (6.0)
Divorce rate	5.1 (1.65)	5.4 (1.73)	5.4 (1.89)
Government Size and Activity			
Percentage of workforce employed by Government	7.4 (5.7)	6.9 (3.4)	9.0 (10.6)
Total taxes [$ per capita]	427 (244)	235 (121)	609 (349)

Notes

1. Counties are split into quartiles on the basis of aggregate household income per capita in 1988 (Bureau of the Census 1988).

2. The supply-indicator means in column 3 exclude two (high) outlying counties· Arlington, Virginia and New York City. If these counties are excluded from column 1, the four mean values, reading down, equal 5.3 centers, 1.6 subsidized centers, 35.1 class groups, and 19.2 class groups for children, age 3-5 years.

Table 2

Influence of Local Wealth, Poverty, and Labor Demand on the Supply of Child-Care Centers
[n=98 counties, ß and t statistics reported]

	Y Supply Measures [per child]:					
	All Child-Care Centers			Subsidized Child-Care Centers		
	[1A]	[1B]	[1C]	[2A]	[2B]	[2C]
Mean Family Income	.0003 (2.68)**			.00007 (1.14)		
Overall Labor Demand						
Percentage of jobs, profession or technical		.18 (3.65)***			.03 (1.27)	
Percentage of jobs, manufacturing or assembly		.12 (0.93)			.02 (0.36)	
Female Labor Participation						
Share of professional and technical jobs held by women			.01 (0.15)			.10 (1.91)+
Share of manufacturing jobs held by women			.09 (2.51)*			.02 (1.25)
Model						
Intercept	1.63	1.30	1.41	.91	.94	-4.27
F-value	7.20**	6.72**	3.24*	1.30	0.82	3.00+
Adj. r^2	.06	.10	.04	.00	.00	.04

+ p<.06 * p<.05 ** p<.01 *** p<.001

Note: Due to missing data, the sample size for estimating subsidized centers (columns 2A to 2C) equals 88 counties.

Table 3

Influence of Local Wealth, Poverty, and Labor Demand on the Supply of Child Class Groups
[n=98 counties, ß and t statistics reported]

	Y Supply Measures [per child]:					
	Class Groups, All Ages			Class Groups, Children Age 3-5		
	[3A]	[3B]	[3C]	[4A]	[4B]	[4C]
Mean Family Income	.002 (3.49)***			.001 (4.37)***		
Overall Labor Demand						
Percentage of jobs, profession or technical		1.15 (3.33)**			.67 (3.15)**	
Percentage of jobs, manufacturing or assembly		-.06 (-0.07)			-.13 (-0.25)	
Female Labor Participation						
Share of professional and technical jobs held by women			-.39 (-0.05)			-.30 (-0.71)
Share of manufacturing jobs held by women			.58 (2.40)*			.35 (2.41)*
Model						
Intercept	2.90	14.60	34.27	-5.20	7.71	21.61
F-value	12.19***	6.38**	2.94+	19.11***	5.94**	3.01*
Adj. r^2	.10	.10	.04	.15	.09	.04

+ p<.06 * p<.05 ** p<.01 *** p<.001

Table 4

Influence of Wealth, Labor Demand, and Family Structure on Child-Care Supply

[n = 98 counties, ß and t statistics reported]

	Y Supply Measures [per 1,000 children]:							
	Child-care centers All		Subsidized		Child class-groups All		Age 3-5 Years	
	[1A]	[1B]	[2A]	[2B]	[3A]	[3B]	[4A]	[4B]
Mean Family Income	.0001 (0.85)		-.00005 (-0.61)		.001 (1.86)		.001 (2.10)*	
Family Structure								
Family size	-.71 (-3.21)**	-.82 (-4.66)***	-.38 (-3.05)***	-.33 (-3.41)***	-4.21 (-3.00)**	-5.79 (-5.07)***	-2.86 (-3.30)**	-3.96 (-5.59)***
Percentage, single-mother African-American families	.06 (0.35)	.02 (0.17)	.06 (0.65)	.07 (0.78)	1.22 (1.13)	.78 (0.73)	.53 (0.80)	.23 (0.34)
Percentage, Latino families [log]	-.21 (-0.71)	-.09 (-0.34)	-.03 (-0.18)	-.09 (-0.61)	-1.98 (-1.02)	-.22 (-0.13)	-.38 (-0.32)	.83 (0.78)
Divorce rate	.61 (2.76)**	.56 (2.63)**	.17 (1.37)	.18 (1.57)	5.48 (3.86)***	4.77 (3.44)***	2.15 (2.45)*	(1.66 (1.93)+
Model								
Intercept	1.13	2.86	1.65	.93	-10.57	13.45	-5.33	11.43
F-value	6.97***	8.55***	3.48**	4.29**	10.34***	11.74***	9.69***	10.62***
Adj. r^2	.23	.23	.12	.13	.32	.30	.31	.28

Note: Due to missing data, the sample size for estimating subsidized centers (columns 2A and 2B) equals 88 counties.

