Early child-care experiences: Associations with social information processing and academic performance during kindergarten

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ABSTRACT

Parental reports of 585 children's childcare experiences during the year preceding kindergarten were used to index the extent of children's involvement in three types of childcare: center-based (e.g., daycare center, Head Start, preschool), informal (e.g., relative-based or sitter-based) and parental. Childcare choices covaried with household SES, with children from higher SES homes more likely to participate in center-based care, whereas children from lower SES homes were more likely to spend time in informal care or parental care. More time in center-based care was associated with higher amounts and stability of peer contact. Modest, but significant, associations were obtained between social information processing variables and children's experience in childcare. Moreover, different patterns of association with social information processing were obtained for each of the three care types. Kindergarten teachers rated children who had spent more time in center-based care as more academically skilled, and children who attended greater amounts of informal care as less academically skilled. Parental care was associated with poorer academic skills only for children from lower SES homes. These results indicate that the type care is an important consideration in contextualizing children's preschool childcare experiences.

Children's experiences in out-of-home care during the preschool years has been a topic of interest to many researchers (e.g., Bates, Marvinney, Kelly, Dodge, Bennett, & Pettit, 1994; Meece, Colwell, & Pettit, 1999; Howes, Phillips, & Whitebrook, 1992; Lamb, 1998; NICHD Early Child Care Research Network, 1998; Peisner-Feinberg & Burchinal, 1997; Vandell & Corasaniti, 1990). Several researchers have argued that concerns due to increased maternal participation in the workplace necessitated investigations of the impact of out-of-home care. By the age of 6, 84% of U.S. children have received some form of supplemental care or education (U.S. Department of Education, 1995). In fact, the majority of infants, and over two-thirds of preschoolers, in the United States are cared for by someone other than their parent on a regular basis (Lamb, 1997).

Numerous studies have investigated potential outcomes of early childcare experiences (see Burchinal, 1999, for a review). These studies have largely fallen into two separate literatures, one investigating the effectiveness of early childhood intervention

programs designed to benefit the cognitive development of at-risk children, and a second focused primarily on the impact of typical childcare experiences on the development of children from all backgrounds (Barnett, 1995). Early research in the second area focused on the potential negative impact that out-of-home care might have on children's social development, due to disruption of the mother-child relationship (e.g., Belsky, 1986). Although some studies have raised concerns about the potential negative impact of out of home care (e.g., Bates et al., 1994), several studies have demonstrated that the impact of time spent in

out-of-home care is at least partially mitigated by the quality of care (e.g., Clarke-Stewart, 1989; Howes, Phillips, & Whitebrook, 1992; Lamb, 1998; Peisner-Feinberg & Burchinal, 1997).

Recently, researchers have called for a contextual approach to understanding children's childcare experiences (see Burchinal, 1999). One hypothesis that has gained currency is that discrepancies between children's home environment and their childcare experiences may result in differential effects on children (Caughy, DiPietro, & Storbino, 1994). Thus, high-quality care may serve as a buffer for children from risky home environments, whereas poor-quality care may have negative effects for children from enriching, responsive home environments. Evidence that high quality intervention programs may have particularly beneficial effects (at least short term) for children from low-income homes (see Lazar & Darlington, 1982, for a review), along with findings of differential effects of childcare on cognitive or language development related to socioeconomic status or family structure (Baydar & Brooks-Gunn, 1991; Bryant, Burchinal, Lau, & Sparling, 1994; Caughy et al., 1994; Vandell & Corasaniti, 1990) lend support to this hypothesis. Other researchers (Lamb, 1997) further argue that, for instance, the potential negative impact of low-quality childcare might be buffered for children from enriching, responsive home environments, whereas children may be at increased risk if they experience both risky home environments and low-quality childcare (Burchinal, 1999; Lamb, 1997).

Along the lines of the quality-of-care argument, it also may be likely that experience in different types of out-of-home care (i.e., sitter-based care, relative-

based care, daycare, and preschool care) may be differentially associated with later outcomes. To a great extent, the type of childcare that has received the most attention from researchers has been center-based care (e.g., childcare centers, preschools), while time spent in informal childcare arrangements has been overlooked, or grouped with time spent in center-based care (e.g., Bates et al., 1994). However, organized, center-based childcare (including daycare centers, Head Start, and nursery school or preschool programs) accounts for only 29.3% of the childcare used by working families with children under age five (Casper, 1998). In addition to center-based care, parents often rely on informal childcare arrangements. Relatives provide care for about 25% of children from working families, with grandmothers accounting for about 17% alone. Poor and low-income families rely on relative care more than working families in general, with relative care accounting for nearly 53% of the childcare arrangements of poor families, and 57% of the childcare arrangements of working families with incomes between $14,000 and $30,000 (Casper, 1998). In addition, over 20% of children from working families were cared for by a non-relative, either in their own home or in the provider's home (Casper, 1998).

