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Child-Care Quality and Children's Social Development

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This study examined the influence on children's social development of variation in the quality of their child-care environments. The sample consisted of 166 children attending representative child-care centers that varied widely in quality. Possible relations associated with age, child-care experience, and family background were controlled using hierarchical multiple regression. Both global estimates of child-care quality and specific program features, such as director experience, ratios, and verbal interactions, were obtained from observational measures and staff questionnaires. Measures of social development were derived from parent and caregiver ratings of the children. Of greatest importance is the finding that overall quality, caregiver–child verbal interactions, and director experience were each highly predictive of the children's social development in child care. Family background measures were also significantly predictive of several of the social outcomes, whereas child-care experience showed few significant effects. The implications for social policies and future research in child care are discussed.

The developmental effects of child care have long held interest for psychologists, first because child care represented an intriguing exception to parental care, and now because some form of child care is the norm for over half of all American children. Parallel with these demographic trends, the research literature has shifted from questions that entail comparisons of home-reared children and those enrolled in child care to more sophisticated questions about how children in child care are affected by differences in program quality (Belsky, 1984; Clarke-Stewart & Fein, 1983). A related issue concerns the identification of specific quality indicators that affect child development. A third, relatively new, empirical focus is on the joint effects of child care and family variables (Everson, Sarnat, & Ambron, 1984; Howes & Olenick, 1986; McCartney, Scarr, Phillips, Grajek, & Schwarz, 1982).

The research reported here was designed to address these contemporary issues about child care as well as to cast them in a broader theoretical framework. The principal aims of the study were (a) to examine the consequences for social development of attending child-care centers that varied widely in quality, (b) to identify specific indicators of quality—for example, staff–child ratios and verbal interactions between caregivers and children—that may account for results obtained when quality is treated as a global construct, and (c) to determine whether associations between quality and child outcomes are affected by children's day-care experience or family background. The research also addresses general theoretical issues regarding environmental influences on social development.

Within the literature on the developmental effects of child care, it is the issue of social outcomes that has generated the most contradictory findings and thus the greatest controversy. On the one hand, children who have participated in child care appear to be more socially skilled than their home-reared peers, as demonstrated by their more advanced perspective-taking skills, cooperative behavior, task orientation, and confidence in social interactions (Clarke-Stewart, 1984; Howes & Olenick, 1986; Ramey, MacPhee, & Yeates, 1982; Rubenstein & Howes, 1979). On the other hand, displays of aggression, negative affect, and resistance to adult requests have been reported to be more prevalent among child-care than home-reared children (Haskins, 1985; Ramey, Dorval, & Baker-Ward, 1981; Schwarz, Krolick, & Strickland, 1973).

Several reviewers of the child-care literature have reconciled this seemingly contradictory pattern of results by attributing both the positive and negative behaviors to greater social maturity on the part of children enrolled in child care (Clarke-Stewart & Fein, 1983; Rutter, 1981), to earlier acquisition of adult social values (Belsky, Steinberg, & Walker, 1982; Schwarz, Strickland, & Krolick, 1974), or to differences in the structure of the programs (Haskins, 1985).

Other factors that may explain the diverse social outcomes ascribed to child care include variation in the quality of the child-care programs studied, the children's timing and history of child-care attendance, and family variables that affect both the choice and effects of child care. Among these factors, only the contribution of child-care quality has received systematic empirical attention.

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When direct comparisons are made of programs that vary in quality, results suggest that social development is enhanced by higher quality care (Golden et al., 1978; McCartney, Scarr, Phillips, & Grajek, 1982; Roupp, Travers, Glantz, & Coelen, 1979; Vandell & Powers, 1983). Efforts to extract the specific dimensions of quality that affect social development have revealed the major contribution of caregiver–child verbal interaction (Clarke-Stewart, 1984; Golden et al., 1978; McCartney, 1984; Roupp et al., 1979), caregiver stability (Clarke-Stewart & Gruber, 1984; Cummings, 1980), small groupings of peers and low child–staff ratios (Clarke-Stewart & Gruber, 1984; Howes & Rubenstein, 1985; Roupp et al., 1979), and specialized caregiver training and experience (Howes & Olenick, 1986; Roupp et al., 1979).