Table 5

Influence of Government Action on Child-Care Supply
[n = 90 counties, ß and t statistics reported]

	Y Supply Measures [per child]:			
	Child-care centers		Child class-groups	
	All [1]	Subsidized [2]	All [3]	Age 3-5 years [4]
Government Size [active state]				
Percentage of workforce employed by Government	-.59 (-0.52)	.10 (3.59)***	.81 (2.41)*	.50 (3.00)**
Total taxes per capita [log]	-12.4 (-1.90)	-.13 (-.38)	-6.4 (-1.65)	-.20 (-0.10)
Total inter-governmental transfers per capita	-0.01 (-1.33)	.0002 (2.27)*	.0007 (0.57)	.0001 (0.29)
Child-Care Subsidy Levels [resource dependence]				
Average share of centers' budget from Government subsidies [log]	4.97 (2.06)*	--	1.0 (0.65)	1.12 (1.43)
Percentage of households below poverty line [log]	-6.2 (-0.75)	-.14 (-.33)	-8.97 (-1.72)	-5.51 (-2.14)*
Public Sector Rationalization [institutional isomorphism]				
Average school attainment of adults	1.4 (2.70)**	.0003 (0.01)	.71 (2.21)*	.22 (1.42)
Percentage of school-age children enrolled	45.9 (1.25)	.35 (0.24)	20.0 (1.21)	4.50 (0.54)
Number of hospital beds per capita	620.1 (0.48)	-11.6 (-0.30)	612.4 (1.12)	261.1 (0.97)
Number of nursing-home beds per capita [log]	7.2 (1.17)	.57 (1.67)	-4.05 (-0.98)	-1.21 (-0.59)

Table 5 [continued] ...

Model				
Intercept	53.4	-.62	72.92	22.52
F-value	1.86	3.79***	3.27**	4.16***
Adj. r^2	.08	.20	.17	.23

Notes: Seven counties with outlying values were excluded from these models. In addition, the total sample size for the estimation of subsidized centers equals 81 counties, given missing data.

The government-subsidy predictor is excluded in model 2, given its tautological relationship with the number of subsidized centers available within counties.

Table 6

Reduced Model of Child-Care Center Supply:
Effects from Significant Economic Factors, Family Structure, and Government Actions
[n=98 or 88 counties, ß and t statistics reported]

	Y Supply Measures [per child]					
	All Centers			Subsidized Centers		
	[1]	[2]	[3]	[4]	[5]	[6]
Labor Demand						
Percentage of jobs, professional or technical	--	.16 (3.67)***	--	--	.009 (0.35)	--
Share of manufacturing jobs held by women	.07 (2.27)*	.07 (2.33)*	.08 (2.60)*	.02 (1.14)	.02 (1.14)	.02 (1.22)
Family Structure						
Family size	-.70 (-4.02)***	-.54 (-3.17)**	-.40 (-2.07)*	-.31 (-3.21)**	-.31 (-3.02)**	1.27 (-2.40)*
Divorce rate	.61 (3.18)**	.59 (3.27)**	.60 (3.24)**	.17 (1.55)	.16 (1.53)	.16 (1.52)
Government Action						
Parents' school attainment	--	--	.16 (3.10)**	--	--	.02 (0.75)
Child-care subsidy level	.04 (1.55)	.06 (2.78)**	.06 (2.44)*	--	--	--
Model						
Intercept	-.88	-4.5	-4.2	.16	-.02	-.27
F-value	11.16***	12.82***	11.67***	5.92**	4.43**	4.56**
Adj. r^2	.29	.37	.35	.14	.13	.14

*p<.05 **p<.01 ***p<.001

Note: For models 4-6 complete data were available for 88 counties.