A few studies have compared child outcomes for children attending different types of childcare. In an early review, Clarke-Stewart and Fein (1983) concluded that center-based childcare was associated with increased intellectual performance (at least while children were attending centers) regardless of children's gender, ethnicity, social class, or temperament. In a later review, Clarke-Stewart (1989) argued that children who participated in high-quality

center-based care exhibited more self-confidence, independence, extroversion, assertiveness, and higher intelligence, compared with children with experience in other types of care, or no out-of-home care. Two more recent studies also have obtained different patterns of associations with outcomes for center-based care and informal care. In a 1992 study, Clarke-Stewart reported that, among a predominantly middle-class sample, children who experienced full- or part-time center-based care scored higher on measures of verbal ability and social competence than did children who experienced only home-based care (whether the caregiver was a parent, sitter, or day care provider). Recently, the NICHD Study of Early Child Care compared cognitive, language, and social outcomes for over 1100 children who participated in a variety of childcare settings. Children in center-based care scored higher on cognitive and language measures at age 24 months and age 36 months than did children in other types of care. These differences remained significant after controlling for family and childcare characteristics (NICHD, 1998).

However, some researchers have found that center-based care was related to poorer outcomes than other types of care. In a longitudinal study of Swedish children, preschoolers cared for in childcare homes engaged in more positive and competent play with peers than did children in center-based care (Lamb, Sternberg, Knuth, Hwang, & Broberg, 1994). Still other studies have reported no differences in outcomes between involvement in center-based childcare or childcare homes, for infants and preschoolers (Barglow, Vaughn, & Moliter 1987; Moore, Snow, & Poteat 1988). Thus, the impact that participation in

different types of child-care might have on children's subsequent development remains somewhat unclear.

Two areas in which participation in center-based programs may have particular impact are social and academic. First, preschool teachers may intend to influence children's thinking about social interactions, and children who attend center-based programs may have increased experience interacting with same age peers in a supportive environment. Thus, children who attend center-based programs may exhibit more positive social information processing patterns than do preschoolers who experience other types of care arrangements. In fact, research suggests that participation in developmentally appropriate preschool programs may enhance children's social problem solving skills (Fry & Addington, 1984). Second, participation in center-based programs may set the stage for later learning opportunities when children begin kindergarten (see Dunn, Beach & Kantos, 1994; Stipek, Feiler, Daniels, & Milburn, 1995). For instance, children who participate in preschool programs may be better prepared for kindergarten than other children because they demonstrate better listening, comprehension, and verbal skills than do other children (Dunn et al., 1994; Marcon, 1992). Thus, participation in center-based care during early childhood may have beneficial consequences, particularly for children's social information processing and academic readiness.

The current investigation seeks to examine contextual factors, such as SES, maternal employment, family structure, and children's peer experiences associated with families' childcare choices. Furthermore, the current work will

examine patterns of association between participation in different types of out-of-home care arrangements (i.e., center-based, informal, and parental) during the preschool years and both children's social information processing and academic skills in kindergarten. It is hypothesized that participation in organized, center-based, programs will be positively associated with children's social information processing and academic skills in kindergarten, whereas participation in informal types of out-of-home care (sitter-based, relative-based) will not. Further, recognizing the importance that context may play in understanding the impact of children's childcare experiences, the role that family socioeconomic status may play in moderating associations among childcare variables and academic skills will be examined.

Method

Participants

This study was completed as part of the ongoing Child Development Project, a multisite longitudinal study of children's adaptation (see Bates et al., 1994; Pettit et al., 1997; Pettit et al., in press). Families were recruited for participation from each of three sites (Nashville and Knoxville, Tennessee, and Bloomington, Indiana) in the Summers of 1987 (cohort 1) and 1988 (cohort 2). Schools considered generally representative of each of the three communities were selected in consultation with local school personnel. At the time of kindergarten pre-registration (during the Spring preceding the September of

matriculation), parents were approached by research staff and asked to participate in a longitudinal study of child development. Of the families approached, about 75% of the parents agreed to take part in the study, resulting in 585 families. The sample was quite diverse in terms of child sex (52% male), ethnicity (81% European-American, 17% African-American, and 2% other ethnic groups), and family composition (26% of the children lived in single parent homes). The average family score on the Hollingshead (1975) four-factor index of social status (computed from demographic information provided by the parents) was 40.4 indicating a predominantly middle-class sample. However, a wide range of statuses was represented, with 9%, 17%, 25%, 33%, and 16% of the families being classified into the five possible classes (from lowest to the highest) recommended by Hollingshead (1975).

