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ABSTRACT

Research conducted in the United States and Canada on the effects of group care outside of family settings for 20 or more hours per week on a regular basis shows few differences between day care and home reared children on four major variables: attachment, social interactions, cognitive development, and physical health. Of nine studies of attachment, only one found significant negative effects for day care children and two replications of the design of this study did not confirm its results. In the area of social interaction, day care children were found to be less interested in strange adults but more socially active with familiar peers than were the home reared children. Infant and toddler day care generally facilitated cognitive development especially for lower working class children. In regard to the health of children, the consensus of physicians associated with day care programs is that there are no serious medical consequences of day care if the center maintains adequate space, sanitation, staff, and medical supervision. Research aimed at investigating the effects of day care has been global, directed primarily at the identification of differences between the two groups, and the children studied were attending primarily University-affiliated programs. It seems time to move on to more refined hypotheses which reflect the range of children, families, programs, and developmental phenomena available in day care settings.

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Infant-Toddler Group Day Care: A Review of Research

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## Infant-Toddler Group Day Care: A Review of Research

Controversy continues regarding the effects of day care on young children. Advocates view child care as meeting "the needs of children for experiences which will foster their development as human beings" (Day Care - 1, 1971, 1), while opponents warn of irreparable damage to children, their families, and society (Boyd, 1976; Congressional Record, 1975, a, b).

Although day care began in the United States nearly a century and a quarter ago, it wasn't until the 1960's that the effects of such experiences began to be studied. Interest in potential impacts was stimulated by both political and sociological events, primarily the increasing number of mothers of young children entering the labor force and the introduction of a Federal welfare reform proposal which included a work requirement. Both of these trends involved the care of young children by someone other than the child's own parent for a large part of the child's day, thereby challenging the traditional conception of mothering. While nursery schools and Head Start have made attendance in half-day programs not only acceptable, but desirable for many 3-5-year-olds, the possibility of longer daily separation from mothers, especially for younger children, has aroused grave concerns.

The theoretical basis for most of the day care research has been the importance of early experiences for later development. However, unlike half-day programs in which the emphasis (since 1965, at least) has been on the potential for educational and other benefits, much of the day care research has focused on predicted harmful effects, especially on social-emotional development.

A second area of apprehension has been that of infants' physical health and well-being; and to a lesser extent, researchers and the public have also been concerned with intellectual development of day care children. Such fears have arisen primarily from the devastating effects of institutionalization on infants, the attribution of these effects to separation of from the mother, and the tendency to equate daily care by others with the deprivation of institutionalization (Ainsworth, 1962; Bowlby, 1951).

The purpose of this paper is to review research conducted in the United States and Canada for child-related impacts of infant and/or toddler day care attendance. For this discussion, day care is defined as the care, education, and supervision provided children on a regular basis which augments that given by parent(s) or others with legal responsibility for the children. Although this includes half-day programs, babysitting, and other care provided in the child's own or another's home, this review includes only studies of group care outside of family settings for 20 or more hours per week, on a regular basis. This summary is further limited to consideration of children in such care who were not diagnosed as severely handicapped.

#### Effects of Day Care on Attachment

Much of the concern about the care of very young children outside the home has centered around potentially harmful effects on the mother-child relationship, especially on the development of attachment. The theoretical basis for such investigation has been almost exclusively Bowlby's ethological model in which attachment is considered a special affective, reciprocal relationship between mother or other attachment figure based on proximity (Bowlby, 1973, 1969, 1951). Young children want to be near their

mothers, generally reacting positively to their presence and with distress to their departure. (Infants may be attached to more than one person and the principal attachment figure can be someone other than the biological mother provided that person treats the child in a "mothering" way, primarily by engaging in lively social interactions with the child and by responding readily to his advances (Bowlby, 1969, 306). However, for brevity, the term mother is used in this discussion to signify the attachment object, either the biological mother or another figure.)

Although attachment is seen as instinctive, Bowlby considers its development to be dependent on the mother's responsiveness to the infant. Initially the mother must assume total responsibility for reducing the distance between her infant and herself, but as the child learns to signal the mother and as s/he develops the physical mobility to establish or maintain proximity, the responsibility becomes more shared. Chronologically, infants begin orienting and directing signals toward a discriminated figure around 4 months of age, with clear differentiation in orientation usually by 6-7 months. From about 6 until 24-36 months of age, young children are active in initiating and maintaining contact with an attachment figure. Tolerance for greater distances between the object of attachment and child increases with the child's growing curiosity and mobility; and by age 3, most children readily spend some time away from their mothers.

However, when such an attachment relationship is not established or is interrupted during the formative period, severe developmental consequences are predicted. Bowlby attributed the acute anxiety, excessive need for love, powerful feelings of revenge, guilt and depression found in institutionalized children to the lack of such attachment relationships (1951). Effects vary with the degree of disruption but, even when children under 3



with good attachment relationships with their mothers were hospitalized for a few days, their behavior was altered both during the absence and after their reunion with their mothers. The distressing effects of separation in such settings can be reduced by familiarity with the environment, presence of siblings, and care by single mother substitutes.

Since day care involves daily separation from the mother and presumed attachment figure, and care by other persons, one of the major research questions has been the effects of such care on the development and maintenance of attachment relationships. Based on Bowlby's work, it was expected infant and/or toddler care would have detrimental effects on attachment relationships and that such effects would be directly related to the age of child at time of entry into group care, the more serious outcomes expected for children in day care between 6 and 24 months of age.

A number of University-based, longitudinal projects have been undertaken to investigate the effects of children and to demonstrate model infant-toddler care. Studies usually included measures of several developmental domains. For this review, however, data for each area are discussed separately.

Although measures vary among studies, nearly all included some assessment of attachment. The measure was generally some version of the "strange situation" developed by Ainsworth and her colleagues in which the child's behavior is observed in a standard sequence of episodes during which his/her mother and/or a stranger was present, departed, and returned (Ainsworth & Bell, 1970). Dependent variables were changes from the baseline with only mother and child present in proximity, posture, facial expression, protest, crying, and other signs of distress. (Summary data from studies with measures of attachment of infants and toddlers in day care are shown in Table 1.)



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Insert Table 1 about here

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One of the earliest University day care programs was the Demonstration Project for Group Care of infants at the University of North Carolina (Keister, 1970 a, b). The Center was modeled after good home care. Children were kept in small groups with 1 adult for each 5-6 children. Staff provided consistent, affectionate, and individualized care within an age-appropriate, challenging play environment.

Over a period of 21 months, matched pairs of middle class day care and home-reared children were assessed periodically with the Bayley Infant Development Scales and/or Stanford-Binet; Vineland Social Maturity Scale and Preschool Attainment Record (PAR) (an unstandardized extension of the Vineland covering children from birth to 84 months); and 2 experimental situations designed to measure self-assertion and readiness to separate from mother. In a comparison of the initial and final assessments, the only significant difference on social-emotional measures between the two groups was a higher slope on the unstandardized PAR indicating a faster rate of development for day care children. (Results of intellectual measures are discussed in the following section of this review.) Unfortunately, no data is reported for the length of the day care experience for the research sample although infants could enter the program at 3 months of age and there was an indication that some children had attended for nearly 2 years.

A second large research and demonstration program was undertaken at Syracuse University. The Children's Center was designed to serve children from 6 months to 3 years in an environment which would "offset any

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development detriment associated with maternal separation and possibly add a degree of environmental enrichment frequently not available in families of limited social, economic, and cultural resources" (Caldwell & Richmond, 1968, 327). The program provided an "atmosphere in which people and objects give proper levels and quantities of stimulation in a context of emotional warmth, trust, and enjoyment" (Caldwell, et al., 1970, 412).

Several reports on children from this program have been published. Caldwell, et al. (1970), compared primarily lower class Caucasian and Black 30-month-olds who had been enrolled in day care 6-9 hours per day for an average of 18.8 months with home-reared children of the same age. Measures of mother-child attachment, home stimulation, and children's intellectual development were used. Seven different behaviors considered part of attachment were rated by observers for mothers and children during semi-structured interviews with a social worker at the Center. Judgements of both mothers and children were made for good affiliation, nurturance, hostility, permissiveness, dependency, happiness, and emotionality. Home visits were used to complete a 72-item Inventory of Home Stimulation and either the Stanford-Binet or the Cattell Infant Intelligence Scale were used to measure cognitive development at 12 and 30 months.

Using a conservative level of significance ( $p$ -values of .10) in order to avoid Type II errors on the attachment measures, Caldwell, et al., found day care children to be more dependent and day care mothers to be less permissive. There would be no differences, however, if  $p$ -values of .05 were used.

At Cornell, Ricciuti and colleagues conducted a series of studies of the effects of extended day care on infants' responses to familiar and strange adults (Ricciuti, 1974; Ricciuti & Poresky, 1973; Johnson &

Ricciuti, 1973). The children were enrolled in a small experimental nursery which was part of a research and demonstration program concerned with the development of guidelines for quality infant group care (Willis & Ricciuti, 1975). No background data is reported for any of the subjects.

In a study conducted in 1972-73, a small sample of day care (4 or 8 hours of care each day) and a matched home-reared group were observed monthly in an experimental strange situation, from ages 2<sup>1</sup>/<sub>2</sub> to 12-13 months (Ricciuti, 1974, Study B). There were no significant differences between the two groups although day care children exhibited more distress than did the home-reared sample when left by the mother with a stranger.

Later observations were made of the approach to a new social situation by these same children plus those in an earlier study who had attended day care only 4 hours each day during their first year (Ricciuti, 1974, Study D). At the time of the follow-up, all the children were between 12-19 months of age, although no information about day care experiences beyond the first year were included. The research setting was a large playroom with a teacher and 3 or 4 3-year-old children were seated around a table. In a standardized sequence the mother entered the room with the child; encouraged him/her to play with the children; and moved out of sight. Variables were contact, proximity, and visual orientation to mother and movement toward children. Children who had attended day care during their first year moved farther from their mothers and spent less time either looking at them or in direct physical contact than did the home-reared group. Day care children also spent more time closer to and looking at the other children than did the home-bound.

The most recent longitudinal investigation of day care infants included both working and middle class children from predominantly intact



families in the Boston area (Kagan, et al., 1977; Kearsley, et al., 1975).

About half the children were Chinese and half Caucasian. Participation in

the program was limited to children who were first or second born; normal

full-term pregnancy and delivery; and free from physical abnormalities.