Children's social development in child care may also be affected by the age of entry or the length of time that they have been enrolled. Studies of these issues that specifically address social outcomes are just now emerging (Haskins, 1985; Howes & Rubenstein, 1985); thus, no systematic conclusions can be drawn. The work on program quality, however, has included both infant and preschool samples, implying that quality may override child-care experience as a determinant of child care's influence on social development.

Family influences on the developmental effects of child care are also richly deserving of study, because of indications (Howes & Olenick, 1986) that families served by low- and high-quality care differ significantly on measures of family stress. At the least, it is essential to control for program-selection effects in studies of child-care quality. As noted by Scarr and McCartney (1983), genotype-environment confounds characterize most studies of socialization, including studies of parent-selected child-care environments. In the absence of controls for children's family backgrounds, it is impossible to discern whether social outcomes derive from the genetic makeup or from the environment that children share with their parents.

Unfortunately, much of the research on child care can provide only limited answers to questions about both quality indicators and environmental influence. Studies of child care are typically conducted in above-average child-care programs characterized by restricted variation in key indicators of program quality. For example, the staff–child ratios in the majority of centers sampled for the National Day Care Study (Roupp et al., 1979) ranged from 5 to 9 children per staff member. In addition, few studies have controlled for possible confounds associated with differences in the family backgrounds of children in child-care programs varying in quality. Thus, effects that are attributable to child care cannot be distinguished from those that are attributable to differences in the family backgrounds of children in different programs.

This study sought to rectify the methodological shortcomings of prior child-care research on social development. It is part of a larger investigation of the developmental consequences of child-care quality designed to exemplify an emerging paradigm in child-care research that incorporates individual- and family-level influences. The findings reported here extend and clarify our previous reports, which have examined global indicators of program quality (McCartney et al., 1982) and have focused on language development (McCartney, 1984). This report addresses social outcomes and examines specific dimensions of program quality.

It was hypothesized that children attending higher-quality child-care centers would demonstrate greater social competence and adjustment. The influence of quality was expected to be attributable largely to the nature of the caregiver–child interactions and to structural features, such as child–staff ratios, that facilitate constructive interaction. Neither family background nor the children's previous child-care experience were expected to significantly affect the relation between child-care quality and social development.

Method

Child-Care Settings

Bermuda was chosen as the site of this research for two reasons that bear directly on the methodological shortcomings of prior research. First, a pilot study conducted in the most populated province in Bermuda revealed that approximately 85% of Bermudian children spend the majority of their day in some form of substitute care by the time they are 2 years of age. This reduces potential selection biases. Second, the child-care programs in Bermuda are remarkably stable and represent a wide range of quality, thus creating the opportunity to study a representative range of child care.

When this research project began in 1980, nine child-care centers in Bermuda had been in operation for over 4 years and accepted children from infancy through the preschool years. The directors of all nine agreed to participate in the study. This assured wide variation with respect to the children's family backgrounds and experience in child care. Eight of the child-care centers were privately owned; one of the centers was government-run and served predominantly low-income families.

Subjects

All children 3 years and older who had attended one of the nine target centers for 6 months or more and their parents were asked to participate in the study. A total of 166 families participated, with only 15 refusals. The children ranged in age from 36 to 68 months; 130 were Black and 36 were White. Fathers were present in 68% of the households, and extent of maternal education ranged from 5 to 22 years. The average age of entry into child care was 19 months for the participating children, suggesting high continuity of care.