Measures

Child care. In the summer before children entered kindergarten, or within the first weeks of school, parents were separately given questionnaires and were interviewed at home by a graduate student or post-graduate research assistant (See Bates et al., 1994). Measures from the 1.5-hr. Developmental History Interview included caregiving arrangements, family stress and social support, parent discipline practices, child exposure to violence, child conduct, and peer relations. To facilitate detailed accounts, parents were asked about the facets of the child's history in three separate eras: pregnancy to 12 months, age 1-4 years, and age 4-5 years. These eras were chosen to facilitate recall, not to represent

equal intervals of time. Information about the use of out-of-home care was indexed following the procedure outlined in Bates et al. (1994). In the current study, parents' reports of their children's out-of-home care during the year prior to the entrance of kindergarten (age 4-5 years) was used to compute the extensiveness of childcare, because this time frame was contemporaneous with the interviews . Parents' descriptions of their childcare arrangements were clarified with questions, and then coded as the level of usage of several out-of-home settings: relative-based in the relative's home or the child's home, small-group sitter, center-based group day-care, and preschool. Each setting was coded as 0 = no usage, 1 = modest or brief (used less than once a month), 2 = moderate (used less than once a week), 3 = frequent (5-20 hours per week), or 4 = major (more than 20 hours per week). In a sample of 24 independent cases in which the interviewer and another listener coded this index, the agreement was .80. As one index of the validity of the out-of-home care extensiveness indices, mother and father scores (based on separate interviews by the same interviewer) correlated .72.

In the current study, the extensiveness of informal care was computed by summing the codes for relative and sitter care for children who were coded as 0 or 1 (none or brief) for both center-based day care and preschool. To compute center-based care, codes for center-based daycare and preschool were summed for children who were coded as 0 or 1 for both relative and sitter based care. To obtain a measure of parental care, children who were coded as 2 or higher (moderate to major) for either relative, sitter, center-based daycare, or preschool

were coded as 0. Because even children in predominantly parental-based care may experience brief episodes of care outside the home, children who were coded as 1 in only one category of out-of-home care (relative, sitter, day care, or preschool) were coded as 1 for maternal care. Children who were coded as 0 (none) for all out-of-home care categories (relative, sitter, day care center, and preschool) were coded as 2 (exclusively parental care). Although the parental care variable was constructed so that care predominantly from mothers or fathers would be captured, an examination of the data revealed that, in all cases in which children were scored a 1 or 2, mothers were the primary caregivers.

Contextual variables. During the parent interview, parents were asked to describe the extent of their children's involvement with same age peers across settings. Interviewers rated children's amount of peer contact, on a five-point scale, in which 1 represented less than 5 hours of contact with peers during a typical week, a 2 represented 5 - 15 hours of contact a week, a 3 represented 15 - 25 hours of contact per week, a 4 represented 25 - 40 hours of contact per week, and a 5 represented over 40 hours of peer contact per week. Parents' descriptions of their children's peer interactions also were rated for stability of peer contact. Stability was rated on a 5-point Likert-type scale in which a 1 corresponded to highly unstable peer experiences, and 5 represented highly stable peer experiences. Finally, parents responded to questions about how much exposure to aggressive peers their children experienced in various childcare settings (e.g., daycare, preschool, sitter care) during the preschool years. Interviewers rated children's exposure to aggressive peers across settings

on a scale of 0 (none) to 4 (extensive) to form a measure of children's exposure to aggressive peers. Information about family SES, marital status of the mother (unmarried vs. married or living with a partner), and maternal employment (coded as none vs. part-time or full-time) also was collected during this interview.