Home-reared children were matched for sex, ordinal position, and family

background. All were assessed every 2 months from 3½-13½ months of age and

then again at 20 and 29 months.

Day care children entered the center at approximately 3½ months of age and attended for over 2 years. The program reflected a middle class bias with an emphasis on individualized social interactions and cognitive stimulation.

Kearsley, et al. (1975), reported children's reaction during a brief separation from their mothers in a laboratory setting in which the mother left the child when s/he was contentedly playing with toys. Based on data from 3½-20 months observations of a predominantly working class sample, the only significant effect was age. There were marked increases in protest at 9½ and 13½ months which leveled off some at 20 months. The protest was representative of the total group, not just a few extreme cases.

Later data for a larger group of children in the same day care program revealed a drop in separation protest at 29 months (Kagan, et al., 1977).

Using several different measures of social-emotional development as a part of a larger study, Kagan and colleagues found little difference for 20 and 29 month assessments between home-bound and children who attended the center for over two years. Differences which were observed favored the day care population. In situations with strange peers, day care children were less inhibited and less vigilant. The only cultural and class difference found for the social-emotional measures was that working class Chinese day

care children were less apprehensive during a visit to an unfamiliar center than were peers who were home-reared.

In addition to the longitudinal investigations of a range of infant day care questions, several short term studies of attachment have also been undertaken. The only report of any significant negative effects of day care was that of Blehar (1974), which has received considerable attention. In that study, 30 and 40-month-old middle class children who had attended day care approximately 4½ months compared unfavorably with home-reared children of the same ages. Data from the Ainsworth and Bell "strange situation" showed the day care children cried more; engaged in more oral behavior in the presence of strangers when their mothers were absent; and resisted and avoided their mothers more. Home-reared children, on the other hand, engaged in more distal interaction with their mothers and maintained closer proximity to strangers. Age by group interactions revealed the oldest day care children engaged in the least exploration and the most searching for their mothers during their absence. Age by group by episode interactions showed the older day care children showing more proximity seeking after their first separation from their mothers and the youngest home-bound group engaged in the most/after the second separation. These results have been interpreted by the author as revealing anxious ambivalent attachment in the older day care children and avoidant behavior in the younger day care population, similar to the effects found for major separations.

However, a later study using the same experimental setting and approximately the same age children revealed few differences between home-reared and day care samples (Ragozin, 1975; ~~in press~~). The one result similar to Blehar's was that day care children also engaged in less give and take of objects with a stranger. Ragozin also found that day care children created

and maintained distance from their mothers at significantly higher rates than did home-reared-but with an absolute measure of distance, more or less than 3 feet, the total distance between mothers and children was not significantly different for the two groups.

Differences in methodology and data reduction techniques may account for some of the discrepant results of the two studies. Blehar coded from transcripts using 15" intervals for frequency measures and ratings for the social interaction variables while Ragozin used two observers to simultaneously code different aspects of the children's behavior at 6" intervals. Ragozin also excluded from analysis all dependent measures which were not exhibited by 30% of the sample and occurring at a rate of 4% in one of the episodes in analysis; thereby eliminating three of the variables Blehar found significant--resisting proximity to mother, crying, and actively seeking mother in her absence. Ragozin also had a much smaller sample of younger children.

A third investigation using the same methodology but with much younger children yielded results similar to Ragozin's. Doyle (1974, 1975) also found day care children attending less to the stranger than a carefully matched group of home-reared children; but no evidence of weakened or insecure attachment.

A second source of data about the effects of day care on mother-child attachment comes from the relationship with his/her caregiver. Are caregivers mother-replacements, mother-substitutes with whom children also develop close relationships, or disinterested, unresponsive persons? Several investigators have examined these questions, both in laboratory and naturalistic settings, with consistent results. There was no evidence of preference for caregivers by day care children when both mothers and

caregivers by day care children when both mothers and caregivers were present. Relationships with caregivers were less clearcut. In some instances, however, familiar caregivers were generally viewed positively by the children and appeared to also be attachment figures with whom children had relationships although not as strong as those with the mothers.

Both Ricciuti & Poresky (1973) and Farran & Ramey (1977) observed infants' reactions to mothers and caregivers in laboratory settings. Ricciuti & Poresky conducted a longitudinal study with monthly observations of infants from the time they entered day care at 2-3½ months of age until 12-13 months of age. The same 3 staff members provided consistent care for the year. They used a variation of the strange situation procedure on two different days, once with the caregiver first and once with the stranger first. Until 7 months, responses to both the stranger and caregiver were generally positive. Beginning with the 8th month, the infants discriminated between the two, continuing to react positively to the caregiver and becoming less positive to the stranger. Beginning around 7 months, the child displayed similar distress at being left with the stranger by either the mother or the caregiver. When the infant had been left alone with the stranger, the approach of the caregiver increased the positive affect or reduced the distress of the child. Being left alone with the caregiver produced little or no distress until 12 months; but then, the distress was less than when the infant was left alone with the stranger.

With a different task, a much wider age range, and Black children from lower socio-economic families, Farran and Ramey found overwhelming preferences for mothers but no differences in behavior with teachers and a stranger. No information was included about either the program or the caregivers in this particular situation. There was, however, some indication that a child's

behavior with teacher may reflect the mother-child relationship. Correlations with the Home Observation for Measurement of the Environment instrument completed when each child was 6 months old showed visits to the teacher's side of the room were positively related to the Maternal Involvement Scale and negatively related to contacts and time spent with the mother. Also, mothers rated as punitive when their babies were 6 months old were less apt to have toys extended to them.

Reports of child behavior during their arrival, separation, and reunion in the day care setting confirm the laboratory results. In addition to the previously cited laboratory data, Ragozin (1975) also observed 2 days in the day care center. She found increased proximity and communication with the mothers at the end of the day but no differences in the behavior of 2- and 3-year-olds. When both teacher and mother were present, children stayed closer to their mothers, touched, followed, and communicated more with them.

An interesting methodological note was the finding that comparisons of this data with that obtained in the strange situation laboratory situation revealed little intra-individual consistency.

Data from a longitudinal study of children from 2-13 months of age suggested both some developmental trends and differences related to the age of children at the time of enrollment and daily amount of time spent in the center. Although the sample was small and there were no statistical analyses, observations over a 7-month period indicated generally positive reactions to caregivers' greetings with less positive responses to their parents' departure. At the end of the session, children were clearly pleased at their parents' return although there was some decline of positive responses around 12 months of age. The authors attributed the decline to increasing



autonomy rather than feelings against the parents. The least positive reactions were exhibited by children who had begun day care around 5 months of age and who were in the center 8 hours a day.

Additional insight into possible day care effects may be gained from data regarding similarities and differences in quantity or quality of care provided by mothers and other caregivers. In a small study of infants being cared for in different settings, Dittmann (1967) found the patterning of general activities, motor behavior, and routine care to be similar for infants being cared for by their own mothers and for those in family day care and in centers. The major differences were that the mothers caring for their own displayed more "affectional" behavior, both positive and negative, to their infants than did other caregivers. Day care babies were more apt to be confined to crib or play pen. Babies in groups were cared for by more different people and were less often isolated from other children than were infants at home.

Differences favoring day care children were found in comparisons of matched groups of toddlers in the two settings (Rubenstein & Howes, 1976). Although there were no differences in total amount of positive interaction with adults, there was in the nature of that exchange with more adult-infant play, more goal play, more sharing of objects with adults, more reciprocal smiling, and more adult noncaregiving touching in the day care centers. Home-reared children responded more to their mothers' talking than day care children did to their teachers, but home-bound infants also cried more and their mothers were 4 times as restrictive as adults in the centers.

#### Effects of Day Care on Other Social Interactions

Group care is a social setting which provides experiences with both adults and children not available to home-bound children, and the data clearly

indicate greater peer interaction among day care children. (Studies of social interaction other than attachment are summarized in Table 2.)

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Insert Table 2 about here

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In observations of 6- to 12-month-olds in day care, Durfee and Lee (1973) found even the youngest babies initiating contact with peers. At all ages the contacts were very brief with the modes of initiation changing with increasing age from visual regard to approach and exploration of the peer and her/his toys to more sophisticated overtures such as smiling or offering a toy.

Studying older children who had attended day care at least 4.7 months, Rubenstein and Howes found 17- to 20-month-olds spent about 25% of their time in active interaction with peers in day care. Only 1% of that time was in conflict situations. Over half of the time was engaged in play with mutual involvement in activities or mutual awareness of each other. Further, the developmental quality of play with inanimate objects was enhanced when the toddlers were engaged with peers.

With strange peers, results are mixed. With mothers present, Doyle found children of the same age as Rubenstein and Howes to initiate fewer social interactions with strange peers during a laboratory session than did home-reared children. Younger day care toddlers in the Ricciuti study (D) spent more time looking at unfamiliar children and Kagan, et al., found day care children to be less vigilant and less inhibited than the home-bound with unfamiliar peers.

MacRae and Herbert-Jackson (1976) compared 2-year-olds who had been in day care a little over a year with peers who had attended 1-6 months. The children with more day care experience were rated by their caregivers as getting along better with their peers than did the newer children.

Children in the preceding studies appear to be primarily middle class. Follow-up data for primarily lower class children who had been enrolled in infant-toddler day care also revealed greater social interaction in comparison with newly enrolled peers, but with some possible negative overtones.

A series of follow-up studies with children who had attended the Syracuse Children's Center provide information about some longer term social-emotional effects of infant group care. Twenty children who had attended the Children's Center an average of 3 years transferred to a new program in which matched peers with no previous group program experience were also enrolled. Some children in the day care sample were the same as those reported in the previous Caldwell, et al., research. Schwarz, et al. (1973), observed 16 pairs of children on their first day in the new program and again 5 months later. The previous day care group was rated as having more positive affect at the beginning of the first day but there were no differences later that day or after 5 months in the program. The Children's Center group also was judged to be more socially interactive with greater increases across time.

Lay & Meyer (1971) investigated the patterns of behavior in an open environment program setting with all 40 children. Based on point-time sample observations collected over 7 months, the children with previous day care experience engaged in more large muscle activity, participated less in creative and dramatic play; and played less with small manipulative materials and language activities than did their matched peers. In the area of social interaction, there were no differences between the two groups in their conduct with adults. With peers, however, children with previous day care experience had both more verbal interaction and more positive verbal interactions than did the new children. The Children's Center transfers also



interacted more with peers who had been enrolled in the infant-toddler program with them.

