The influence of quality day care on early academic achievement

Leisa Gaye Standish

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THE INFLUENCE OF QUALITY DAY CARE ON EARLY ACADEMIC ACHIEVEMENT

A Project Presented to the Faculty of California State University, San Bernardino

In Partial Fulfillment of the Requirements for the Degree Master of Arts in Education: Elementary

by Leisa Gaye Standish

March 1994
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Approved by:

Ruth Sandlin PhD, First Reader
3/9/94

Todd Jennings PhD, Second Reader
3-15-94
ABSTRACT

The purpose of this project was to examine the effect of quality day care experience on early elementary school achievement to ascertain the impact of the societal trend toward extended periods of day care for an increasing majority of children under five.

Grade two pupils from five Catholic elementary schools completed surveys indicating the students pre school experience and income bracket. The day care facilities were then contacted for observation and interviews to assess measures of quality care.

The data gathered from the two initial procedures were then entered into a t-test to assess for statistical significance between the academic achievement of children with quality day care experience and those without. The t-test was used again in two further tests to assess the socio economic status variable.

The results of the three t-tests indicate that there is no statistically significant difference found between children with quality day care experience and those reared in the home. These results are encouraging for educators in the early elementary grades as they indicate that children attending quality day care and their home reared peers will not be disadvantaged by societal trends toward increasing attendance in pre school programs.
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CHAPTER ONE

INTRODUCTION

The ideal family unit traditionally consisting of grandparents, father, mother and offspring is rapidly shrinking in the progressive society of the nineties. This ideal unit of yesteryear enabled the physical, cognitive and psychosocial development of the child to occur in the stability and safety of the family domain. Early education consisted of an interaction between the child, home and community; all the necessary components for optimum development of the pre-school child.

There has been much consideration of the benefits of home care as opposed to community care. Researchers (Belsky, 1984, 1986; Clark-Stewart and Fein, 1983; and Rutler, 1981) have found few differences between children growing up in their homes, in day care homes and in day care centers (Andersson, 1989). Due to societal and economic changes during the last thirty years, there has been an unprecedented growth in professional day care facilities. In 1987, 46 percent of pre-school children were placed in a day care home or center (US Bureau of the Census 1987b, Table 3). By 1995, fully two-thirds of all pre-school children will have mothers working in the community (Hofferth and Phillips, 1987).

The shrinking traditional family necessitates a dramatic change in raising young children. Economic trends have increased the likelihood that families will require two incomes to maintain the family in comfort. In 1988, the median income for families with children was $30,721, less than 7 percent higher than the 1979 level after adjusting for inflation (Bureau of
the Census, 1988c). However, between 1970 and 1988 the proportion of working mothers rose from 30 to 56 percent indicating that dual income families are working only to maintain the income earned in the past by a single income (Bureau of Labor Statistics, 1988). In 1986, Bluestone and Harrison found that one-third of new full-time jobs created since 1978 have paid an annual wage below the poverty line for a family of four. Well paying jobs in industry are declining and non-professional jobs in the service sector pay lower wages than in the industrial sector (Lubbeck, 1989).

The number of female headed households is increasing. In the 1950's and 60's the divorce rate showed fewer than ten divorces per 1000 marriages, in 1991 statistics show a dramatic increase of twenty-one divorces per 1000 marriages. The out of wedlock birthrate rose from 5 percent in 1960 to 27 percent in 1990. The majority of children in households dependent on women as the sole earner are living in poverty due to wage disparity, inadequate or non-existent child support and insufficient welfare payments (Lubeck, 1989).

The current social climate of dual income families, solo parenting, working mothers and developmental deprivation amongst the disadvantaged is indicative of the need for quality developmental day care facilities. Research and experience shows that day care must show evidence of high standards of quality performance by competent child development professionals who establish an environment that supports active learning and facilitates all developmental domains to achieve optimum results. As a
result the debate between quality and affordability has arisen. There is a valid concern regarding the conflict between quality and affordability. Due to low entry barriers into the field, a large labor pool is created, and compensation is low. The average wage for a full time day care teacher is as low as approximately $6.00 per hour with minimum or no benefits. A day care teacher may have as little as twelve units at community college and a director a minimum of two years experience and a two-year certificate (Riverside Community College, 1993). Consequently the beginning years of a child’s life are often entrusted to the undereducated, understaffed and underpaid.