Measures

Child-care environment. The quality of the child-care environment was assessed in three ways. First, Harms and Clifford's (1980) Early Childhood Environment Rating Scale (ECERS) was used to obtain observational ratings of quality on seven dimensions: personal care, creative activities, language/reasoning, fine–gross motor, social development, furnishing/display, and adult facilities/opportunities. The first six scales, which measure dimensions of the child's environment, were used in our study. The interrater reliability obtained in this study across all items on the ECERS was high (r = .82). The six subscales were highly correlated in this study (rs ranged from +.60 to +.92), so only the total scale score was used.

Second, specific indicators of quality were obtained from an extensive interview with each program director, based on the Day Care Environment Inventory (Prescott, Kritchevsky, & Jones, 1972). The interview focused on descriptive aspects of the child-care facility and program, such as staff experience and training, staff–child ratios, amount and variety of play equipment, and parent involvement. From this interview,

the director's years of experience and the child–staff ratio were selected for analysis as specific indicators of quality.

Third, the quality of verbal interactions between adults and children was assessed using an observational coding system (see McCartney, 1984) in which eight children (randomly selected) per center were observed for six 10-min segments. The number of functional utterances directed to children by caregivers and by peers provided the verbal environment measures for this report.

Children's social development. Social development was assessed using parent and caregiver ratings on two standardized measures. The preschool form of the Classroom Behavior Inventory (Schaefer & Edgerton, 1978), which yields factors for intelligence, considerateness, sociability, task orientation, and dependence, was used to assess social competence. Schaefer and Edgerton (1978) report internal consistency reliabilities ranging from .72 to .95, and interrater reliabilities ranging from .50 to .83.

The Preschool Behavior Questionnaire (Behar & Stringfield, 1974), specifically designed to screen preschool-age children in group-care settings for aggression, anxiety, and hyperactivity, was used to assess social adjustment. Behar (1977) reports interrater reliabilities of .93 (aggression), .60 (anxiety), and .94 (hyperactivity). The scale was also found to significantly differentiate children who attended a therapeutic preschool class (Behar, 1977).

Family background and home environment. Family background measures were derived from parent interviews that included demographic questions (e.g., family income, age and education of parents) as well as items from the Parent as Educator Interview (Schaefer & Edgerton, 1977), which was designed to assess parental values about child learning and development. The child's age of entry into child care and length of child-care attendance were also obtained during the parent interview.

Procedure

Between March and June 1980, two researchers visited each of the nine centers on at least three different days to administer the director's interview, collect the verbal environment data, and rate program quality on the ECERS. During the initial visit, the social measures were distributed to two caregivers per program. The instructions required the caregivers to rate all participating children item by item in order to reduce potential halo effects. The two caregiver ratings were averaged to produce the final caregiver rating on each social measure, as recommended by Schaefer and Edgerton (1977). Two additional program visits by two researchers were required to collect observational data on the verbal environment of the centers. Following their observations, the two coders individually rated program quality. Ten Bermudian college students who were naive to the purpose of the study conducted the parent interviews, during which the information about family background and child-care history and the parent ratings on the measures of social development were obtained.

Results

Descriptive Statistics

Given the importance of obtaining data on representative child-care programs, descriptive statistics for the major predictor variables of child-care quality were first examined. Wide variation characterized each of the quality measures. Scores on the ECERS ranged from 66.5 to 191.0 (M = 123.2), indicating ample variation given the 37 (low) to 259 (high) possible range. Similarly, directors' experience ranged from 11.3 to 24.5 years (M = 15.7), and staff–child ratios ranged from 1:5.7 to 1:15 (M = 1:10.5).

Preliminary Correlational Analyses

Intercorrelations were examined among the parent and teacher ratings of social development, and between sex of child and the social measures.

The degree of correspondence between the parent and caregiver ratings of social development was examined using Pearson correlations. Only the parent and teacher ratings of the children's intelligence correlated significantly (r = .35, $p < .001$). The independence of parent and teacher ratings may reflect differing perceptions of the children, or may be a function of differing sources of bias for these two groups of raters. It is important to note that the rating scales used in the study were designed exclusively for use by teachers.