Social information processing. During the home visits conducted the summer preceding kindergarten, children were separately interviewed in order to assess their social information processing. Following procedures outlined in Harrist, Zaia, Bates, Dodge, and Pettit (1997), children were presented with several hypothetical social dilemmas depicting either a peer-group entry situation (in which the child is asked to imagine being rebuffed or ignored when attempting to join an on-going social activity) or a peer-based provocation (in which the child was asked to imagine being provoked by another child). Following the presentation of each of the hypothetical vignettes, children were asked a series of questions designed to tap four social information-processing steps (Dodge, 1986): encoding (perceiving presented social cues); interpretation (deducing the intentions portrayed by the cues); response generation (producing potential strategies to respond to the cue); and response decision (evaluating potential strategies and choosing the response deemed most appropriate). Trained research assistants, who were blind to the hypothesis of the current study, presented each child with three sets of hypothetical social vignettes using multiple methods. The vignettes were always presented in the following order: (1) an eight-item oral set with accompanying cartoon drawings to assess response generation; (2) an eight-item oral set with accompanying cartoon drawings used

to assess interpretation; and (3) a 24-item videotaped set featuring 6- to 11-year-old actors to asses encoding, interpretation, and response decision. The videotape-based set depicted three types of group entry and peer provocation stories (eight stories of each type), in which the intention of the provocateur in the story was deliberately varied as either clearly hostile, ambiguous, or clearly accidental. In approximately 5% of all of the assessments, children became fatigued and were allowed to stop after completing 18 of the 24 videotaped measures.

Children's responses to questions following each of the hypothetical vignettes were written down and coded by the interviewer as they were given. Cross year-stability for these social information processing variables and social information processing variables collected during subsequent years up to the third grade was reported by Harrist et al. (1997). Reliability information for the social information processing variables used in this study was reported by Weiss et al. (1992). For all variables, inter-rater reliability was good, with κ s > .80 in all cases; internal consistency also was good, with α s ranging from .73 to .96.

Step 1: Encoding. To assess encoding skill, children were asked to describe what happened in each videotaped story immediately after it was presented. Each response was scored as 1 (totally relevant), 2 (partially relevant), or 3 (not relevant). In the current work, codes were reverse scored so that higher scores reflected greater degrees of relevance, and a mean relevance score was computed across the 24 stories.

Step 2: Interpretation. Children's tendency to attribute hostile intent to the

actions of others was assessed through children's responses during the 24 videotaped stories, and the second set of eight stories read aloud, presented during the social information processing interview. Following each of the vignettes, children were asked AWas the other kid being mean or not being mean?@ Answers were scored immediately by the interviewer as being either benign intent (scored 0) or hostile intent (scored 1). The proportion of hostile responses within each format (read story or videotape) was computed and converted to a *z* score. The two standardized scores where then summed to form a single composite of hostile attributions.

Step 3: Response generation. Children were read eight hypothetical social problems (half provocation and half group entry situations), each accompanied by cartoon drawings that depicted the accompanying story. After the presentation of each story, children were asked to generate as many solutions to the problem (up to 10) as they could. Children's responses were coded into one of seven categories: (1) aggressive, which included responses that were either physically or verbally aggressive, (2) asking / telling , for example "I'd ask her if I could swing" or "I'd tell her it is my turn to swing," (3) sharing / turn taking, for example, "I'd ask to share the swing" or "I'd say you can swing next if I can swing now," (4) bribing / bargaining, for example, "She could play with my gameboy if I could swing now," (5) passive / ineffective, for example, "I'd go away," (6) authority intervention, for example, "I'd ask the teacher if I could swing," and (7) irrelevant, responses that did not pertain to the goals of the story. For each of the seven categories, the proportion of responses coded as that category to the total

number of responses that children generated was computed for use in analyses.

Step 4. Response Decision. Children's evaluations of various responses also were assessed using the video-tape based measure. Children were shown the protagonist of each of the videotaped stories reacting to the provocation or rebuff with a variety of responses. Three types of responses were shown for each videotaped story: competent responses, aggressive responses, and inept responses. Following the presentation of each of the responses, children were asked to evaluate whether each response was a "good thing or a bad thing to say or do." Children's responses were coded on a 1-4 scale (1 = very bad, 2 = bad, 3 = good;, 4 = very good). The mean rating for each type of response across the 24 stories was computed, yielding three response decision variables: competent response endorsement, aggressive response endorsement, and inept response endorsement.

Teacher measures. In the following spring of the kindergarten year, teachers were asked to complete the Teacher Report Form of the Child Behavior Checklist (Achenback & Edelbrock, 1986). Raw scores from several of the subscales were included in the current study. These subscales have shown good test-retest and inter-rater (teacher and aide) reliability (see Achenback & Edelbrock, 1986). Only items that were included on both the male and female versions of the subscales were included in constructing variables. First, scores on the Academic Performance and Learning subscales were standardized and summed to form a single index of academic skills. Raw scores from the attention problems subscale were used to index teacher's perceptions of children's

attention abilities in the kindergarten classroom. Raw scores from the aggression, withdrawn, and externalizing behavior problems subscales were each used for teacher-ratings of social behavior.