Table 7

Reduced Model of Child Class-Group Supply:
Effects from Significant Economic Factors, Family Structure, and Government Actions
[n=98 counties, ß and t statistics reported]

	Y Supply Measures [per child]					
	All Child Class-Groups			Class-Groups, Age 3-5		
	[1]	[2]	[3]	[4]	[5]	[6]
Labor Demand						
Percentage of jobs, professional or technical	--	.91 (3.13)**	--	--	.61 (3.44)***	--
Share of manufacturing jobs held by women	.45 (2.18)*	.44 (2.09)*	.49 (2.52)*	.24 (1.94)	.23 (1.97)	.27 (2.27)*
Family Structure						
Family size	-5.4 (-4.63)***	-4.4 (-3.89)***	-3.3 (-2.61)**	-3.5 (-4.89)***	-2.8 (-4.09)***	-2.2 (-2.80)**
Divorce rate	4.9 (3.93)***	4.8 (4.02)***	4.8 (4.04)***	2.2 (2.81)**	2.1 (2.86)**	2.1 (2.87)**
Government Action						
Parents' school attainment	--	--	1.10 (3.21)**	--	--	.69 (3.26)**
Child-care subsidy level	0.04 (0.23)	.20 (1.27)	.18 (1.15)	.14 (1.46)	.25 (2.60)*	.23 (2.40)*
Model						
Intercept	-5.6	-26.1	-28.2	-2.6	-16.4	-16.7
F-value	13.35***	13.64***	13.81***	12.53***	13.54***	13.17***
Adj. r^2	.33	.39	.39	.32	.39	.38

*p<.05 **p<.01 ***p<.001

Table 8

Influence of Economic Demands and Family Structure on Center Size
[reduced HLM model; γ coefficients and t statistics reported]

	Y Formalization: Number of Child Class-Groups	
	[1]	[2]
FIXED-EFFECTS ESTIMATES		
For Mean Number of Child Class-Groups [Level-1 intercept, β_0, n=86 counties]		
Intercept [γ_{00}]	3.8 (8.70)***	3.8 (12.15)***
Mean family income [γ_{01}]	.03 (0.17)	--
Percentage of workforce in professional or technical jobs [γ_{02}]	.02 (0.78)	.02 (1.32)
Divorce rate [γ_{03}]	.23 (2.33)*	.24 (2.35)*
For Center-Level Government Subsidy Slopes [Level-1 slopes, β_1][1]		
Intercept [γ_{10}]	-.0004 (-0.03)	.006 (0.71)
Mean family income [γ_{11}]	-.003 (-0.80)	--
Percentage of labor force in professional or technical jobs [γ_{12}]	-.0004 (-0.72)	-.0007 (-1.89)+
Divorce rate [γ_{13}]	.002 (0.84)	.002 (0.73)

Continued...

Table 8 [continued]

RANDOM-EFFECTS ESTIMATES [variance components, chi-square and (df)reported]		
Mean number of class-groups, U_0	.51, 189.8*** (82)	.51, 189.4*** (83)
Government subsidy slopes, U_1	.0002, 137.4*** (82)	.0002, 137.8*** (83)
Level-1 random effect, r_{ij}	5.00	5.00

+$p<.06$ * $p<.05$ 1. Centers with incomplete data are excluded; counties are excluded from HLM estimation when insufficient numbers of centers exist to reliably calculate within-county slopes and error terms.

Table 9

Influence of Economic Demands and Family Structure on Child:Staff Ratio
[reduced HLM model; γ coefficients and t statistics reported]

	Y Formalization: Child:Adult Staff Ratio	
	[1]	[2]
FIXED-EFFECTS ESTIMATES		
For Mean Child:Adult Staff Ratio [Level-1 intercept, β_0, n=86 counties]		
Intercept [γ_{00}]	8.6 (15.18)***	9.2 (23.35)***
Mean family income [γ_{01}]	-.26 (-1.20)	--
Percentage of workforce in professional or technical jobs [γ_{02}]	.0009 (0.03)	-.02 (-1.19)
Divorce rate [γ_{03}]	.34 (2.79)**	.35 (2.83)**
Family Size [γ_{04}]	-.05 (-0.67)	-.004 (-0.05)
Percentage of workforce in government jobs [γ_{05}]	-.0003 (-0.63)	-.0005 (-0.93)
For Center-Level Government Subsidy Slopes [Level-1 slopes, β_1]		
Intercept [γ_{10}]	-.0003 (-0.02)	-.02 (-2.06)*
Mean family income [γ_{11}]	.01 (2.13)*	--
Percentage of labor force in professional or technical jobs [γ_{12}]	-.0002 (-0.22)	.0009 (1.56)
Divorce rate [γ_{13}]	-.001 (-0.35)	-.001 (0.71)
Family Size [γ_{14}]	.004 (1.69)	.001 (0.71)
Percentage of workforce in government jobs [γ_{15}]	$.1^{E-5}$ (0.02)	$.5^{E-5}$ (0.33)

Continued...