Intercorrelations between sex of child and each of the social-development measures were examined in light of recent suggestions that sex of child may moderate the developmental effects of child care (Gamble & Zigler, 1986). Only 1 of the 16 intercorrelations attained significance: sex with teacher ratings of the children's dependence (r = −.20, $p < .05$). Boys were rated as more dependent than girls.

Controlling for Center Selection

Because parents select child-care programs for their children, and selection biases may covary with program quality, it is essential to control for center selectivity when examining the influence of child-care quality on social development. In order to examine the issue of selectivity, stepwise multiple regression was conducted to identify the specific family-background measures that showed the strongest relation to child-care quality. Specifically, the total quality score from the ECERS was regressed on the 16 measures of family demographics and home environment obtained from the family interview. This conservative approach was used to remove the maximum variance in center selection attributable to differences in the children's family backgrounds prior to examining the influence of child-care experience and program quality in the regression analyses reported below.

The two family-background measures that emerged from this analysis were *values social skills,* a positive predictor of the total ECERS score, $F(2, 84) = 8.85$, $p < .01$; and *values conformity,* a negative predictor, $F(2, 84) = 8.61$, $p < .01$. Parents who placed a high value on social skills and a low value on conformity selected higher-quality child-care centers than did other parents. In the hierarchical regression analyses that follow, these two family-background variables were entered prior to measures of the day-care environment. This provided a more rigorous control for center selectivity than that used in prior reports of this research (see McCartney et al., 1982), because empirically-derived, rather than estimated, predictors of selectivity were used as controls.

Data Analysis Strategy

The general strategy for the quality analyses involved controlling for age of the child, family background, and child-care experience prior to obtaining an estimate of the contribution of child-care quality to children's social development. Specifically,

Table 1
Hierarchical Regression of Children's Social Development on Age, Family Background, Child-Care Experience, and Overall Quality

	Change in R^2		
Measure/Rater	Family background: Values conformity, Values social skill	Experience: Age at entry, Time in care	Quality: ECERS
Considerateness			
Parent	.019	.004	.088**
Caregiver	.054*	.002	.329***
Dependence			
Parent	.069*	.008	.000
Caregiver	.022	.041**	.021
Sociability			
Parent	.025	.007	.050*
Caregiver	.087**	.001	.390***
Intelligence			
Parent	.010	.005	.009
Caregiver	.038	.016	.213***
Task orientation			
Parent	.008	.004	.000
Caregiver	.023	.012	.141***
Aggression			
Parent	.027	.015	.005
Caregiver	.002	.022	.018
Hyperactivity			
Parent	.002	.007	.027
Caregiver	.000	.028	.018
Anxiety			
Parent	.008	.011	.001
Caregiver	.056*	.060**	.081**

Note. ECERS = Early Childhood Environment Rating Scale. Age at entry was entered prior to the two family background measures. $N = 156$ for the parent ratings and 153 for the caregiver ratings.
* $p < .05$. ** $p < .01$. *** $p < .001$.

a hierarchical regression model was used in which the child's age at testing was entered in the first equation, followed by the two proxies for family background that affected center selection. Age at entry into care and total hours of attendance were added in the third equation. The total quality score was entered in the fourth and final equation. The model was computed separately for each of the parent and caregiver ratings of social development. A second set of analyses, using the same model, was then conducted to evaluate the influence of specific indicators of program quality: the director's years of experience, child–staff ratio, caregiver–child verbal interaction, and verbal interaction among peers.

Effects of Overall Quality

The overall quality of the children's child-care environments made a significant contribution to their social development. Table 1 presents the change in R^2 at each step of the regression analysis. Six of the 10 factors from the Classroom Behavior Inventory and one of the six subscales from the Child Behavior Questionnaire yielded significant effects for program quality, controlling for the influence of age, child-care experience, and family background.