Results

Associations among childcare and contextual variables. Table 1 presents means of the three childcare variables for children of single-parent or married families, and for children whose mothers worked outside the home and children whose mothers do not. There was no difference in the means of any of the childcare variables between children from single-parent and married households. On average, children whose mothers worked outside the home experienced more time in center-based care ($t = 2.07$, $p < .05$) and informal care ($t = 6.06$, $p < .01$), and were coded lower in parental care ($t = 7.07$, $p < .05$), than were children whose mothers did not work outside the home.

Associations between the three peer involvement variables and each of the childcare variables are displayed in Table 2. More experience in center-based care was significantly associated with higher ratings of both the amount and stability of peer contact, as well as higher ratings of contact with aggressive peers. The stability of peer contact was significantly and negatively associated with both time spent in informal care and parental care. Parental care also was significantly and negatively associated with the amount of peer contact.

Associations among childcare and information processing variables.

Pearson r correlations among the childcare variables and the information processing variables are displayed in Table 3. A modest, but significant, positive correlation was obtained between the time spent in center-based and children's relevancy scores (processing step 1). No significant associations were found between the three childcare settings and children's tendencies to make hostile attributions (step 2) or children's endorsement of social strategies (step 4), with the exception of a significant and negative association between time spent in informal care and endorsing inept strategies. Several modest, but significant associations were obtained between experience in each of the childcare settings and the variables representing social strategy generation (processing step 3). The more time that children spent in center-based care, the less likely they were to generate strategies rated as aggressive, and the more likely they were to generate strategies seeking authority intervention and bribing or bargaining strategies. Time spent in informal care was associated with generating more strategies rated as aggressive and fewer strategies rated as bribing or bargaining and irrelevant. Parental care was associated with generating fewer strategies seeking authority intervention

Associations among childcare variables and teacher-rated variables. Table 4 presents associations among the three childcare variables and the teacher-ratings of academic skill, attention problems, and social behavior. Teacher-rated academic skills were positively and significantly associated with time spent in center-based care, and negatively and significantly associated with time spent in both informal care and parental care. Time spent in center-based care was

significantly associated with fewer teacher-rated attention.

problems, whereas time spent in informal care was significantly associated with greater teacher-rated attention problems. No significant associations were obtained between the childcare variables and ratings of social behavior, with the exception of the significant and negative association between parental care and teacher-rated withdrawn behavior.

Interactions between childcare variables and family SES**.** A series of regression equations were computed to examine interactions between each of the childcare variables and family SES in the prediction of teacher-rated academic skills. In each regression equation, the variables were first centered. In the first regression equation predicting teacher-rated academic skills, time spent in center-based care and family SES were entered on the first step. On the second step, the multiplicative interaction term between center-based care and SES was entered. The same procedure was used to compute two additional hierarchical regressions predicting teacher-rated academic skills. In the second regression equation, informal care and SES were entered on the first step, followed by the multiplicative interaction of the two variables on the second step. In the final regression equation, parental care and SES were entered on the first step and the interaction term was entered on the second step. As shown in Table 5, there was a significant interaction term between parental care and SES, but the interaction terms for center-based care and informal care were not significant.

Analyses guided by the recommendations of Aiken and West (1991) were then conducted to clarify the nature of the interaction between parental care and

SES in predicting academic skills. Teacher-rated academic skills was predicted from parental care with the value of SES fixed at low (one standard deviation below the mean), medium (the mean), and high (one standard deviation above the mean). As the fixed level of SES increased, the slope of the relationship between parent care and academic skills varied from $\underline{\beta}$ = -.16 (standardized beta for low SES) to $\underline{\beta}$ = .03 (standardized beta for mean SES) to $\underline{\beta}$ = .09 (standardized beta for high SES) (see Figure 1). T-scores were computed to test the significance of the betas between parent care and academic skills at each level of SES. Only the beta between parental care and academic skills at the low level of SES was significant ($\underline{t}$ = 2.42, $\underline{p}$ < .05). Thus, parental care was significantly and negatively associated with academic skills only for children from low SES homes; this association was not significant for children whose families were near the mean of SES among this sample, and was positive, but not significant, for children from higher SES homes.