Table 9 [continued] ...

RANDOM-EFFECTS ESTIMATES [variance components, chi-square and df reported]		
Mean child:adult staff ratio, U_0	.42, 116.9** (80)	.43, 119.6*** (81)
Government subsidy slopes, U_1	.0002, 107.3*** (80)	.0003, 116.9 (81)
Level-1 random effect, r_{ij}	10.21	10.19

* $p < .05$ ** $p < .01$

Table 10

Influence of State Regulation on Child-Care Internal Formalization
[n=35 states, ß and t statistics reported]

	Formalization: Size - Number of Class Groups			Formalization: Child:Adult Ratio, 3-5 yr.old		
	[1]	[2]	[3]	[4]	[5]	[6]
Mean Family Income	.00002	.00006	.00006	-.00007	-.00003	-.00006
	(0.83)	(2.48)*	(2.07)*	(-2.36)*	(-0.97)	(-1.54)
State Regulatory Intensity						
Child:staff ratio for 4 year-old class groups		-.92	-.79		-.88	-.94
		(-3.20)**	(-2.08)*		(-2.18)*	(-1.81)
Maximum group size for 3 year-old class groups			.01			.03
			(0.84)			(0.02)
State Preschool Subsidies			-.12			.003
			(-0.92)			(0.02)
Model						
Intercept	3.4	2.4	2.6	10.7	9.7	10.2
F	0.69	5.57**	2.52+	5.57*	5.47*	3.52*
Adj. r^2	.00	.21	.17	.12	.20	.25

+p<.06 *p<.05 **p<.01

Note: Sample size equals 30 states for models with state-subsidy predictor (Eqs. 3 and 6), due to missing data.

Appendix 1

Reduced Supply Models -- Splitting Counties by Family Size and Age Structure

	Y = Total center supply		Y = Supply all class-groups	
	Smaller/Older Families [n=48]	Larger/Younger Families [n=49]	Smaller/Older Families [n=48]	Larger/Younger Families [n=49]
Female share of manufacturing workforce	.12 (1.70)	.03 (1.30)	.93 (2.00)	.13 (0.88)
Family size/age structure	-1.03 (-2.54)*	-.28 (-1.28)	-6.6 (-2.50)*	-3.1 (-2.13)*
Divorce rate	.80 (2.70)**	.05 (0.25)	6.2 (3.22)**	1.2 (0.94)
Center subsidy level	.09 (2.21)*	-.01 (-0.67)	.46 (1.61)	-.33 (-2.62)*
Model				
Intercept	-5.6	4.00	-42.0	29.4
F value	8.69***	1.02	9.43	3.11*
Adjusted r^2	.39	.00	.41	.15

*p<.05 **p<.01 ***p<.001

Appendix 2

Influence of State Regulation on Child-Care Supply
[n=35 states, ß and t statistics reported]