Quality day care centers must fit the developmental needs of both the age group and the individual child (Karweit, 1988). To ensure quality programs for young children, there should be developmentally appropriate activities as well as small class size, low staff to child ratios, trained personnel with ongoing professional development and parental support are essential (Day and Thomas, 1988).

Longitudinal studies (Andersson, 1989 and Peterson and Peterson, 1986) have shown that quality day care rivals quality home care in preparation for the skills needed for school (Andersson, 1989). Studies on children from disadvantaged homes involved in developmental pre-school programs, when compared to the control group, not only show lower retention rates but also lower numbers classified as mentally retarded and fewer placements in special education. Long term studies also indicate that those involved in pre-school programs are less likely to drop out of high
school, receive welfare or fall pregnant in their teens. These and other
significant results show the short and long term advantages of quality care
(Peterson and Peterson, 1986).

This inquiry will use material from journal articles, research and
other literature to design a research study to examine the effect of
developmental day care instruction on school age children and the
influences and variables that affect the outcomes. The research design will
develop and address the following hypothesis: There will be no statistically
significant difference, at the 0.05 alpha level, in Grade 1 student’s
performance between students who attended quality day care centers and
those who did not attend quality day care centers.
LITERATURE REVIEW

There is an increasing body of evidence that indicates that child care is a significant force in society today and statistics and trends indicate that child care enrollment will continue to rise (Karweit, 1988; Lubeck, 1989; Ruopp et al., 1979). The marked social change that impinges on the lives of families and children have sparked a wave of psychological and academic research. This review will explore initial research in child care which assessed intellectual and social development of children as well as variation in child care quality and children's development. This review will then examine literature defining what constitutes quality care and how quality child care influences and affects school achievement.

Initial Research on Child Care

The first studies conducted on child care facilities concentrated on the effects of center care on children's intellectual and social development compared to home-reared children. Findings on measures of intellectual development indicate that socioeconomic status is an important factor in evaluating research among children in child care (Belsky and Steinberg, 1978).

Pierson and associates (1984) conducted (the Brookline Early Education Project in Massachusetts) a study which found that the school problems of middle class children are lessened somewhat by experience in good early childhood programs. These findings are consistent with Anderson (1989), who studied the effects of public day care over a seven
year period. Anderson concluded that children with early day care experiences were generally rated more favorably by their teacher on school performance and social and personal development and performed better on aptitude tests than children with late entrance or home care. There was a tendency for center care to predict a more favorable outcome on children’s cognitive and socio-emotional development than other care.

Rubenstein and colleagues (1981) engaged in a two-year follow-up of infants in community-based day care and found that the day care children scored significantly higher than their home-reared counterparts on two measures of language development, the Peabody Picture Vocabulary Test and the Mean Utterance Length (MLU).

Belsky and Steinberg (1978), however, conclude that middle class child care and home-reared children do not differ on levels of intellectual development. Overall, studies of more economically advantaged children in community-based day care find either similar or greater levels of cognitive development to their home reared peers.

Bryant and Ramey (1987) (cited in Guralnick and Bennett, 1987) examined studies of early intervention programs for children from disadvantaged families. They considered the role of the child’s age at entry, duration and intensity of the intervention program, the nature of educational activities and whether the child or the parent were the primary targets of the intervention. They conclude that program effectiveness was most closely linked with the child’s extent of contact with the program and the most improvement occurs in intellectual development when children
Lee et al. (1990) investigated the effects of Head Start by conducting a longitudinal follow-up comparison of disadvantaged children attending head start, a community preschool and children with no preschool experience. They found that children who attended head start maintained educationally substantive gains in general cognitive ability, especially when compared to children without preschool experience. Their findings also suggest that the effects were found for preschool programs rather than head start per se. The cognitive effects were found to diminish over time but were not reversed, the author’s indicate that it may reflect differences in the quality of subsequent schooling or home environment.

Studies on early intervention programs for disadvantaged children consistently show gains on measures of intellectual development are temporary but can be sustained when intervention is continued into the elementary school years. Horacek and colleagues (1987) found that children who participated in a preschool program and a school age support program performed better in school than the group that had only preschool intervention.