Discussion

One goal of the current study was to examine contextual factors associated with preschool children's experiences in different types of childcare. The extent of children's experience in different types of childcare co-varied with the household SES. The higher the household SES, the more time that children were likely to spend in center-based childcare, such as daycare centers and preschool, in the year before kindergarten. On the other hand, the lower the

families' SES, the more time that children spent in either informal childcare, including relative- and sitter-based care, or parental care. In this sample, children's participation in various forms of childcare did not differ by family structure, in terms of single-parent versus married parent households. Not surprisingly though, children whose mothers worked outside the home were more likely to spend time in both center-based and informal care. As more poor mothers participate in education and training or enter the workforce due to welfare reform, it seems likely that lower SES families may increasingly rely on informal childcare arrangements to at least partially account for their childcare needs, and so a better understanding of the complexity of parent's childcare choices seems warranted.

Children's involvement with same-age peers varied as a function of their participation in the different childcare categories. The more time that children spent in informal care settings, the less stable their peer experiences were rated by interviewers. Similarly, parental care was associated with lower ratings of peer contact and peer stability. On the other hand, children with more extensive participation in center-based care had peer experiences that were rated as higher in the amount of contact and stability, and also were more likely to be exposed to aggressive peers Although the hit-or-miss nature of peer experiences for children receiving informal or parental care is not surprising, these findings demonstrate that the type of childcare children experience is an important factor in understanding children's social ecology prior to entering kindergarten.

The fact that time spent in center-based care was associated with more

frequent and stable peer contact may be one key in understanding the modest, but significant, associations between social information processing patterns and the extent of children's experience in different childcare types. For example, more experience in center-based childcare was associated with encoding more accurate and relevant social cues. This might be because children in center-based care have had more have had more opportunities to practice peer interaction, and so the ability to attend to and encode social cues may be more salient to them. More extensive peer involvement may also help to explain some of the differences in the pattern of associations between social strategy generation and childcare type. For example, generating social strategies that involved bargaining was associated with more time in both informal and center-based care, perhaps because these children had more practice with peer interaction to draw from. However, although children who spent more time in center-based care were more rated as more likely to have been exposed to aggressive peers, time spent in center-based care was negatively associated with generating social strategies rated as aggressive. In contrast, time spent in informal care was associated with generating more aggressive social strategies. It may be that, in addition to differences in exposure to peer contact, different types of childcare provide children with different levels of experience with classroom rules and routines, and this influences children's social strategy repertoire. For example, more extensive participation in center-based care was associated with the generation of strategies that sought authority intervention - which some teachers in early childcare centers may encourage - whereas

parental care was negatively associated with strategies that sought authority intervention.

Another important goal of the current work was to examine associations between children's academic readiness in kindergarten and their childcare experiences during the preceding year. Center-based care was significantly and positively associated with kindergarten teachers' ratings of children's academic skills, and significantly and negatively associated with teachers' ratings of children's attention problems. The more time that children spent in informal care settings, on the other hand, the more likely teachers were to rate the children's academic skills lower and attention problems higher. Again, it is likely that children who participated in greater amounts of center-based care arrived at kindergarten with more knowledge and experience of classroom routines, which may account for these findings. Parental care was associated with lower teacher-ratings of academic skills only for children from lower SES homes. This finding supports the hypothesis that the impact of childcare experiences may depend upon discrepancies between children's home environment and their childcare experiences (Caughy et al., 1994).

Results from this study demonstrate that the type of childcare is an important consideration in contextualizing children's care experiences. However, it is important to point out that the measures of childcare used in this study only assessed the extent of participation in the three types of childcare, and not the quality of care that children received. This is a major limitation of this investigation, because variations in quality in each setting - center-based,

informal, and parental - likely moderate associations between childcare and both social and academic outcomes. Moreover, it is important to recognize that parents' child care choices are complex. It is likely that many parents use a patchwork of multiple childcare options - of varying types, locations, levels of formality, and levels of quality - to meet their childcare needs. Future research is necessary to understand the complexity of children's childcare experiences and how these may impact children's social and academic outcomes.

References

Achenback, T. M., & Edlbrock, C. S. (1986). Manual for the Teacher's Report Form and Teacher Version of the Child Behavior Profile. Burlington: University of Vermont Press.

Aiken, L. S., & West, S. G. (1991). Multiple regression: Testing and interpreting interactions. Newbury Park, CA: Sage.

Barglow, P., Vaughn, B. S., & Moliter, N. (1987). Effects of maternal absence due to employment on the quality of infant-mother attachment in a low-risk sample. Child Development 58. 945-54.