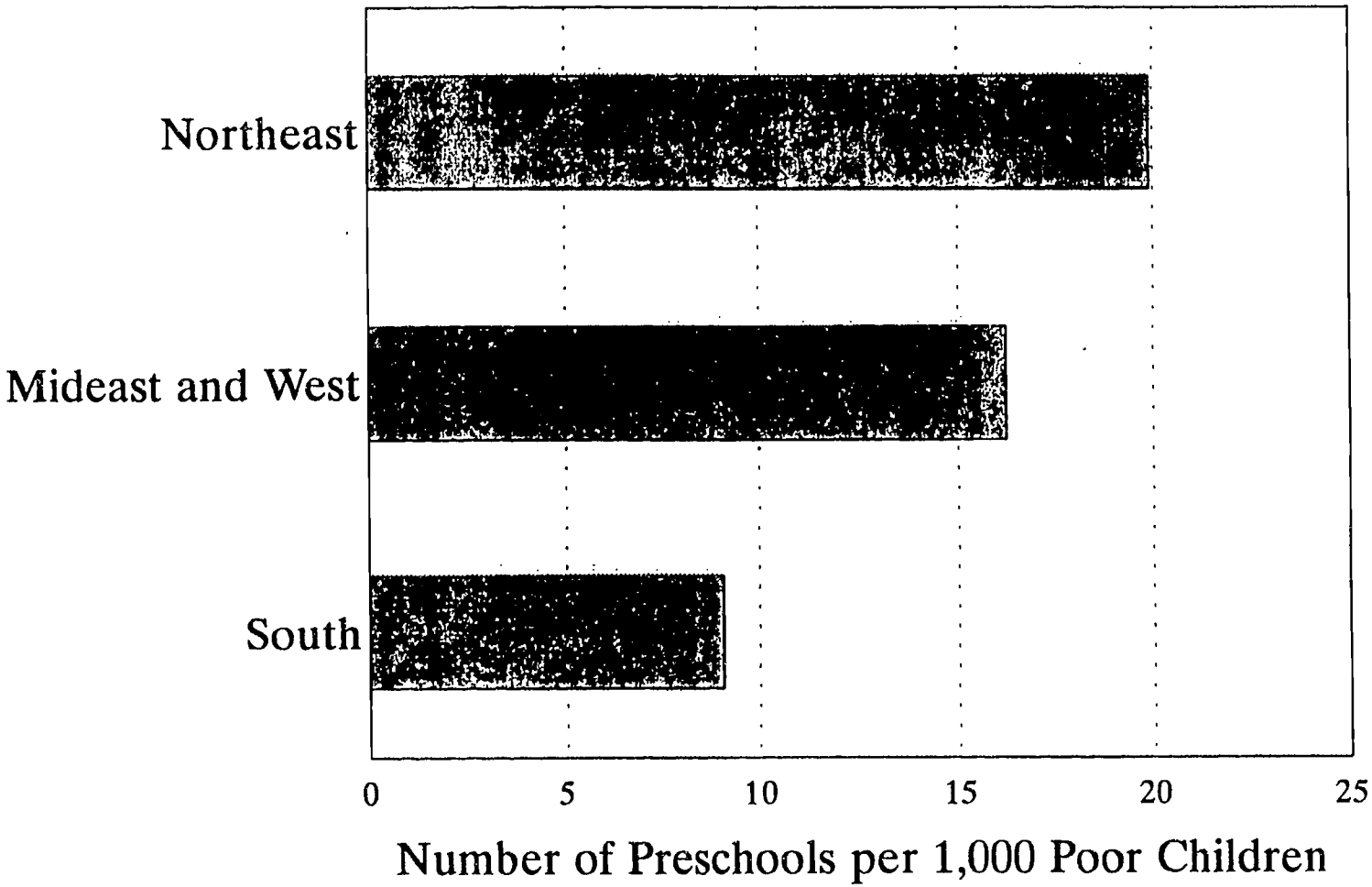
	Supply: Subsidized Centers Per Capita		
	[1]	[2]	[3]
Mean Family Income	.0002	-.0006	-.0009
	(0.38)	(-1.29)	(-1.60)
State Regulatory Intensity			
Child:staff ratio for 4 year-old class groups		17.8	9.0
		(3.22)**	(1.22)
Maximum group size for 3 year-old class groups			.33
			(1.03)
State Preschool Subsidies			4.6
			(1.88)+
Model			
Intercept	13.8	33.2	24.1
F	0.14	5.30**	3.08*
Adj. r^2	.00	.20	.22

+p<.07 *p<.05 **p<.01

Note: Sample size equals 30 states for models with state-subsidy predictor (columns 3 and 6), due to missing data.

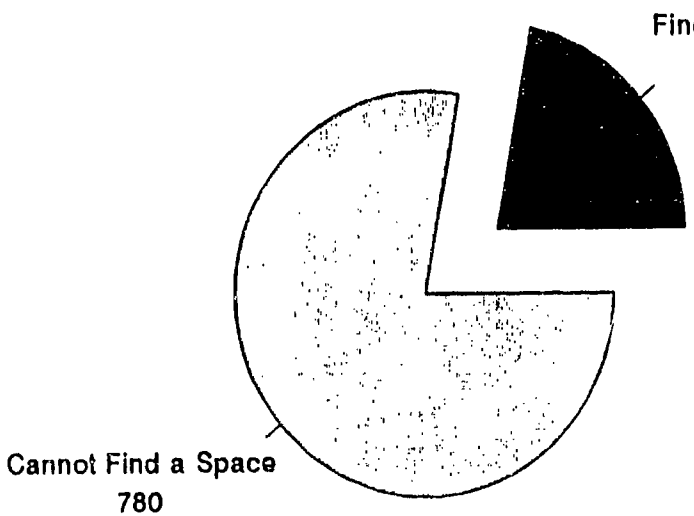
Regional Inequality in Preschool and Child Care Supply