Longitudinal evaluations of early intervention programs also show persistent advantages for disadvantaged children. Darlington and associates (1980) studied a group of 10-17 year olds who attended early intervention programs finding that these children were less likely to repeat a grade in school and less likely to be referred for special education than those who had not participated. Similarly, the Perry Preschool Project conducted by
Schweinhart and colleagues (1984) found that at age 19 the children who participated in head start programs had a higher graduation rate, scored better on functional competence tests and spent fewer years in special education.

The cognitive development of children from families of all socioeconomic levels appears to consistently indicate that child care attendance does not have any negative implications but rather in many cases shows significant gains in intellectual achievement of those children participating in center programs. The social development of children in child care is a further concern for child care researchers. The results suggest that child care children relate more to peers and less to adults than home-reared children (Belsky and Steinberg, 1978).

Clarke-Stewart and Fein (1983) (cited in Mussen 1983) conclude that in observational studies children with experience in early childhood programs appear to be more popular and form relationships with other children more often and in a more positive manner.

Rubenstein and associates (1981) also found that compared to home-reared children, day care children used peers in a positive manner for comfort and gratification, anxiety or distress. In contrast to findings on the positive effects of day care this study indicated that temper tantrums and non-compliance with care givers were found significantly more frequently in the day care group. The author's findings on non-compliance of day care children in their relationships with adults is consistent with other studies in this area (Belsky and Steinberg, 1978; Clark-Stewart and
However, Clark-Stewart and Fein (1983) found that in addition to differences in the nature of their relationships with adults and peers, children in child care show greater social competence. They found that children involved in day care scored higher than home-reared children on a rating of social competence which included awareness of social norms, appropriate independence, friendliness, responsiveness and social confidence. The author's hypothesize that children develop greater social competence in part from the skills developed from interaction with a range of different peers.

The first wave of research leads to the conclusion that child care participation is not harmful to children's development and, in certain respects, children benefit from experiences in child care. In the area of cognitive development child care participation can have significant benefits for middle class children. Furthermore, high-quality cognitive development programs have positive implications for short and long term intellectual development and school success among disadvantaged children. In the area of psychosocial development day care children show a shift in social orientation away from adults and toward peers that shows a pattern of richer and more complex peer interaction as well as greater overall social competence when compared to home-reared contemporaries.

The Second Wave of Research

During the initial research on child care centers, it became obvious
that child care programs and method of operations are extremely different. The second wave of research examined the implications of quality day care on children's development and what the implications of quality care are for the elementary school years. Researchers generally use three approaches to measuring quality; a summary measure based on physical aspects such as, ratios, training, organization and routine; a composite measure such as the Harms and Clifford (1980) Early Childhood Environment Rating Scale; and finally, a definition of quality in terms of children's experiences in day care.

Quality care has been found to be associated with children's cognitive as well as social development. In the National Day Care Study of center care in the United States (Ruopp et al., 1979) children's improvement in test scores on the Preschool Inventory (PSI), a school readiness test and the Peabody Picture Vocabulary Test (PPVT) were documented from fall to spring. These test scores were related to the center group size, teacher qualifications and center goals. The results showed greater gains in test results in centers that stressed cognitive development, focused on individual development and held smaller group sizes. In centers in which care givers had child related education and training children showed higher scores on the PSI test. Centers with individual interaction, more teacher management of activities and more social interaction with children evidenced greater gains on PPVT.

Burchinal and associates (1989) examined the type of day care and preschool intellectual development in disadvantaged children. The results
showed that quality day care positively effects the overall preschool cognitive development of socio-economically disadvantaged children. The children attending quality community day care centers showed greater cognitive gains than their home-reared peers on preschool measures of intellectual development.

McCartney (1984) concluded that center quality appears to have a profound effects on language development. A summary measure of quality significantly predicted children's score on several assessments of language skills, including the Preschool Language Assessment Instrument and the Adaptive Language Inventory.

The quality of care is also associated with day care children's psychosocial development. Anderson and colleagues (1981) studied the behavior of preschool children in relation to the level of involvement with center care givers. Day care children with highly involved care givers showed behavior indicative of secure attachment; more initial exploration of unfamiliar environment, more contact with the care givers and more selective orientation to the care giver rather than a stranger.