Barnett, W. S. (1995). Long-term effects of early childhood programs on cognitive and school outcomes. The Future of Children, 5.

Bates, J.E., Marvinney, D., Kelly, T., Dodge, K.A., Bennett, D., & Pettit, G.S. (1994). Child care history and kindergarten adjustment. Developmental Psychology, 30, 690-700.

Baydar, N., & Brooks-Gunn, J. (1991). Effects of maternal employment and child care arrangements on preschoolers' cognitive and behavior outcomes: Evidence from the children of the National Longitudinal Survey of Youth. Developmental Psychology, 27, 932-945.

Belsky, J. (1986). Infant day care: A cause for concern? Zero to Three, 6, 1-7.

Bredekamp, S. & Copple, C. (Eds.). (1997). Developmentally appropriate practice in early childhood programs, revised edition. Washington, DC: NAEYC.

Bryant, D. M., Burchinal, M. R., Lau, L. B., & Sparling, J. J. (1994). Family and classroom correlates of Head Start children's developmental outcomes. Early Childhood Research Quarterly, 9, 289-309.

Burchinal, N. R. (1999). Child care experiences and developmental outcomes. Annals of the American Academy of Political and Social Science, 563, 73-97.

Casper, L. M. (1997). Current Population Reports: Who's Minding Our Preschoolers? U.S. Census Bureau.

Caughy, M. O., DiPietro, J. A., & Strobino, D. M. (1994). Day-care participation as a protective factor in the cognitive development of low-income children. Child Development 65, 457-71.

Clarke-Stewart, A. (1989). Infant day care: Maligned or malignant? American Psychologist 44, 266-73.

Clarke-Stewart, A. (1992). Consequences of child care for children's development. In A. Booth (Ed.) Child care in the 1990s: Trends and

consequences, Hillsdale, NJ: Lawrence Erlbaum.

Clarke-Stewart, K. A., & Fein, G. C. (1983). Early childhood programs. In M. M. Haith and J. J. Campos (Eds.) Handbook of child psychology. Vol. 2, Infancy and developmental psychobiology, 4th ed. New York: John Wiley.

Dodge, K. A. (1986). A social information processing model of social competence in children. In M. Perlmutter (Ed.), Minnesota Symposia on Child Psychology, (Vol. 18, pp. 77-125). Hillsdale, NJ: Erlbaum.

Dunn, L., Beach, S. A., & Kantos, S. (1994). Quality of the literacy environment in day care and children's development. Journal of Research in Childhood Education, 9, 24-34.

Fry, P. S., & Addington, J. (1984). Comparison of social problem solving of children from open and traditional classrooms: A two-year longitudinal study. Journal of Education Psychology, 76, 318-29.

Harrist, A. W., Zaia, A. G., Bates, J. E., Dodge, K. A., & Pettit, G. S. (1997). Subtypes of social withdrawal in early childhood: Sociometric status and social-cognitive differences across four years. Child Development, 68, 278-294.

Hollingshead, A. B. (1975). Four Factor Index of Social Positioning. Unpublished manuscript, Yale University, New Haven, CT.

Howes, C., Phillips, D.A., & Whitebrook, M. (1992). Thresholds of quality: Implications for the social development of children in center-based child care. Child Development, 63, 449-460.

Lamb, M.E. (1997). Nonparental child care: Context, quality, correlates, and consequences. In I.E. Sigel and K.A. Renninger (Eds.), Handbook of Child

Psychology, Vol. 4: Child Psychology in Practice pp. 73-134.

Lamb, M. E., Sternberg, K. J., Knuth, N., Hwang, C. P., & Broberg, A. G. (1994). Peer play and nonparental care experiences. In H. Goelman and E. V. Jacobs (Eds.) Children's play in childcare settings, Albany: State University of New York Press.

Lazar, I., & Darlington, R. (1982). Lasting effects of early education: A report from the consortium for longitudinal studies. Monographs of the Society for Research in Child Development, 47, 2-3.

Marcon, R. A. (1992). Differential effects of three preschool models on inner-city 4-year-olds. Early Childhood Research Quarterly, 7, 517-30.

Meece, D., Colwell, M. J., & Pettit, G. S. (1999, April). Infant-care, Self-care, and Early Adolescent Peer Contact: A Longitudinal Study of Developmental Risk and Continuity in Nonparental Care. Paper presented at the biennial meeting of the Society for Research in Child Development, Albuquerque, NM.