[Supply of Subsidized Preschools by Region]*

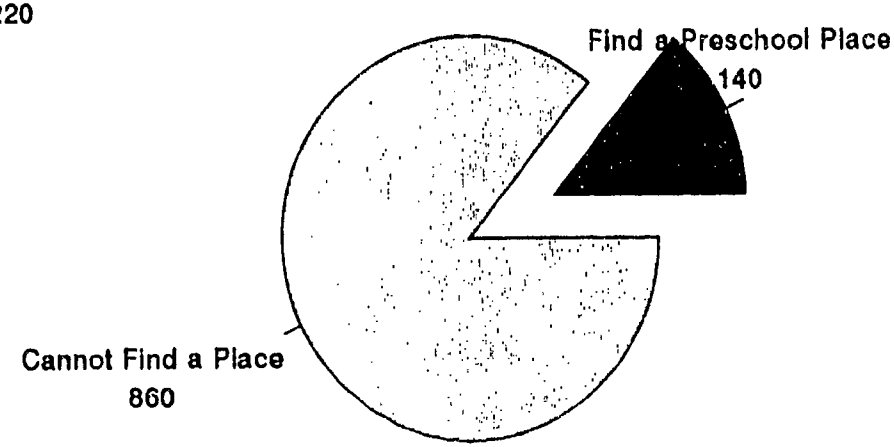


* "Subsidized centers" is defined liberally to include all preschools and child-care centers where at least 10% of the operating budget comes from government subsidies. Regional samples include 22 counties in the South; 45 counties in Midwest and West; 18 in Northeast.