Data based on ratings of these same children at two different points during the school year confirm the preference for motor activity for previous day care children (Schwarz, et al., 1974). However, in contrast with Lay & Meyer, Children's Center children were judged less cooperative with adults and more physically and verbally aggressive with both adults and peers than the children enrolled in group day care for the first time.

#### Effects of Day Care on Cognitive Development.

Infant and toddler day care also facilitated cognitive development. (See Table 3 for a summary of these studies.) The most dramatic differences between day care and control children were for low income Blacks who entered the Frank Porter Graham Child Development Center at the University of North Carolina, Chapel Hill, around 2 years of age (Robinson & Robinson, 1971). The mean Stanford-Binet and Peabody Picture Vocabulary Test scores for these day care children between 2½ and 4½ years of age were 120 and 107 respectively compared with 86 and 78 for home-reared peers. Day care infants who entered between 4 and 6 months of age also performed better than the control group on the Bayley Scales, especially on the Mental Scale at 18 months when scores for the home-reared dropped. Day care children in this program generally did better on verbal measures than on sensorimotor tasks.

Although only limited information was reported, the content of the program seemed to be exceptionally enriched, especially for the older children. It was a comprehensive service, including medical care, with structured curricula in language, sensorimotor skills, perception, reading,

scientific and numerical concepts, music, art, and French.

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Insert Table 3 about here

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Data for a younger and probably slightly less disadvantaged group of Canadian children revealed significantly higher Developmental Quotients for day care children but they were in favor of children entering the center at 9 months rather than those beginning at 16 months (Fowler, 1974). The Canadian day care children also performed better on nonverbal problem-solving than on verbal items. Both Fowler and Caldwell, however, also found the performance of their day care groups was largely attributable to a decline in the scores of the home-reared children. The decline for Canadian children was between 11 and 25 months of age and between 12 and 30 months for the Syracuse population. Neither Keister nor Kagan found such drops for their samples. Kagan found little difference between day care and home-reared children but the day care group did perform better on nonlanguage items. Total cognitive development was significantly facilitated only for the working class Chinese. Conversely, Keister's middle class day care children both scored higher on the Bayley Mental Scale and exhibited a steeper slope of development.

Some cognitive effects of longer term day care for lower class 5-year olds who had attended the Syracuse Children's Center for an average of 43 months (Lindstrom & Tannenbaum, 1970). The day care children were significantly superior to a control group just beginning Head Start, on every measure of intellectual development.

On other variables which may be related to cognitive performance, Fowler's day care children who had attended the center 18 months improved

in ratings of verbal expressiveness, inquisitiveness, attentiveness, concentration, perseverance, sensitivity to stimulation and objects, directedness, attention span and endurance. MacRae and Herbert-Jackson, cited in Table 2, found caregivers rated middle class 2-year-olds who had attended day care over 1 year better at problem-solving, ability to abstract, and planfulness than peers in day care less than 6 months; but Schwarz, et al. (1974), found no differences on these same items between lower class 4-year-olds in day care for 3 years and age mates in their first year of center care.

#### Effects of Day Care Attendance on Children's Health

Another major concern of infant care has been the health of the children. Since babies are a physically vulnerable population and group care exposes them to many more potential pathogenic sources than home care, it was feared that day care infants would have more illnesses. Perhaps the most graphic expression of this concern came from the pediatric consultant for one of the earliest infant care programs who is reported to have said while inspecting the proposed facilities, "You know, I'm not at all sure this room will be adequate for Sick Bay. You realize, don't you, that there may be days when all the babies will have to be in Sick Bay?" (Keister, 1970a, 22). Fortunately, neither evidence from that particular center nor any other medical data collected has supported this prophecy.

The most comprehensive medical evaluation comes from children attending the Frank Porter Graham Center previously described in relation to Robinson's work (Loda, 1972; Loda, et al., 1972). (A summary of health-related research is given in Table 4.) In that program, children aged 6

weeks to 5 years were housed in mixed age groupings with those under 30 months, usually spending a portion of the day away from the older children. Daily records of health status for each child were maintained and ill children attended except for cases of measles and chicken pox. Sick children were seen by a nurse epidemiologist and/or pediatrician but they were not isolated from the group. All children with respiratory illness had throat cultures for viruses, mycoplasma, group A streptococci and either nasopharyngeal swabs for bacteria or nasal washings for viruses and bacteria.

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Insert Table 4 about here

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Analyses of data collected for 45 children from 29 different families over a 3-year period showed a mean incidence rate of 8.4 respiratory illnesses per child-year for the total group. Rates were highest for children under 1 (9.6 per child-year) and gradually decreased with age to 6.7 per child-year for 5-year-olds. Only one child was hospitalized for lower respiratory illness and that child was exposed at home, not at the day care center. There were no increases of nonrespiratory illnesses.

In respect to the patterns of respiratory illnesses, new viral agents were found to spread rapidly through the group and then disappear. There was little consistent seasonal variation within a year, although there were slightly fewer during summers. However, there were periods during the study in which more illnesses occurred than at other times. The highest monthly rate of incidence was 11 illnesses for 10 children and the lowest, 2 for 10.

With one exception, the authors indicated these results were similar to those for the same age group of home-reared children in two other studies.

Data gathered on the etiology of respiratory illnesses conducted at the same time in the same community showed the same viral causes of infection and seasonal variations and a similar age distribution of infection as was observed in the day care population. In comparison with the results of a 10-year study of middle-class, home-reared children in Cleveland, the North Carolina day care infants under 1 year of age had more respiratory illnesses, 10 compared with 8.3. Rates were fairly comparable for older children. The respiratory diseases of the day care children also were accompanied by fever nearly twice as often as those of the Cleveland sample. However, since the Cleveland data was based on children who were brought to the physician's office, and the day care children were regularly seen by medical personnel, it is unclear whether there was actually a greater frequency or whether the closer surveillance of the day care children resulted in the detection of more low-grade temperature elevations.

Loda (1972) has suggested that the Chapel Hill results may reflect the multi-age groupings and that the number of illnesses might be increased for infants and toddlers in homogeneous age groups. However, results from three other programs, all with children grouped according to age, correspond with the Chapel Hill data. Based on their impressions, Kearsley, et al. (1975), felt the incidence of respiratory illnesses of Chinese and Caucasian infants and toddlers from predominantly working class backgrounds, in the day care center studied was similar to that for the surrounding community.

Health data for children attending the Greensboro program were obtained through periodic pediatric examinations and from illness reports by parents and staff over a three-year period. Sick infants and toddlers were permitted to attend the center but were isolated in "Sick Day". Health care



was supervised by a pediatrician and the program paid "meticulous attention to staff health, handwashing, toy washing, floor cleaning, and other environmental safeguards" (Keister, 1970a, 22). Again, there were no more serious diseases among center children than for the home-bound. There were also no differences in height and weight. There were, however, significantly more minor illnesses, especially diaper rash, colds, and runny noses in the center children.— An interesting methodological problem also was reported which may account for the results. Initially, center health information was obtained from the nurse. However, it was found that mothers of day care children reported more illnesses than did the center nurse who examined the same children. Ironically, the center nurse whose own child was enrolled in the center also reported more illnesses for her child as a mother in the study than she did as the center nurse. Later center health data was based on staff observations. However, mothers continued to report more illnesses than did the staff for the same children.

Doyle (1975) collected illness data by telephone from parents for day care toddlers and a matched group of home-bound children over a two-month period. She found significantly more flu in center children. However, in view of the Chapel Hill results, these differences may be an artifact of the limited period of data collection. If the incidence of disease is no greater but merely spreads more quickly among children in group care, then it is possible that two months was not long enough to ascertain the true incidence in home-reared children.

### Discussion

The preponderance of available research revealed few differences between infants and toddlers attending group day care and peers who stayed

at home with their mothers. With limited exceptions, these differences were in favor of the day care children. The value of the research to date is this clear consensus that a priori day care is not harmful to young children. There are, however, limitations to the existing studies in conceptualization, methodology, and generalizability.

Effects on mother-child relationships have been the greatest concern about group care of very young children. The major theoretical issues relate to the development of attachment. At its broadest level, the research question has been whether or not there were any differences in attachment between day care and home-reared children. Of 9 studies of attachment, only 1 found significant negative effects for day care children. Blehar reported more crying, more oral behavior, and more avoidance and resistance of their mothers by the day care group. The explanation for the Blehar data is unclear since two replications of the design, one with same age children and the other with younger ones, have not confirmed her results.

Critical attachment variables suggested by Bowlby's ethological perspective involve the age of children in care, and the number and responsiveness of caregivers to individual children. Considering first the effects of age, enrollment during the time when attachments are being formed, between 6 and 30 months, should interfere with the development of mother-child attachment. Infants and toddlers in the studies reviewed entered group care between the ages of 6 weeks and approximately 34 months. Most researchers, however, did not consider age as a dependent variable. Two who did investigate age effects involved children with average ages of two years and over. One of these reported significant negative effects

for children who began day care at 26 and at 35 months of age. The other found no differences for similar aged children. A third report of a pilot study suggested an interaction between age of entry and amount of time spent each day in the center. Children who entered an infant center at 5 months and attended 8 hours a day had less positive reactions to aspects of the day care situation than children who entered at the same age but stayed only half days or other children who also attended all day but who began at a younger age.

These latter results and those from other studies in which no differences were reported for infants beginning care before 4 months of age support the hypothesis that group care is not disruptive to the mother-child relationship if it is begun before the onset of the attachment process. However, since these children do not show any differences in attachment to their mothers from home-reared children at any point over two years of care and periodic assessment, the cause appears to be more related to disruption in the process rather than to relationships with more than one caregiver. Though there may be a maximum number of people with whom young children can relate.

The adult-child ratio was either 1:3 or 1:4 in all studies except Keister and Blehar. Keister gave no exact figure but it appeared to be 1:4/5. Blehar, the only report of significant negative effects, also had centers with the highest number of children per adult, 1:6 and 1:8. This suggests some relation between the number of adults available and the effects on children; however, no day care study has experimentally tested this hypothesis.

In addition to the total number of caregivers, the number of different individuals relating to a child; the stability of the staff; and the quantity

and quality of interactions probably also influence the impacts. Such data was less frequently reported although several programs indicated consistent staff both in their assignment to individual children and for the duration of the projects. As is discussed later, such information is essential for relating care to outcomes for children.