For the parent ratings, child-care quality was predictive of greater considerateness and greater sociability. The caregiver ratings corroborated these results, with quality accounting for more than a 30% increase in their ratings of considerateness and sociability. Overall quality also contributed significantly to the caregiver ratings of the children's intelligence and task orientation, so that children in higher-quality centers were rated as higher in intelligence and more task oriented. With respect to the scales of social adjustment, quality emerged as a significant predictor of caregiver ratings of anxiety, so that caregivers in higher-quality programs rated the children as more anxious.

Prior to removing the variance accounted for by center quality, several other predictors yielded significant results. Children who were older at the time of testing were rated by their caregivers as less dependent and more intelligent and task oriented. The parents of older children rated them as more intelligent, as well, and as less aggressive and less hyperactive.

The two measures of parent values showed only a few modest relations to the social-outcome measures. For the parent ratings, the higher the value placed on conformity, the greater the child's dependence. The caregivers rated children from homes that placed a low value on conformity as more considerate, sociable, and anxious.

Age at entry and time in care were relatively poor predictors of the children's social development in child care. Only two significant relations emerged, both for the caregiver ratings. Children who spent less time in child care were rated as more dependent and more anxious, and children who entered care at an earlier age were rated as more anxious. Time in child care accounted for a 4% increment in the variance accounted for in the dependence ratings. Age of entry and time in care, combined, accounted for 6% additional variance in the anxiety ratings.

In sum, overall quality of the child-care environment exerted a consistent influence on social development. Indeed, overall child-care quality was predictive of 8 of the 16 measures of social development, in spite of the fact that measures of family background, child-care experience, and child's age were entered first. Family background typically accounted for smaller increments in the total variance than did the quality score, and child-care experience showed only two significant effects. A comparison of the amount of variance contributed by quality for the parent and caregiver ratings revealed that the caregiver ratings showed a much stronger association between quality and social development. Finally, the measures of social competence, assessed using the Classroom Behavior Inventory, were much more sensitive to differences in program quality than were the measures of social adjustment derived from the Child Behavior Questionnaire.

Effects of Specific Indicators of Child-Care Quality

The finding that overall center quality affects children's social development, although theoretically significant, is of little use to practitioners and policy makers who seek to influence specific program features that predict positive outcomes for children. The next analyses were, therefore, designed to answer the question, "What aspects of quality affect social development?"

Table 2
Hierarchical Regression of Children's Social Development on Age, Family Background, Child-Care Experience, and Specific Quality Indicators

	Change in R^2			
Measure/Rater	Director experience	Child–Staff ratio	Caregiver: Verbal interaction	Peer: Verbal interaction
Considerateness				
Parent	.003	.038*	.047*	.026
Caregiver	.097**	.002	.355***	.008
Dependence				
Parent	.001	.003	.012	.006
Caregiver	.263***	.005	.009	.203***
Sociability				
Parent	.001	.021	.028	.020
Caregiver	.181***	.009	.222***	.125***
Intelligence				
Parent	.023	.002	.016	.004
Caregiver	.011	.016	.234***	.000
Task orientation				
Parent	.008	.001	.001	.006
Caregiver	.001	.001	.279***	.041*
Aggression				
Parent	.009	.002	.005	.003
Caregiver	.037*	.018	.000	.051*
Hyperactivity				
Parent	.000	.008	.021	.000
Caregiver	.041*	.004	.005	.021
Anxiety				
Parent	.005	.003	.029	.013
Caregiver	.056**	.130***	.002	.143***

Note. Each of the four quality variables was entered last in separate hierarchical multiple regression equations. The following variables were entered first: age at testing, values conformity and values social skills, age at entry, and time in group care.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Four variables provided the focus of these analyses: director experience, child–staff ratio, verbal interaction with caregivers, and verbal interaction with peers. They were selected on the basis of their demonstrated importance in prior child-care research and the variance they exhibited across the 9 participating child-care centers.[1]

The hierarchical regression model used to assess the influence of overall quality was also used for these analyses, entering each of the quality indicators in the fourth and final equation. Table 2 presents the additional proportion of variance accounted for (change in R^2) by each of the specific quality indicators for the 16 measures of social development.