Moore, B. F., Snow, C. W., & Poteat, M. (1988). Effects of variant types of child care experience on the adaptive behavior of kindergarten children. American Journal of Orthopsychiatry 58, 297-303.

NICHD Early Child Care Research Network. (1998). Early child care and self-control, compliance, and problem behavior at twenty-four and thirty-six months. Child Development, 69, 1145-1170.

Pettit, G.S., Laird, R.D., Bates, J.E., & Dodge, K.A. (1997). Patterns of after-school care in middle childhood: Risk factors and developmental outcomes. Merrill-Palmer Quarterly, 43, 515-538.

Peisner-Feinberg, E. S., & Burchinal, M.R. (1997). Relations between preschool children's child-care experiences and concurrent development: The cost, quality, and outcomes study. Merrill-Palmer Quarterly, 43, 451-477.

Stipek, D., Feiler, R., Daniels, D., & Milburn, S. (1995). Effects of different instructional approaches on young children's achievement and motivation. Child Development, 66, 209-323.

U.S. Department of Education (1995). National Household Education Survey. National Center for Education Statistics.

Vandell, D.L., & Corasaniti, M. A. (1990). Variations in early child care: Do they predict subsequent social, emotional, and cognitive differences? Early Childhood Research Quarterly, 5, 555-572.

Vandell, D.L., & Posner, J.K. (1999). Conceptualization and measurement of children's after-school environments. In S.L. Friedman & T.D. Wachs (Eds.), Measuring environment across the life span: Emerging methods and concepts (pp. 167-196). Washington, DC, American Psychological Association.

Table 1

Mean values of childcare variables for children from single-parent and married households, and for children whose mothers work outside the home and whose mothers do not.

	Center-based care (range 0-8)	Informal Care (range 0-8)	Parental Care (range (0-2)
Single Parent	1.56	.64	.36

Married Parents	1.47	.50	.31
Mother works outside home	1.57[a]	.80[a]	.23[a]
Mother does not work outside home	1.28[b]	.26[b]	.68[b]

note: Means with different subscripts are significantly different from each other at the p < .05 level.

Table 2

Associations among childcare variables and both children's peer experiences and household SES.

	Center-based care	Informal Care	Parental Care
Amount of peer contact	.28**	.03	-.27**
Stability of peer contacts	.30**	-.18**	-.23**
Exposure to aggressive peers	.12**	-.06	-.04
Household SES	.17**	-.08*	-.19**

note: * = $p < .05$; ** $p < .01$

Table 3

Associations among childcare variables and social information processing variables.

	Center-based care	Informal Care	Parental Care
Step 1: Encoding			
Relevancy	.10*	-.06	-.06
Step 2: Interpretation			
Hostile Attributions	-.05	.07	-.01
Step 3: Response Generation			
Asking / Telling	.03	.01	-.03
Authority Intervention	.11**	.01	-.10*
Bribing / Bargaining	.08*	.08*	.05
Sharing / Turn Taking	-.01	.01	.03
Passive / Ineffective	-.06	-.01	.03
Irrelevant	-.01	-.07*	.03
Aggressive	-.09*	.08*	.05
Step 4: Response Endorsement			
Competent	.02	-.06	-.03
Aggressive	-.03	.04	-.04
Inept	.04	-.10*	-.01

note: * = $p < .05$; ** = $p < .01$.

Table 4

Associations among childcare variables and teacher-rated variables.

	Center-based care	Informal Care	Parental Care
Academic Skills	.12**	-.10**	-.12**
Attention Problems	-.07*	.08*	.06
Externalizing Behavior	.06	-.01	-.05
Aggressive Behavior	.05	.01	-.05
Withdrawn Behavior	-.03	.02	-.08*

note: * = $p < .05$;** = $p < .01$.

Table 5

SES as moderator of association between childcare variables and kindergarten academic skills.

Dependent Variable	Step	Variables entered on step	Δ R^2	β[a]	p
Academic Skills	1	Center-based Care		.20	.09
	1	SES	.14*	.41	>.01
	2	Interaction Term	.00	-.17	.21
Academic Skills	1	Informal Care		-.08	>.05
	1	SES	.14*	.36	>.01
	2	Interaction Term	.00	-.18	.20
Academic Skills	1	Parental Care		-.29	>.01
	1	SES	.14*	.31	>.01
	2	Interaction Term	.01*	.25	>.01

notes: [a] standardized betas are reported; * = $p < .05$

Figure 1

Graph of the slope between Parental Care and Kindergarten Academic Skills at multiple levels of SES.