While there is little data regarding the care actually provided for children in the centers studied, program descriptions imply excellent, individualized care. Limited data from 2 of the research programs suggest that the staff members are, indeed, responsive to individual children.

Based on observations over a 7-month period in the Cornell Infant Nursery, Johnston & Ricciuti (1974) found caregivers responded within 10 seconds to over 70% of infants' fussing or crying. In only 11% of the instances did it take staff longer than 30 seconds to attend to a child. Somewhat more indirect evidence comes from observations in the Syracuse program. Studying information processing, Honing, et al. (1970), found that 97% of the total information processing behavior transactions for 1- and 2-year-olds came from adults, implying that staff were available for supplying and responding to information exchanges. The proportion of a child's time spent in such interactions, however, was not reported.

Regardless of the number of caregivers or quality of interaction, there was consistent evidence that young children do not consider staff members the same as their mothers. When a choice was available between mothers and teachers, day care children overwhelmingly preferred their mothers. There was some indication, however, that day care children, especially infants with consistent, nurturant caregivers, are capable of forming multiple attachment relationships as indicated by positive greetings to caregivers, limited signs of distress at parental departure, and by the ability of the

caregiver to reduce distress in the mother's absence, thus supporting previous findings of multiple attachments of home-reared children (Schaffer & Emerson, 1964).

Although these results were not unanimous, they do suggest major revisions in Bowlby's constructs. Whatever the unique features of mother-child relationships are, they clearly were maintained even though children began group care as young as 2-3 months of age and were away from their mothers up to 40 hours a week during the first three years of life. Bonding either occurs much earlier in an infant's life, requires less continuous interaction, and/or is more adaptable than Bowlby has predicted. Considering the level and quality of interaction evidently present in most of the day care settings, the results suggest a conclusion similar to Schaffer's (1963). Based on work with hospitalized infants, he concluded that the amount of social stimulation may be more critical than the relationships with a single specific figure, although some opportunity for the latter is obviously essential.

The paucity of differences in attachment between home-bound and group care infants found to date does not necessarily mean there are no effects. Rather, it may reflect limitations in the conception and/or the measurement of attachment. The operational definition of attachment has been primarily the child's behavior in a strange and stressful situation and there is presently considerable controversy about the meaning of behaviors elicited by such procedures and their relation to mother-child attachment (Rheingold & Eckerman, 1973; Sroufe, 1977). Whatever this technique reveals about children's affective and/or cognitive development, it provides only limited data. It does not provide information about the interactive nature of a relationship or about affiliations with other family members.

There are also a whole range of other variables which need study and which may be related to attachment as well as other domains. Qualitative variables such as communication styles, language patterns, affect, control techniques, responsiveness, opportunities for exploration, stimulation, and learning environment all merit study in both homes and centers. Basic data about the amount and the quality of time spent with children by either mothers or other family members is unknown. The assumption that mothers remaining at home with their children have more or better interactions with their offspring than do parents of day care children is basically undocumented. In fact, cross-sectional data suggest that mothers at home were more emotionally involved with their babies, but they were also much more punitive than center caregivers and their children cried more.

And finally, in this reviewer's opinion, the framing of research questions primarily as predictions of negative outcomes from group care has severely limited the areas examined. Is there an optimal level of attachment? If centers provide for one-to-one relationships and appropriate, stimulating experiences, what are day care children gaining over home-bound?

One area in which center children have more opportunities than do home-bound children is for social interactions with nonfamily members. Contrary to expectations, day care children were consistently less interested in strange adults than were the home groups. It was unclear whether this was due to anxiety, either about strangers or their own attachment to their mothers, learned ability to play independently, or to limitations in the number of adults with whom children could or were interested in relating to.

Behavior with caregivers was less definitive. Infants with consistent caregivers seemed to establish some attachment to them but results from other studies ranged from no differences in the behavior of toddlers with

strangers and teachers to less cooperation with and more physical and verbal aggression expressed toward teachers by older preschoolers who had attended group care for several years. Some of these results may be explained by developmental differences in dependence on adults.

The presence or absence of attachment to caregivers may also reflect differences in relations with them. Unfortunately, none of the studies reported data on the quality or quantity of relationships with children and only a few gave information about the stability.

However, a follow-up study of London children who had been cared for by someone other than the mother for most of the day for at least one year during the first 3 years found boys to be more active, aggressive, and less concerned with parental approval and girls to want more attention (Moore, 1964). Increased negative interactions with adults have also been related to nursery school participation for older children in previous research (Raph, Thomas, Chess, & Korn, 1968). Further study is needed to determine the cause(s) of such behavior--whether it results from less parent or other adult interaction, or increased peer socialization.

Day care children of all ages generally interacted with peers although the nature of the encounters varied from positive to physical and verbal aggression. Babies as young as 6 months visually scrutinized other infants. One-year-olds made clear social overtures such as smiling or offering a toy and toddlers spent 25% of their time in active interaction with other children. Although this interest usually extended to strange peers, day care children clearly were more socially active with familiar classmates.

Since several of these studies of peer behavior included measures of mother-child attachment with no differences between home and day care children, it seems that peer interaction is not a substitute for poor or inadequate

parental attachment, but is rather an added benefit of the group setting. These are, however, based primarily on ratings, especially for the older children and to a larger extent involved children from only one day care setting. These results need to be replicated and refined with more data based designs. There are also other areas of development which merit investigation. The meaning of the one finding of increased aggression of older children with peers is unclear since it was not supported by a previous study of some of the same children nor by the Raph et al., data. It does raise some intriguing questions regarding the socialization of aggression since the peer groups have been found to be major contributors to its development (Hartup, 1977). Further study is needed to determine the validity of this outcome and, if so, to ascertain whether it represents accelerated or delayed social development.

In addition to offering unique opportunities for the investigation of the development of peer relations and the effects of age, composition, size, and stability on the children involved, there are other aspects of children's social and emotional development which merit study. Based on their work with day care centers, Prescott and Jones (1967) have suggested the possibility of adverse effects on the development of positive self concepts due to limited opportunities for privacy, for testing abilities and skills, for expression of strong emotions, and for successful management of unplanned events. They also raised intriguing questions about the knowledge day care children will gain about the adult world--activities and interactions, when children are confined to peer-oriented settings.

Infant and toddler day care also generally facilitated cognitive development especially for most lower and working class children.



In considering the effects on intellectual development of the age of the children when they began day care, children in all but one of these studies entered between 1 and 12 months of age. For younger, lower socioeconomic status children, day care enrollment helped them to maintain their developmental levels while the scores for their home-reared peers dropped between the ages of 12 and 30 months. It is, however, still possible for children starting day care later to make large gains on cognitive measures. The one group of lower class children who entered around age 2 had the greatest gains after 6 months-2 years in the program. This group also appeared to be the most disadvantaged of all those studied.

The effects of the length of enrollment were less evident since all children in these studies attended at least an average of 19 months. The greatest differences between the home reared control groups and day care children were for those who had been enrolled the longest.

There also may have been some differential effects of programs on intellectual development. Children in some day care centers performed better on verbal measures while children from others did better on nonverbal items. Although the content of most sounded similar, there were undoubtedly differences in the implementation. Some support for this conclusion comes from the Fowler program in which the largest proportion of teacher attention was directed toward problem-solving in visual-spatial skills, the area on which the day care children showed superior performance on the Griffiths DQ.

In regard to the health of children, the consensus of physicians associated with day care programs reported is that there are no serious medical consequences of day care if the center maintains adequate space, sanitation, staff, and medical supervision. Illnesses of children in day

care seem to parallel those in the community in which they live although infections spread more quickly in the group setting. There is, also, some strong indication that day care children, especially those under 1 year, have more minor respiratory illness but no more serious diseases than do home-bound infants and toddlers.

Since two programs admitted children who were ill with no adverse effects, serious doubt is raised about the current requirements for excluding most sick children from day care attendance. Personal observations suggest more sick children presently attend day care centers than are officially acknowledged. However, it would be worthwhile to systematically evaluate the effects on a broader scale and in programs with much less health consultation than the model centers studied. Data are needed regarding the care of sick children in group settings. What kind of care do sick children receive? What effect does this have on staff time and responsibilities for well children? How are prescriptive and other medications used with children?

Some of the more interesting questions suggested by this research relate to the operational definition of an adequate, safe and health environment and the interface with the provision of a stimulating program for young children. Very little information was available about the standards of health and safety actually met in the programs studied. How do health and sanitation standards affect outcomes for children? Do they influence the type and quality of play materials for infants and toddlers? How can children have experiences observing in the kitchen, preparing and serving food, setting tables, and cleaning up after themselves and still maintain a healthy environment? Are there relations between the health of the staff and that of the children?

What about accidents? Are particular types of injuries more apt to occur in groups than at home? What are children learning about health and safety?

There are also other aspects of physical well-being of children which have yet to be studied. Although there were no reports of the effects of nutritional aspects of child care, there is some indication that centers provide both better balanced meals and greater variety than do the low income families of the children (Rosenbluth, 1977). Data are needed for both consumption patterns and developmental outcomes. What are the effects of center snacks and meals on fatigue and energy levels, concentration, etc.? On continuing food habits?

In addition to the discussions of each content area, there are several other issues which generally apply to all of the day care studies. These relate to the methodology, conceptualization, and generalizability of the current research.

First, research questions have been formulated to identify differences between children attending group day care and those remaining at home with their mothers. Future research needs to be directed toward the greater refinement and specificity of the behaviors involved and causal relations.

Second, in regard to methodology, as most researchers acknowledged, studies of day care are not experimental. Although non-attenders were often carefully matched on several dimensions with day care children, they were not a single population randomly assigned to treatments. Consequently, it is impossible to make definitive statements about the effects of day care.

In addition, few measures are available for adequately evaluating the social-emotional development and for making fine discriminations in other areas for infants and toddlers. The most standardized measures, other than

the medical, were those for cognitive development. For other areas, researchers often devised instruments. Several studies of social-emotional behavior relied on ratings. Even in instances in which different studies used similar methodology, there were differences in techniques which may explain the results. Blehar and Ragozin, for example, both used the "strange situation" procedure but the former scored behaviors every 15" and also used global ratings while the latter used 6" intervals. Not only for the study of day care but for all research with infants and toddlers, effort must be directed towards developing valid standardized instruments and procedures for assessing all aspects of development.