Share of Children Who Find a Preschool Space per 1,000 Kids in the South

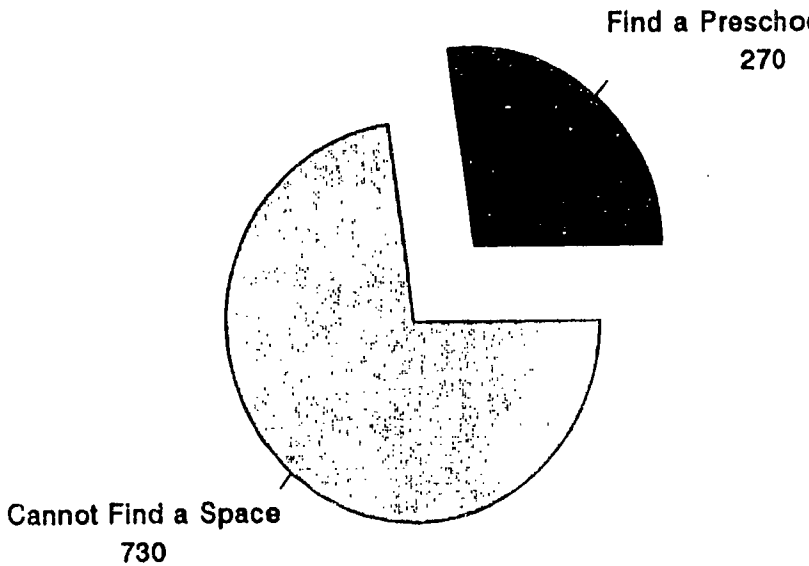


South - Affluent Counties

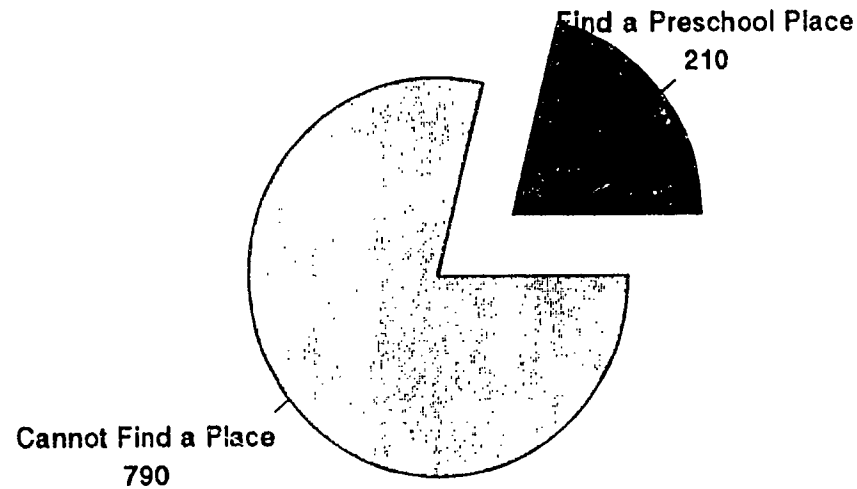


South - Low-income Counties

Share of Children Who Find a Preschool Space per 1,000 Kids in the Northeast



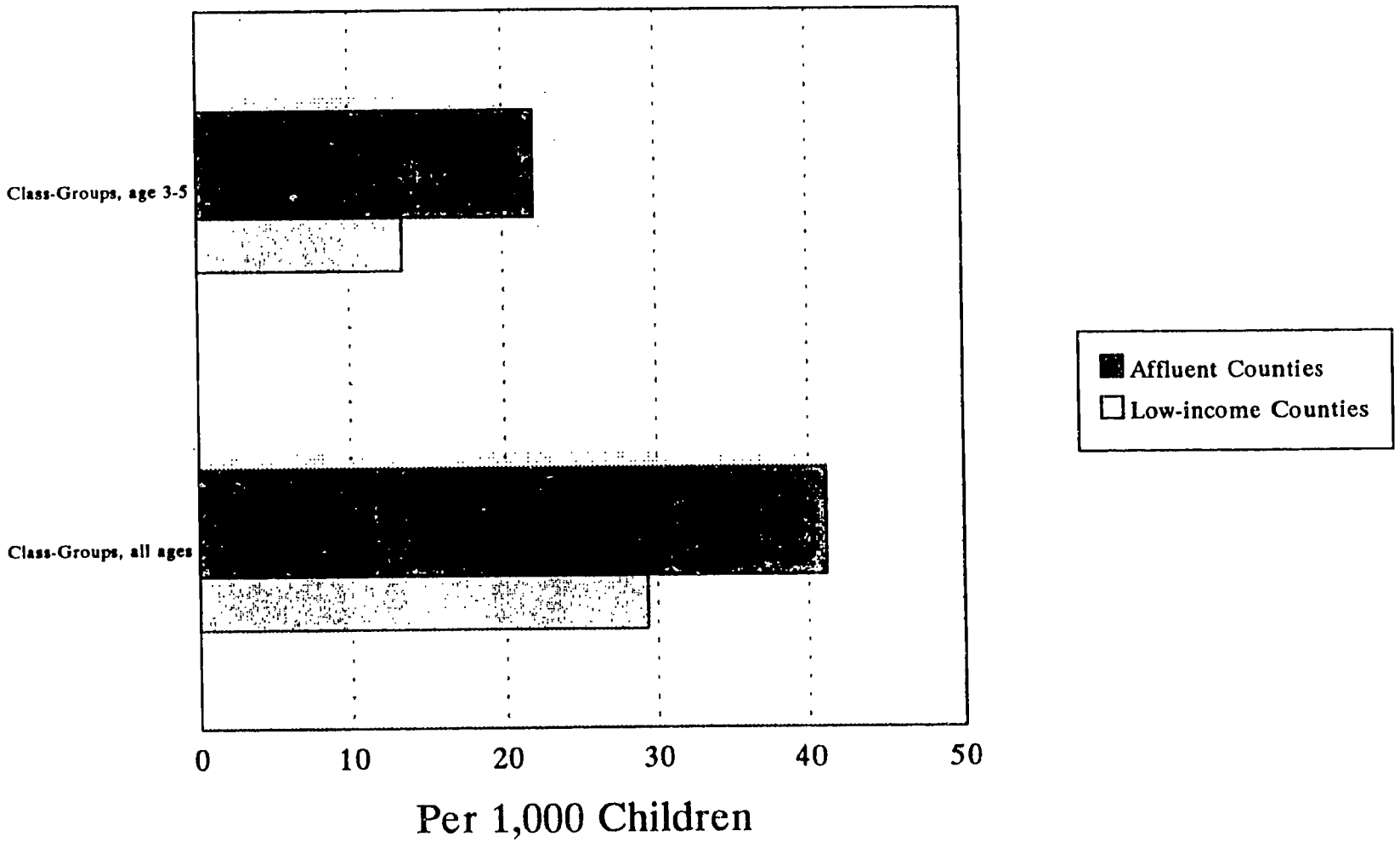
Northeast - Affluent Counties



Northeast - Low-income Counties

Affluent and Low-income Counties: Inequality in Child Care Supply