For the 10 measures of social competence, the director's experience and the amount of verbal interaction between caregivers and children were the most consistent predictors of the children's social development in child care. Director experience was a negative predictor of the caregiver ratings of considerateness, dependence, and sociability. Alternatively, verbal interaction between caregivers and children emerged as a positive predictor of beneficial social development in child care. Both parents and caregivers in centers with higher amounts of adult–child verbal interaction rated the children as more considerate, and caregivers also rated them as more sociable, intelligent, and task oriented.

Child–staff ratio showed a more modest degree of influence, accounting for a 3.8% increment in the variance accounted for in the parent ratings of their child's considerateness. Higher—that is, better—ratios corresponded to greater considerateness on the part of the children. Verbal interaction among peers showed a mixed pattern of influence, corresponding to greater dependence and lower task orientation, yet greater sociability as revealed by the caregiver ratings.

For the measures of aggression, hyperactivity, and anxiety, director experience again emerged as a significant predictor, although here it presents a more consistently positive picture. Caregivers in centers directed by adults with more child-care experience rated the children as less aggressive, hyperactive, and anxious. These results were not corroborated by parents.

Child–staff ratio showed a single significant result. An additional 13% of the variance in the caregiver ratings of child anxiety was attributable to child–staff ratios, so that children in programs with better ratios were rated as more anxious by their caregivers. The parent ratings of anxiety did not corroborate this puzzling result. The final predictor, verbal interaction with peers, emerged as a negative indicator of quality. Children in programs with higher levels of child-to-child verbal interaction were rated by their caregivers as more aggressive and more anxious.

To summarize the results for the specific indicators of center quality, children appear to fare better in child-care centers characterized by large amounts of caregiver–child verbal interaction and, consequently, relatively low amounts of verbal interaction among peers. Director experience also emerged as an important predictor of children's social development in child care, although the direction of its influence was not consistent. Social competence appears to suffer in programs run by directors with more experience, as indicated by lower caregiver ratings of considerateness and sociability. Yet the ratings of aggression, hyperactivity, and anxiety suggested that children in programs directed by adults with more experience are better adjusted. Child–staff ratios, like overall quality, showed a perplexing positive association with anxiety. Ratios, however, also showed a positive, but modest relation to parent ratings of considerateness. In general, the caregiver ratings of social development were much more sensitive than the parent ratings to variation in the specific indicators of program quality.

Discussion

The most important finding to emerge from this research is that the overall quality of the child-care environment affects many aspects of children's social competence and adjustment. The influence of quality was found in analyses that, unlike those used in other studies of child-care quality, included controls for the effects of the children's age, family background, and child-care experience.

[1] Caregiver training, a significant predictor of child outcomes in prior research (see Roupp et al., 1979), showed minimal variation in these Bermudian centers and was thus excluded from the regression analyses.

Convergence of the findings with previous reports of the Bermuda study in which child-care quality was found to have a significant impact on children's cognitive and language development (McCartney, 1984), with analyses comparing the high-quality government-run child-care program in Bermuda with the lower-quality private centers (McCartney, Scarr, Phillips, & Grajek, 1985), and with the reports of other investigators (Howes & Rubenstein, 1985; Roupp et al., 1979; Vandell & Powers, 1983) lends additional support to the assertion that variation in child-care quality affects child development. It is particularly significant that these results have emerged from research that examines representative rather than high-quality child-care centers or expensive early intervention programs that fail to reflect the real child-care choices available to most families.