Data frequently was collected in laboratory situations. Since it is known that behavior does vary with setting, Ragozin found little intra-individual consistency between attachment behaviors elicited in the experimental situation and those in the day care center, future study of the effects of group care must be based on evidence collected in appropriate settings.

Third, both home and group day care have been treated as single independent variables in all of the research. Virtually no information was reported about the care home-reared children received except when differences in care were the foci of the research, and only general statements about the centers. Yet, there are documented differences in the ways mothers and other family members interact with their infants and toddlers with diverse outcomes (Clarke-Stewart, 1973; White, et al., 1973). There was also some indication that variation existed among the programs studied, although there were a number of apparent commonalities.

Day care experiences must vary, too, for individual children depending on their ages, times of day, and total number of hours in group care and the

stability of arrangement. While children studied were generally those with stable attendance since several were longitudinal investigations, there is evidence that some children lack this continuity. Fowler reported a 25% drop-out rate and Saunders and Keister, 14%. As Winett, et al., have aptly stated, research questions must be rephrased as "What kinds of children from what kinds of families, in which kinds of child care settings behave and develop in what sorts of ways?" (1977, 156).

The final caution in the interpretation of this research is the relation between these results and the impacts of day care programs presently available to most families. Because of the similarity of many of the findings, it is questionable whether these results are as program specific as has been suggested (MacRae & Herbert-Jackson, 1976), or whether it is the quality of care which is critical.

Although, as discussed earlier in this review, little is known about the exact care provided. There were a number of dimensions which appeared to be common among centers in which research children were enrolled. Many of these variables have been considered indicators of good quality day care (Caldwell, 1973; Fitzsimmons & Rowe, 1971). They were:

Staff: Personnel were carefully selected and there seemed to be little staff turnover. Programs were planned and supervised by persons with advanced degrees in child development or related fields. Although the staff caring for the children usually were paid minimum wage and had no specific training for working with infants and toddlers, they were primarily middle class women with some college, with previous experience with young children, and an ability to interact warmly and responsively with individual children. Projects also provided considerable pre- or in-service training and other opportunities for staff

communication. It is also expected that most staff members were motivated by being involved in an experimental program which offered stimulation well above that in typical day care centers.

Regular services of pediatricians, social workers, and other auxiliary professionals were often included in the programs.

Population: Again, as was discussed in regard to attachment, the caregiver-child ratio was 1:3/4 for infants with slight increases for toddlers. The total number of children enrolled in most of the centers was 30-40, with stable populations of both children and staff throughout the period of the studies. Usually 15-20 was the maximum infant or toddler group size.

Curriculum Content and Methods: All programs emphasized responsive, individual child-caregiver relationships within a developmentally appropriate and stimulating environment. Programs usually had some articulated conceptual orientation and guidelines within which daily activities were planned and carried out. "Activities" included both a high level of adult-child verbal interactions and the availability of a reasonable quantity of interesting play materials.

Health and Sanitation: Children were cared for in clean, safe surroundings with continuing health surveillance. Good sanitation practices were employed both in relation to food handling and child care. Most centers employed nurses and/or pediatric consultants who established health policies, regularly reviewed the physical well-being of the children, and supervised the health practices of the program. Illnesses were recognized and treated appropriately. Staff maintained regular communication with parents about children's health.

Also, children in most programs spent a portion of the day playing out of doors.

Space and Facilities: Although most programs indicated the need for improvements in facilities, location, or arrangement of available space, there was usually more than minimal play space, both indoors and outside. They were mostly located at ground level, usually with easy access. Surroundings were kept clean, attractive, and inviting for both children and adults. The organization of the space and the equipment available were designed to facilitate the provision of good child care.

There is no systematic data about infant-toddler programs available to the public but there is little reason to expect the quality to differ from that of existing day care for 3- to 5-year-olds. The limited information about preschool centers suggests few provide the quality of care found in the research programs.

In a 1970 survey of a national, cross-section sample of 289 centers, about one-quarter of these centers were providing custodial care (Day Care Survey - 1970). Custodial care in this instance was defined as offering "food, shelter, and adult supervision, but makes no attempt to provide education, or other services such as health care or family counseling" (Ibid., 8). The label was not intended to convey program quality; however, the profile of custodial centers suggests limited supplies and equipment, no written schedules, high adult-child ratios, and few trained staff.

Approximately half of the centers in the sample provided "some kind of educational program". The remaining 25% included both educational and other services such as health care, parent participation, counseling, etc.

The provision of custodial, education, or developmental services was closely related to program sponsorship. Over three-fourths of all

custodial centers were proprietary but only 17% of those categorized as developmental were. For the entire sample, proprietary programs accounted for 58% of the total number of centers and provided care for about half of the children in day care centers.

In a second study of quality, The National Council of Jewish Women assessed 431 centers throughout the country (Keyserling, 1970). Members visited programs and administered a standardized interview to selected staff members. All the information collected was used in making global ratings of quality. Data included adult-child ratios, size of groups, staff training, staff salaries, educational and other services provided, hours of center operation, parent involvement, and interviewers' impressions of space, facility, and equipment, and quality of care. Poor care was found in 51% of the proprietary programs and only fair care was being given in an additional 35%. Nonprofit programs were providing somewhat better care, with 40% rated good to superior. Still, 50% of these centers were providing only fair care. The observations of Rubenstein and Howes in five community centers suggested infant programs of quality, yet anecdotal observations in urban and rural infant centers in a large, midwestern state (Weir, 1973) revealed poor infant care. During visits to 6 different programs to gather data about caregiver language, child care staff were observed to be unresponsive to the children's needs and to have many directive or restrictive interactions. Staff members provided few interesting activities, often ignored children and talked with other adults, listened to radios or engaged in clean-up, housekeeping, and other maintenance tasks. Supplies and equipment were inadequate. The facilities for two of the six centers were not conducive for good programming. One center director is reported to have indicated to the observer that she hoped the program wasn't being observed because "...with this age group



(3 months-3 years) it's not possible to have to have a program" (Ibid., 104).

In conclusion, research to date has revealed few significant differences between infants and toddlers cared for in group day care and those reared exclusively by their mothers. Although the range of developmental domains have been studied, only a limited number of issues have been examined. Research questions have been global, directed primarily at the identification of differences between the two groups and the children studied were attending primarily University-affiliated programs with high adult-child ratios, selected staff, and planned, articulated philosophies and curricula. It seems time to move on to more refined hypotheses which reflect the range of children, families, programs, and developmental phenomena available in day care settings.

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Table 1

## Summary of Research Regarding Attachment Behavior of Infants and Toddlers in Group Day Care

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Keister, 1970 a; b	14 Day Care (DC) matched with 14 Home- Reared (HR) for sex, race, age, education of parents and birth order when possible.  Most middle class.	6-9 hr./da. total. Length of attendance not re- ported. Could be enrolled at 3 mo. Some children in DC for 21 mo.  Demonstration project for group care of infants.  <u>Adult-Child Ratio:</u> Est. 1:4/5.  <u>Enrollment:</u> 31 3mo.-3 yr.  <u>Staff:</u> All have children; mini- mum high school education; 20-55 yr. old.  <u>Program:</u> Modeled on good M.C. home care; small group; age- appropriate, challenging play; Individual attention; continu- ity and consistency.	Repeated measures at 3, 6, 9, 12, 18, 24, 30, 36, 42, & 48 mo. of age.  Preschool Attainment Record (PAR).  Vineland Social Maturity Scale.  Readiness to separate from mother.  Assertiveness.	(Analysis for differences between initial and final measures only.)  DC steeper slope of development, for PAR only significant differ- ence on social-emotional meas- ures.
Caldwell, et al., 1970	18 DC; 23 HR.  All 30 mo. old.  Caucasian and Black.  Mostly LSES (groups not matched).	6-9 hr./da. $\bar{X}$ attendance = 18.8 mo. Range = 5-24 mo.; most en- rolled prior to 12 mo.  Syracuse Demonstration Center.  <u>Adult-Child Ratio:</u> 1:4 under 3 yr.  <u>Enrollment:</u> 65-70 6 mo.-5 yr.  <u>Program:</u> "...atmosphere in which people & objects give proper lev- el of stimulation in context of emotional warmth, trust & enjoy- ment" (402).  20 min. Individual attention to each child daily.	Ratings of attachment be- haviors (affiliation, nur- turance, hostility, permis- siveness, dependency, hap- piness, and emotionality) for both child and mother based on observations of semi-structured interview with mother and child.	DC children more dependent.  DC mothers less permissive.  No difference in other attach- ment ratings.

Table 1

## Summary of Research Regarding Attachment Behavior of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Kearsley, et al., 1975	24 DC 3½-20 mo.; 28 HR 3½-20 mo.  Raised exclusively at home. Matched for age, sex, ordinal po- sition, family back- ground.  All 1st or 2nd born; full-term preg. & delivery; free of physical abnormalli- ties.  Predominantly work- ing class.  94% stable nuclear families.  Approx. 50% Chinese; 50% Caucasian.	Began DC at 3½ mo. Min. 4 hr./ da./5. da./wk.  <u>Adult-Child Ratio:</u> 1:3 infants; 1:5 toddlers. Children assigned to specific caregivers.  <u>Capacity:</u> 15 infants; 20 tod- dlers.  <u>Staff:</u> Mature women from com- munity, all mothers; stable dur- ing study.  <u>Program:</u> Emphasized importance of individualized social inter- action.	Observation of separation behavior at 3½, 5½, 7½, 9½, 11½, 13½, and 20 mo.  Separation situation: Child playing contentedly with toys; mother says "Bye-bye", leaves.  Observed 2 min. or termin- ated after 15 seconds crying or fretting.	Age only significant result.  Marked increases in protest at 9½ and 11½; levels off at 20 months.  Protest representative of total group, not few extreme cases.
Kagan, et al., 1977	33 DC 3½-30 mo.; 63 HR 3½-30 mo.  Approx. 50% both groups Chinese, 50% Caucasian; 50% working class, 50% middle class.  (Some children same as those reported by Kearsley, et al.)	Same as Kearsley, et al.  <u>Program:</u> Middle class bias in curriculum; encouraged cognitive development; 1-1 affective inter- actions between child and care- giver; maximized opportunity for successful mastery experiences.	Assessment batteries at 3½, 5½, 7½, 9½, 11½, 13½, 20, 29 mo. of age.  20 mo. social-emotional measures. Solo free play*; peer play*; attachment; & separation (same as Kears- ley, et al.).  29 mo. social-emotional measures.  *Same as 20 mo.; visit to unfamiliar day care center.	Results reported only for 20 and 29 mo. assessments.  Little difference between HR & DC.  DC less vigilant & less inhibited in behavior with unfamiliar peers.  Working class DC Chinese less ap- prehensive in unfamiliar situa- tion.