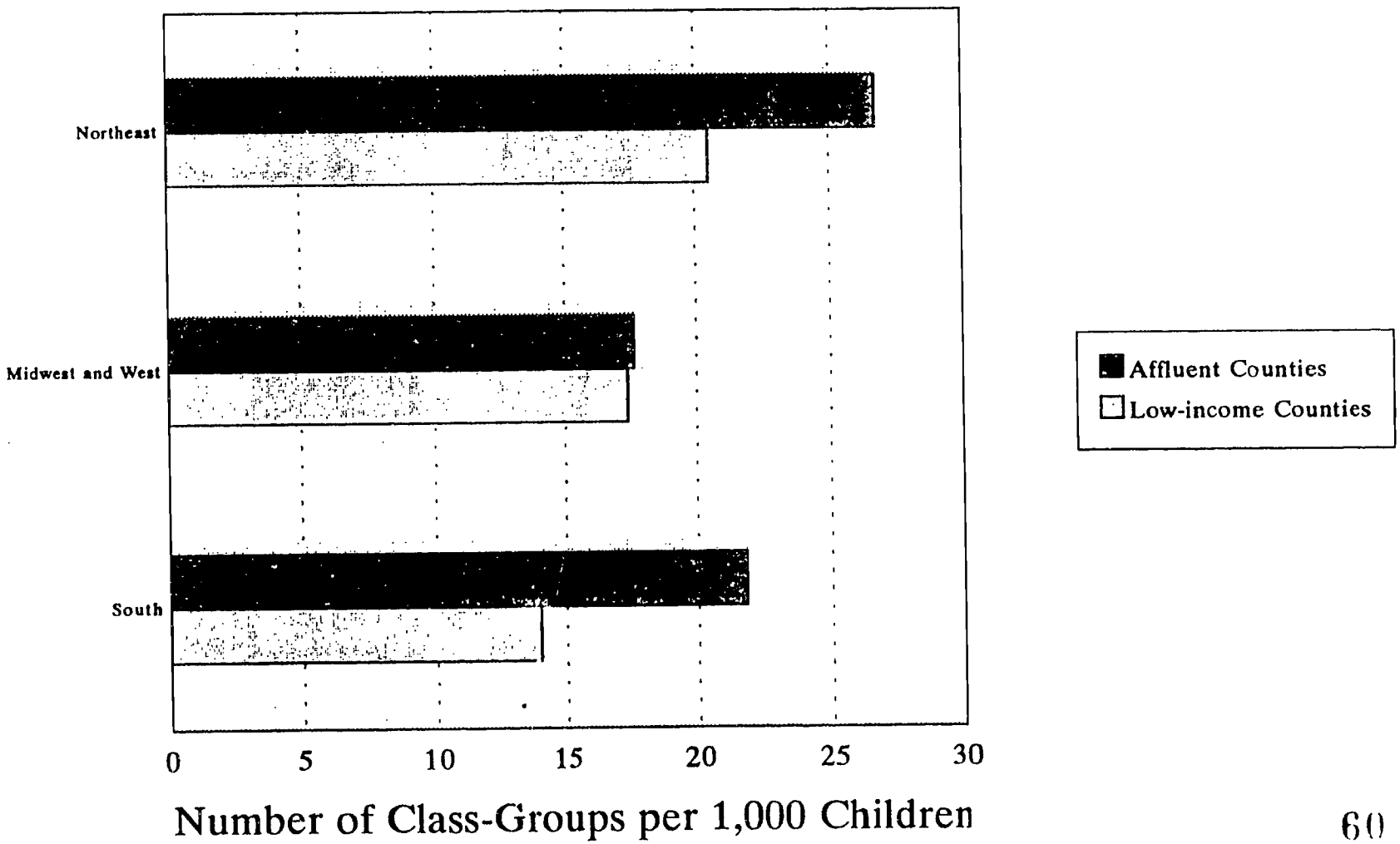
[Supply of Child Class-Groups per 1,000 Children]*



* Rich counties fall above the 75th percentile in average household income. Poor counties fall below the 25th percentile. Total number of counties equals 100.

Regional and Income Inequality in Child Care Supply

[Supply of Class-Groups for Children, Age 3-5]*



* Regional samples include 24 counties in the South; 54 in the Midwest and West; 21 in Northeast