The study's major weakness is the exclusive use of questionnaire measures of social development, and the notable differences in the results obtained with the caregiver and parent ratings. Moreover, the anomalous associations found between anxiety and both overall quality and ratios are perplexing and deserve further study. It should be noted, however, that the actual range of anxiety scores in this study (1.00 to 2.67) is well within the normal range on the Preschool Behavior Questionnaire, on which the standardization sample averaged 1.96 (SD = 2.34) and a comparison sample of disturbed children averaged 6.73 (Behar, 1977).

On a theoretical level, our study provides persuasive evidence of environmental influences on development, because of the inclusion of empirically derived controls for family-based center-selection confounds. Although it is entirely possible that some remaining variance due to center selection was not eliminated, the results nonetheless lend support to the optimistic stance assumed by most intervention programs that nonfamilial early childhood environments can promote positive development. Particularly significant is the new evidence that child care not designed as early intervention can nevertheless serve in this capacity if it is of adequate quality (Scarr & Weinberg, 1986).

With respect to the question "What aspects of quality affect social development?", children appear to profit from a verbally stimulating environment in which adult caregivers and children are frequently engaged in conversation. Similar findings were reported by McCartney (1984) for children's cognitive and language development. In contrast, verbal interaction with peers, perhaps because it replaces the more important caregiver talk, appears to have deleterious effects on social development. Again, this pattern matches that found for children's language development in prior reports of the Bermuda study (McCartney, 1984).

The director's experience showed a contradictory pattern of results, with lower social competence, yet better social adjustment in programs run by more experienced directors. Perhaps director experience plays a role in preventing maladjustment in child care, but does not play sufficiently powerful or constructive a role to promote social competence. In the National Day Care Study (Roupp et al., 1979), caregivers—not directors—with more years of experience were found to engage in less social interaction and cognitive stimulation with infants and toddlers. On the other hand, Howes (1983) found that experienced caregivers were more responsive to children's bids for attention. Clearly, "experience" is a multifaceted construct requiring more sensitive measures capable of deciphering beneficial features of experience and of examining their relation to competent caregiving.

The final indicator of quality examined in this research, child–staff ratios, predicted parent ratings of considerateness and caregiver ratings of anxiety. Ratios have frequently emerged in child-care research as a significant positive indicator of quality (Howes, 1983; Howes & Rubenstein, 1985; Roupp et al., 1979). In comparison, the results of the current study are relatively modest. And the link between ratios and anxiety—like that between overall quality and anxiety—challenges one's intuitive views of child-care quality as well as the thrust of most research evidence.

Taken as a whole, these results have implications for social policies and future research on child care. This study also provides a useful model for research designed to examine general issues of environmental influence on development.

In terms of social policy, this research adds further documentation to the importance of investing in high-quality child care. Unfortunately, issues of program quality are generally overshadowed by concerns about the sheer availability and cost of child care (Phillips, 1984). Quality is monitored exclusively at the state level by regulations that establish a floor below which children's health and safety are presumed to be jeopardized, not a ceiling designed to promote positive development (Gamble & Zigler, 1986; Phillips & Zigler, in press). The research evidence reported here suggests not only that higher standards of quality are imperative if children are to thrive in child care, but that specific features of child care that are amenable to regulation can be identified.

The research implications call attention to the critical need to take into account variation in quality when child care is studied, rather than to revert to prior models of research in which child care is treated as a uniform intervention. Just as home care varies in quality, day care varies in quality. The challenge facing researchers is to advance understanding of the processes that underlie the influence of child-care quality on child development. Available evidence suggests that tangible program features, such as staff–child ratios and staff training and experience, exert their influence by facilitating positive interactions among staff and children.

This study also exemplifies an emerging research paradigm that attempts to control for family background variables when examining environmental—including child care—predictors of child development. Variation in quality must be examined in concert with family factors to obtain an accurate portrayal of how children fare in child care. Exposure effects that entail examining interactions between program quality and time in care also warrant study because of many families' extensive reliance on child care. Longitudinal research on child care, as distinct from early intervention programs, is also essential because of the political and theoretical significance of documenting the long-term consequences of child care.

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