Table 1

## Summary of Research Regarding Attachment Behavior of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Ricciuti, 1974 (Study B)	12-13 mo. old; 5 full day; 4 half day; matched with HR.  No background data reported.	Entered DC 2-6 mo. old; 7-10 mo. in DC.  <u>Adult-Child Ratio:</u> 1:3.  <u>Staff:</u> Same 2 female caregivers throughout year.  <u>Program:</u> Individualized, warm, affectionate care with staff continuity.  Balance of consistency & variety in both caregiving practices and physical environment.  Responsive environment so baby can exercise some control and learn that learning is pleas- urable.	"Strange situation" para- digm with child with mother and/or with stranger.  Ratings of responses to different approaches of stranger (slow, quick) at different points in test- ing session.  Independent ratings by 2 ob- servers every 10"-12" of visual & manipulative-pos- tural directionality and affectivity.	No difference between DC & HR in response to stranger with mother present. Reactions to stranger more negative in moth- er's absence.
Ricciuti, 1974 (Study D)	Same as above & 1973 study children. Matched HR controls. Range = 12-19 mo. old. $\bar{X}$ = 16 mo. 1974 children range = 12-13 mo.; $\bar{X}$ = 12.5 mos.	Entered DC 2-6 mo. old; 7-10 mo. in DC.  No information re: day care ex- perience after 13 mos. of age.  <u>Adult-Child Ratio:</u> Ratio and program same as above.	Variation of "strange situa- tion" paradigm. Ratings of child's responses to enter- ing large playroom with mother where teacher & 3-4 children are seated at ta- ble.  Variables were distance from and physical contact with mother; maintenance of dis- tance during mother's ab- sence; visual orientation to mother & children; & gener- al affective state.	DC farther from mother and clos- er to children; less sustained physical contact and less active looking at mother. More time looking at children.

Table 1

## Summary of Research Regarding Attachment Behavior of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Blehar, 1974	<p>20 DC; 20 HR. Age younger group <math>\bar{X}</math> = 30.2 mo.; older <math>\bar{X}</math> = 39.6 mo. at time of study.</p> <p>All H.C.; 2 parent families; all but 1 Caucasian; 80% DC, 60% HR were first- born.</p> <p>3 HR = 40 mo. Attended nursery school 2-3 mornings/ wk.</p>	<p>10 entered DC at <math>\bar{X}</math> = 25.7 mo.; 10 entered at <math>\bar{X}</math> = 34.8 mo. <math>\bar{X}</math> DC attendance = 4.6 mo. (4 DC children had been cared for by babysitter 4 mo. before group care.)</p> <p>Children enrolled in 4 different private centers.</p> <p><u>Adult-Child Ratio:</u> 1:6; 1:8.</p> <p><u>Program:</u> "Traditional nursery school regimes with little em- phasis on structural academic programs" (685).</p> <p>Children segregated into age groups.</p>	<p>Home visit with mother &amp; child immediately after which visitor rated on Cald- well Inventory of Home Stim- ulation &amp; Q-sort for mother's empathy/social sensitivity.</p> <p>Ainsworth &amp; Bell "Strange Situation" procedure with continuous descriptions of child's behavior recorded. Measures were 15" frequency counts of exploratory ma- nipulation, oral behavior, and distance interaction with mother. Rating of so- cial interaction scores for seeking, avoiding &amp; prox- imity &amp; contact &amp; social interaction.</p>	<p>No difference between DC &amp; HR on Home Stimulation or empathy.</p> <p>DC cried more; engaged in more oral behavior in absence of moth- er with stranger present; re- sisted and avoided mother more.</p> <p>HR interacted more with mother across distance and maintained closer proximity to stranger.</p> <p>Age group interactions with old- est DC lowest in exploration and doing most searching for mother during her absence.</p> <p>Age group episode interaction showed older DC engaged in more proximity seeking after first separation from mother and young- est HR most proximity seeking af- ter second separation from mother.</p>

Table 1

## Summary of Research Regarding Attachment Behavior of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Ragozin, 1975, n.d.	14 DC: 5 = 17-29 mo. 9 = 30-38 mo. old.  DC matched with HR. All from intact, 2- parent families; mother well-educated. $\bar{X}$ = 17 yr. education. 75% mothers were full time students.	At least 4 mo. in DC. 2 centers: both high quality, 1 private non- profit, low-budget; 1 model Uni- versity center.  <u>Adult-Child Ratio:</u> 1:4.  <u>Program:</u> No information reported.	Strange situation procedure similar to Ainsworth. 2 ob- servers recorded different aspects of children's behav- ior at 6" intervals.  Variables: child-initiated distance (more than 3 ft.) between members of dyad; child-initiated proximity; touching; giving/taking ob- jects; communicating; re- sisting proximity; play; locomotion; crying; and proximity seeking during mother's absence.	No differences for play & locomo- tion; calling for & passively maintaining proximity to absent mother; touching; communicating with and total distance from mother when she was present.  DC created and maintained dis- tance from mother at signifi- cantly higher rates. No differ- ence in total distance.  Younger DC initiated more prox- imity.  DC engaged in less give/take of objects with stranger.
Doyle, 1974, 1975	12 Canadian DC matched with HR for age; sex; parental education, occupation & age; no. siblings.  Age $\bar{X}$ = 18.5 mo.; Range = 5-30 mo.  10 male; 14 female.  Most middle class. All Caucasian, Anglo- phile.	$\bar{X}$ = 7 mo. attendance.  Newly established center.  <u>Adult-Child Ratio:</u> 1:4.  <u>Enrollment:</u> 45 total; 20 under 2½.  <u>Program:</u> Balance free play and structured group activities.  Each child assigned to a primary caretaker who spent at least 15 min./da. in 1:1 play.	Attachment; Ainsworth & Bell "strange situation" procedure.	HR looked more at stranger when she first entered room.  No evidence of weakened or in- secure attachment.

Table 1

## Summary of Research Regarding Attachment Behavior of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Ricciuti, 1974; (Study A)	12-13 mo. old; 8 male, 2 female..  No background data reported.	Entered DC 2-3½ mo. old; re- mained approx. 10 mo.; 4 hr./ da./5 da./wk.  <u>Adult-Child Ratio: 1:3.</u>  <u>Staff:</u> Same 2 female caregivers throughout year.  <u>Program:</u> Individualized, warm, affectionate care with staff con- tinuity.  Balance of consistency & variety in both caregiving practices and physical environment.  Responsive environment so baby can exercise some control and learn that learning is pleasur- able.	Monthly assessment completed on 2 separate days, once with caregiver 1st and once with stranger 1st.  "Strange situation" paradigm with child & mother alone and with caregiver or stranger; child alone with caregiver, stranger.  Independent ratings by 2 ob- servers every 10"-12" of vis- ual & manipulative-postural directionality & affectivity.	Up to 7 mo., same responses (generally positive) to both caregiver & stranger. Beginning at 8 mo., positive responsive to caregiver cont'd., responses to stranger, less positive.  Absence of general negative re- sponse to strangers. With moth- er present but did become less positive after 7 mo. Consider- able variability among child- ren.  More negative affective respon- ses to stranger in mother's ab- sence. Approach of caregiver in- creased positive affect before 7 mo. and reduced distress af- ter 7 mo.  Beginning at 6-7 mo., similar distress at being left with stranger by either mother or fam- iliar caregiver.  Being left alone with caregiver produced little or no distress until 12 mo. Distress then less than being left with stranger.

Table 1

## Summary of Research Regarding Attachment Behavior of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Farran & Ramey, 1977	23 9-31 mo. LSES.	Began DC 6-12 wk. of age. 7 hr./da./5 da./wk.  No information reported regard- ing care.	Child observed in laboratory with mother, teacher, male stranger. Child given task which requires help.  Variables: time spent in various areas; use of toys; physical contact; behavior with item requiring assis- tance.  Home observation for meas- urement of the environment completed for all at 6 mo. of age.	17 or 23 children moved to moth- er's side when placed in experi- mental room.  Children spent more time in mother's side of room, engaged in more interactive behavior with mother, and sought help only from mother.  No difference in interactions with teacher and stranger. Great variability in behavior among children. Not related to age, sex, or I.Q.  Maternal involvement scale of HOME positively related to frequency of child's visits to teacher's side of the room and negatively related to contacts and time spent with mother.  Mothers rated as punitive at 6 mo. were less apt to have toys extended to them.

Table 1

## Summary of Research Regarding Attachment Behavior of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Ragozin, 1975	20 DC; Sample divided into 2 groups. $\bar{X}$ = 24 mo. Range = 17-29 mo. $\bar{X}$ = 34 mo. Range = 30-38 mo.  Exact numbers not re- ported.  2-parent families; mother well-educated, all but 1 had some college. $\bar{X}$ = 17 yr. education. 75% mothers were full-time stud- ents.	At least 4 mo. in DC. Enrolled full-time. 2 high-quality cen- ters: 1 private nonprofit, low- budget; 1 model University cen- ter.  <u>Adult-Child Ratio:</u> 1:4.  <u>Program:</u> No information re- ported.	Observed arrival, separa- tion, mother's absence, and reunion.  Variables: proximity, ex- ploratory behavior; distress; and peer-directed behavior.	No age effects. Wide individual differences.  Increased proximity to mother; child-initiated proximity, touch and communication with mother during reunions.  When both mother and teacher were present, children stayed closer to mothers, touched, fol- lowed and communicated more with them.  Comparisons with strange situa- tion results revealed little intra-individual consistency.
Willis & Ricciuti, 1974	10 DC (7 male, 3 fe- male).  M.C. working parents or students.	Began DC 2-6 mo. old. 6 attended 8 hr./da./5 da./wk. 4 attended 4 hr./da./5 da./wk.  <u>Adult-Child Ratio:</u> 1:4.  <u>Staff:</u> 3 different caregivers with 2 present at all times.	Observations of daily ar- rival & departure twice per week for 7 mo.  Began after all babies had been in program at least 2 mo.  Standardized procedure for arrivals: parent removes out- side o	No statistical analyses.  Children less positive about parent's departure.  4 hr. most positive affective re- sponse to caretaker's greeting.  Older 8 hr. consistently least positive to both caretaker's greeting & parent leaving.  All clearly positive affective responses to parent's arrival at end of day. Developmental change at 12-13 mo. with children less apt to want to leave center.

Table 1

## Summary of Research Regarding Attachment Behavior of Infants and Toddlers In Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Dietmann, 1967	5 infants in each: own home, day home, group care. Matched for age, sex & socio- economic status of caretaker; education of caretaker primar- ily high school or less.  $\bar{X}$ -age = 9 mo.; Range = 6-11 mo.  Babies - all Caucas- ian;	Group care provided commercially by private individuals.  <u>Adult-Child Ratio:</u> Varied in all settings.  "Probably, all three of the set- tings...were frankly custodial in nature..." (109).	4 morning hr. of time sample observation of 10 variables for each child: infant's lo- cation, state, posture, ac- tivity; caretaker's proxim- ity, verbal behavior; rou- tine and affectional activ- ities; number of different caregivers; number of adults and number of children with- in 6 ft.	General patterning of infants' activities, motor behavior, and routine care was similar for all.  DC babies more apt to be con- fined to crib or play pen.  Group DC cared for by more dif- ferent people, more rarely isolat- ed from other children and more frequently within 6 ft. of 2 other children.  Little difference between group and family day care.  Mothers more "affectional", both positive & negative interactions.
Ruben- stein & Howes, 1976	15 DC full term, normal, healthy.  Caucasian.  Age = 17-20 mo.  Matched with HR for sex, age, ordinal po- sition, parents' ed- ucation & religion.	$\bar{X}$ = 4.7 mo.  5 different centers.  <u>Adult-Child Ratio:</u> 1:4.  <u>Program:</u> Mostly "free play".  No other information reported.	2-2½ hr. observations of each infant during normal activities of discrete be- haviors & sequences occur- ring in time unit.	No difference in amount of time (50%) spent in positive interac- tion with adult or number of in- teractions initiated by child or adults; total amount of adult verbal interaction; nonrestrict- ive adult speech; or frequency of child-initiated exchanges.  DC more adult-infant play; goal play; sharing of objects with adults; positive response of adult to sharing; reciprocal smiling; and adult noncaretaking touching.  HR cried more & responded more to mothers' talking.  Adults at home were 4 times more restrictive.

Table 2

## Summary of Research Regarding Other Social Interactions of Children in Infant and/or Toddler Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Durfee & Lee, 1973	7 male; 2 female. Age = 6-9 mo. at be- ginning of study.	Enrolled in DC approximately 5 mo. at beginning of study.	Observed approximately 1 hr/day/6 mo. Recorded as many complete encounters as possible.	Encounters are complex, with de- velopmental changes in modes of encounter and babies taking dif- ferent roles in relation to con- tact.  Infant-Infant encounters incor- porated both social and non- social components.  Wide individual differences.
Ruben- stein & Howes, 1976	15 DC full term, normal, healthy.  Caucasian.  Age = 17-20 mo.  Matched with HR for sex, age, ordinal position, parents' education & religion.	$\bar{X}$ = 4.7 mo.  5 different centers.  Adult-Child Ratio: 1:4  Program: Mostly "free play".  No other information re- ported.	2-2½ hour observations of each infant during normal activities of discrete be- haviors & sequences occur- ring in time unit.	DC spent 25% of time in active interaction (talking to, smiling at, touching, imitating, exchang- ing or sharing objects) with other children.  1% of peer interactive time spent in conflict. 13% in mutual in- volvement in activities or in ac- tivities in which there was mutu- al awareness of or reciprocal re- sponding to each other.  Developmental level of play with inanimate objects higher when in- fant was interacting with peers.



Table 2

## Summary of Research Regarding Other Social Interactions of Children in Infant and/or Toddler Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Doyle, 1974, 1975	12 Canadian DC matched with HR in age; sex; parental education, occupation & age; no. siblings.  Age $\bar{X}$ = 18.5 mo. Range = 5-30 mo.  10 male; 14 female.  Most middle class. All Caucasian, Anglo- phile.	$\bar{X}$ = 7 mo. attendance.  Newly established center.  <u>Adult-Child Ratio:</u> 1:4.  <u>Enrollment:</u> 45 total; 20 under 2½.  <u>Program:</u> Balance free play and structured group activities.  Each child assigned to a primary caretaker who spent at least 15 min./da. in 1:1 play.	Peer interaction: 10 min. video tape sample. HR-DC pairs playing in room with toys with mothers at edge of room.  Scored every 10" for type, tone, and target of behav- ior; duration; reaction to friendly and aggressive be- haviors.	DC Initiated fewer social inter- actions, both positive & negative.
Kagan, et al., 1977	33 DC 3½-30 mo.; 63 HR 3½-30 mo.  Approx. 50% both groups Chinese, 50% Caucasian; 50% working class; 50% middle class.  (Some children same as those reported by Kearsley, et al.)	Same as Kearsley, et al.  <u>Program:</u> Middle class bias in curriculum; encouraged cognitive development; 1:1 affective in- teractions between child & care- giver; 1-2 hr./da. of interac- tion; maximized opportunity for successful mastery experiences.  Each child had primary caregiv- er, usually same ethnicity; changed after 13 mo.	Assessment batteries at 3½, 5½, 7½, 9½, 11½, 13½, 20, & 29 mo. of age.  20 mo. social-emotional measures: Solo free play*; peer play*; attachment; & separation (same as Kears- ley, et al.).  29 mo. social-emotional measures: Solo free play*; peer play*; separation*; visit to unfamiliar day care center.  *Same as 20 mo.	(Results reported only for 20 and 29 mo. assessments.)  Little difference between HR & DC.  DC less vigilant & less inhibited in behavior with unfamiliar peers.  Working class DC Chinese less apprehensive in unfamiliar situ- ation.

Table 2-

Summary of Research Regarding Other Social Interactions of Children in Infant and/or Toddler Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
MacRae & Herbert- Jackson, 1976	8 pairs of 2-yr.- olds matched on age & sex.  Parental occupations ranged from manual laborer to college professor with student - the most frequent occupation.	$\frac{1}{2}$ attended DC at least 13 mo.; $\frac{1}{2}$ attended DC 1-6 mo.  No other information reported.	Caregivers rated children on 7-point scales for tol- erance for frustration; co- operation with adults; com- patibility with peers; spontaneity; physical & verbal aggression; motor ac- tivity; problem-solving; playfulness; ability to ab- stract.	"Old" DC rated better on ability to get along with peers, prob- lem-solving, ability to abstract and planfulness.
Schwarz, et al., 1973	16 DC matched for age, sex, race, par- ental occupation & education with 16 children with no previous group day care care. (Some had been cared for by others at home, babysit- ters.)  DC $\bar{X}$ = 3 yr. 10 mo. HR $\bar{X}$ = 3 yr. 6 mo.	Attended Synagogue Children's Center, 6-8 hr./da./5 da./ wk. $\bar{X}$ = 36 mo. (Range = 24-47 mo.)	All children observed and rated on 1st day attendance in new DC program for: 1) Affect 2) Tension 3) Social Interaction  Follow-up rating 5 wk. lat- er.	DC rated more positive affect up- on arrival; no difference later in 1st day or at 5 weeks.  No difference in tension.  DC engaged in more social inter- action initially & showed great- er increase over time.
Lay & Meyer, 1971	19 matched pairs; 1 unmatched pair.  Most children same as Schwarz et al., 1971.  $\bar{X}$ age = 3.95 yr. both groups at beginning of study.	Approx. same as Schwarz, et al., 1973.	Observed patterns of behav- ior in open environment for: 1) children's choice of play locations 2) interactions with peers 3) interactions with adults  Observed over 7 mo. period; Point-time sampling.  Total = 8264 min. observa- tion.	DC played more in active area; less in expressive & task- oriented areas.  DC more verbal interaction with peers; more positive verbal in- teraction with peers; more in- teraction with other DC peers.  No difference in snack, invita- tional, outdoor play, gestural or tactile interaction or inter- action with adults. 69

Table 2

## Summary of Research Regarding Other Social Interactions of Children in Infant and/or Toddler Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Schwarz, et al., 1974	Same as Lay & Meyer. 19 matched pairs.	Approx. same as Schwarz, et al., 1973.	Children rated on 9 bipolar trait scales: tolerance for frustration; compatibility with peers; spontaneity; physical & verbal aggression; motor activity; problem-solving; playfulness; ability to abstract.  Rated after 4 mo. by 9 teachers. Rated after 8 mo. by 4 observers.	DC less cooperative with adults; more physically & verbally aggressive with peers & adults; more motor activity.  No difference on other traits.

Table 3

## Summary of Research Regarding Cognitive Development of Infants and Toddlers in Group Day Care

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Robinson & Robin- son, 1971	<p>31 children, 19 in- fants selected before birth. Roughly bal- anced for sex and race. No gross anom- alies; 12 toddlers.</p> <p>24 different fami- lies; 15 Caucasian middle class child- ren, 16 Black, mostly low income.</p> <p>2 control groups: 1 followed from infan- cy; other used for preschool comparison only.</p>	<p>Infants entered DC between 4 wk. -6 mo. of age. Toddlers entered 23-36 mo. Attended up to 2½ yr.</p> <p><u>Program:</u> Comprehensive &amp; Univer- sity sponsored. Stimulating, in- cluded health care, structured educational program with curric- ula in language, sensorimotor skills, perception, reading, sci- entific and numerical concepts, music, art, French.</p> <p>Children housed in multi-age groups of up to 16 total. Child- ren from same families, housed to- gether.</p> <p>Child-focused work with parents through daily conversations with staff, contacts with pediatri- cian and home visits by public health nurse.</p>	<p>Infants tested every 3 mo. to 18 mo. of age with Bay- ley Infant Scale.</p> <p>Toddlers tested every 6 mo. ages 2½-4½ with Stanford- Binet; Peabody Picture Vo- cabulary; Illinois Test of Psycholinguistic Abilities; Arthur, Adaptation of Reiter Scale; Draw-a-Man.</p> <p>1st 16 children and centers also tested at age 4 with Wechsler Primary and Pre- school Inventory; Frostig Test of Visual Perception; Caldwell Preschool Inventory.</p>	<p>DC infants higher on Bayley Men- tal &amp; Motor Scales. Difference over time only for Mental Scale, especially at 18 mo. when con- trol group dropped.</p> <p>DC consistently higher scores on verbal tasks than sensorimotor.</p> <p>Older Black DC toddlers higher on Stanford-Binet. (PPVT).</p> <p>No differences reported for other measures.</p>

Table 3

## Summary of Research Regarding Cognitive Development of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Fowler, 1974	<p>Urban, Canadian children attending community center. N varies; maximum = 24.</p> <p>Largely single parent, multi-ethnic, factory working class to skilled blue collar &amp; clerical.</p> <p>Matched comparison groups on basis of age; sex; IQ; parent education, ethnicity, occupation; sibling number, spacing &amp; parental age as feasible.</p> <p>Controls reared at home by parents or babysitters.</p>	<p>Minimum admission age = 6 mo. All day attendance up to 21 mo. in center.</p> <p>Adult-Child Ratio: 1:2.5 infants; 1:5.6 toddlers; 1:9 preschool.</p> <p>Program: Community center. Curriculum designed to further child's development of cognition, language, gross &amp; fine perceptual motor processes, motivation &amp; socioemotional functioning, physical health &amp; development. Learning experiences center around developmental care routines, play and guided learning.</p> <p>Parent guidance through demonstration of guided learning--play interaction techniques discussion of child-rearing, toy lending library, home visits and parent meetings.</p>	<p>Measures administered at entry and 6 mo. intervals. Griffiths Scales of Mental Development (GQ); Bayley Infant Behavior Record; Schaffer &amp; Aaronson Infant Behavior Inventory; Caldwell Home Stimulation Inventory; Schaffer &amp; Aaronson Infant Education-Research Inventory.</p> <p>Assessment of maternal abilities, Wechsler Scale of Adult Intelligence.</p>	<p>(Results for 1st 2 yr. of project.)</p> <p>DC &amp; HR GQ same at 11 mo. DC total GQ and nonverbal problem-solving subtest higher after 14 mo. in program. Gains for children entering at 9 mo. greater than for those entering at 16 mo.</p> <p>Except for problem-solving, group differences largely a function of declines of HR.</p> <p>After 18 mo. in center, DC gained on ratings of verbal expressiveness, inquisitiveness, attentiveness, concentration, perseverance, sensitivity to stimulation &amp; objects, goal directedness, attention span, and endurance.</p> <p>(Significance level not reported. No data for HR.)</p> <p>DC girls decline in fine motor skills, gain more than DC boys on curiosity-exploratory, concentration, perseverance, verbal expression, lack of irritability, enthusiasm.</p> <p>DC better than HR on emotional and verbal responsiveness of mother and maternal involvement with child.</p>

Table 3

## Summary of Research Regarding Cognitive Development of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Kagan, et al., 1977	33 DC 3½-30 mo. 63 HR 3½-30 mo.  Approx. ½ both groups Chinese, ½ Caucasian, ½ working class, ½ middle class.	Same as Kearsley, et al.  <u>Program:</u> Middle class bias in curriculum; encouraged cognitive development; 1-1 affective in- teractions between child and caregiver; maximized opportunity for successful mastery experi- ences.	Assessment batteries at ages 3½, 5½, 7½, 9½, 11½, 13½, 20, & 29 mo.  20 mo. measures: Vocabulary recognition; age-appropriate Bayley Infant Scale items.  29 mo. measures: Concept Fa- miliarity Index; Embedded Figures Task; Memory for Lo- cations Task.	Results reported only for 20 & 29 mo. assessments.  Little difference between HR & DC.  DC higher on nonlanguage Bayley items.  Facilitated cognitive develop- ment for working class Chinese DC.
Caldwell, et al., 1970	18 DC; 23 HR.  All 30 mo. old.  Caucasian and Black.  Mostly LSES (gro- not matched).	6-9 hr./da. $\bar{X}$ attendance = 18.8 mo. Range = 5-24 mo.; most en- rolled prior to 12 mo.  Syracuse Demonstration Center.  <u>Adult-Child Ratio:</u> 1:4 under 3 yr.  <u>Enrollment:</u> 65-70 6 mo.-5 yr.  <u>Program:</u> "...atmosphere in which people & objects give proper lev- els of stimulation in context of emotional warmth, trust & enjoy- ment" (402).  20 min. individual attention to each child daily.	Stanford-Binet or Cattell Infant Intelligence Scale (DQ).  Home visit to complete In- ventory of Home Stimulation.	HR higher DQ at 12 mo. No differ- ence at 30 mo. due to drop in HR DQ.  No difference on Home Stimulation  Positive relation between DQ and Home Stimulation for HR only.

Table 3

## Summary of Research Regarding Cognitive Development of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Keister, 1970 a, b	14 DC matched with 14 HR for sex, race, age, education of par- ents & birth order when possible.  Most middle class.	6-9 hr./da. total. Length of at- tendance not reported. Could be enrolled at 3 mo. Some children in DC for 21 mo.  Demonstration project for group care of infants.  <u>Adult-Child Ratio:</u> Est. 1:4/5.  <u>Enrollment:</u> 31 3 mo.-3 yr.  <u>Staff:</u> All have children; min- imum high school education; 20-25 yr. old.  <u>Program:</u> Modeled on good M.C. home care; small group; age-ap- propriate, challenging play; in- dividual attention; continuity and consistency.	Repeated measures at 3, 6, 9, 12, 18, 24, 30, 36, 42 and 48 mo. of age.  Bayley Infant Scales or Stanford-Binet.	(Analysis for differences be- tween initial and final measures only.)  DC higher on Bayley Mental Scale.  DC steeper slope of development for Bayley Mental Scale.
Lindstrom & Tannen- baum, 1970	23 DC children approximately 60 mo.  23 control (19 en- rolled in Head Start 3 wk. at time of test- ing) matched on age, race, sex, presence or absence of father, number of children in home; and parental ed- ucation and occupa- tion when possible.  17 DC and 7 control mothers worked.  All low income.	Attended Syracuse Children's Cen- ter $\bar{X}$ = 43 mo.; Range = 32-55 mo.  <u>Program:</u> Emphasized cognitive and linguistic development.	Final set of measures be- fore children left prog- ram.  Stanford-Binet; Preschool Inventory (PSI); Boehm Test of Basic Concepts; Peabody Picture Vocabulary Test (PPVT); Auditory-Vocal Auto- matic, Motor Encoding, Audi- tory-Vocal Association, and Vocal Encoding subtests of Illinois Test of Psycho- linguistic Abilities (ITPA).	1 mo. older than DC  DC higher IQ (106 to 97); total PSI and Associative Vocabulary Subtest; PPVT; Boehm Test of Basic Concepts; total for 4 sub- tests of Auditory-Vocal Associ- ation Subtest & ITPA.

Table 4  
Summary of Research Regarding Health of Infants and Toddlers in Group Day Care.

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Loda, 1972	45 DC from 29 different families.	Average = 40 hr./wk. in center.	Daily record of health status for each child.	$\bar{X}$ = 8.4 respiratory illnesses per child per year.
Loda, et al., 1972	Ages 6 wk.-5 yr. Approx. 50% Black; 50% Caucasian.	Children in mixed age groupings; 6 wk.-5 yr. Complete health care provided. 111 children admitted and not isolated. Data gathering covered 40 mo. Capacity 40 children in 2 separate units. Mixed ages 6 wk.-5 yr. Program: Children under 30 mo. separated from older children for part of day.	111 children seen by nurse epidemiologist and/or pediatrician. Children with respiratory illnesses had throat cultures for viruses, mycoplasma, group A streptococci; and nasopharyngeal swabs for bacteria or nasal washings for virus & bacteria. Cultures for all children taken on scheduled basis.	Highest rate = 9.6 children under 1 yr. Lowest rate = 6.7, 5-yr-olds. Little seasonal variation within each year. Were periods of incidence variability over the years of study (monthly range = 11-2 illnesses for 10 children). New viral respiratory agents spread rapidly & disappeared. No increase over expected for nonrespiratory infections.



Table 4

## Summary of Research Regarding Health of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Kearney, et al., 1975	24 DC 3½-13 mo. old. 28 HR matched for age, sex, ordinal position & SES. 94% stable nuclear families. Urban. Predominantly working class. All children were 1st or 2nd born; normal, full-term pregnancy, free of physical ab- normalities. 50% Chinese; 50% Cau- casian.	Enrolled at 3½ mo. of age. Minimum attendance 4 hr./da./ 5 da./wk. Capacity: 15 infants; 20 tod- dlers. Adult-Child Ratio: 1:3 infants; 1:5 toddlers. Children with minor illnesses examined and allowed to partic- ipate.	Impressions of physician. Attendance records.	Daily attendance fluctuated be- tween 85-100%. Incidence of respiratory disor- ders appeared similar to surroun- ding community.
Keister, 1970, 2, b	14 DC matched with HR for sex, race, age, education of parents, & birth order when possible. Most middle class.	6-9 hr./da. in center. Length of attendance not re- ported for total sample. (Can enroll) at 3 mo. Some in DC for 21 mo. Adult-Child Ratio: 1:5 under 20 mo.; 1:5 7/6 over 20-36 mo. Capacity: 31; 21 birth-36 mo. Separated into groups. Birth- 14 mo.; 15-20 mo.; 20-36 mo. Pediatric Consultant 2-4 hr./ wk. "Sick Bay" for minor ill- nesses.	Repeated measures at 3, 6, 9, 12, 18, 24, 30, 36, 42, & 48 mo. Pediatric examination. Illness reports by staff & parents during weekly tel- ephone interviews.	(Analysis only for differences between initial and final meas- ures.) DC more illnesses, primarily diaper rash, colic and runny noses. No differences in height and weight.

Table 4

## Summary of Research Regarding Health of Infants and Toddlers in Group Day Care (Continued)

Author/ Date	Children	Day Care Experience	Measures of Major Dependent Variables	Summary of Major Results
Doyle 1975	12 Canadian DC matched with HR in age, sex, parental education, occupa- tion & age, sib- lings.  Age X = 18.5 mo.; Range = 5-30 mo. 10 male; 14 female.  Most middle class.	$\bar{X}$ = 7 mo. attendance.  <u>Adult-Child Ratio: 1:4; 1</u> staff member was R.N. No in- formation re: health policies.  <u>Capacity: 45 total; 20 under</u> 2 1/2 yr.	Frequency of: infectious diseases rash fever constipation flu colds ear infections  Assessed in 4 semi-monthly telephone calls to home.	DC greater incidence of flu.