Howes and Olenick (1986) observed that children in high quality settings were more compliant and less resistant to care givers showing greater likelihood to regulate behavior than children in low quality centers. Howes (1983) supports these findings in a study on care giver behaviors. Results show that care givers with fewer children, shorter hours and less peripheral duties engaged in more facilitative social stimulation, were more responsive and less restrictive. Children in high quality child care "may
be more socially adjusted because their socialization experience and encounters with peers are mediated by competent care givers who are likely to stress problem solving techniques” (Howes, 1983).

Overall the findings for social development as for cognitive development support the prediction that quality care is related to measures of development. In order to assess quality care on longitudinal studies showing the effects of day care on elementary school performance it is necessary to be more specific in defining quality care.

Defining Quality Care

The preceding studies on the effects of quality care indicate four broad aspects that constitute quality care. These include, the physical environment of the care center, the care giver's behavior, the curriculum and the number of children.

Studies indicate that the number of toys and the amount of physical space in day care facilities is not as important as the organization of the space and the quality of the materials available. Howes (1983) found that children's performance improves in centers that are neat, safe, organized into interest areas and involved appropriate children's activities.

Sylva and associates (1980) found that children are more likely to do constructive, mentally challenging activities with building materials, to have interesting conversations when involved in dramatic play and to cooperate with peers in social games. This indicates that children do better in centers where there are varied and educational materials.
The research suggests that children are more likely to reach optimum development not only when the materials are varied and educational but also when care givers are stimulating, promote educational activities and are respectful to the children they teach (Golden et al., 1978; Howes, 1983). Researcher's have also found that positive behavior among care givers is most likely to be seen in those who have higher levels of training in child care, more experience in the program and higher levels of training in child development (Howes, 1983; Ruopp et al., 1979). Whitebrook and colleagues (1990) found that the stability of care givers is also significant. Day care centers with a low staff turnover were rated highly on overall quality.

The quality of the curriculum appears to encompass a balanced program of social and intellectual pursuits. Clark-Stewart and Fein (1983) found that it is important to have some organized and supervised activity but Sylva et al. (1980) argues that too much structure is not beneficial to children's development. Developmentalist's indicate that it is also important to give children the opportunity to explore, play and learn on their own (Berger, 1983). Schweinhart and Weikart (1986) found that a variety of curricular can promote intellectual development, but what is more important is to encourage children's self direction and independence to produce children who are more likely to be cooperative, self confident, assertive and aggressive.

The research on the number of children in day care classes suggests that children are negatively affected by large class size and low adult-child ratios when the number of children is very large (more than twenty)
or very low (less than ten) or if the children are very young (Howes, 1983; Ruopp et al., 1979; Sylva et al., 1980). Also McCartney (1984) found that when children spend more time just watching, playing, fighting and imitating other children they tend to be less competent socially and intellectually. He indicates that children need an environment where they are stimulated and have class sizes that enable teachers to provide adequate attention, dialogue and productive, meaningful activities.

High quality day care, in this review, is best defined by a well organized, stimulating physical environment, a responsive, well-trained care giver, a balanced curriculum and relatively small classes. In contrast, low quality day care is characterized by an imbalance and varying amounts of organization, stimuli, staff training, curriculum, and class sizes. When defining quality care it is also useful to briefly outline the three domains of development that reflect important areas of agreement that shed light on children's development and research in early education.

**The Domains of Children's Development**

Psychologist, Kathleen Berger (1983) outlines the three domains of development; physical, cognitive and psychosocial, for young children aged two through six. The physical development of children is rapid in the preschool years as they change in height, weight and motor skills. From age two through six children gain about four and a half pounds and add almost three inches per year (National Center for Health Statistics, 1976). Howard Meradith (1978) (cited in Berger, 1983) reviewed more than two
hundred studies of the height of preschool children in various parts of the world and found that differences in height between geographic areas is largely due to ethnic origin and nutrition, although physical and emotional health can also affect height.

Children's gross motor skills improve dramatically between the ages of two and six. Sinclair (1973) asserts that the child's body becomes slimmer and stronger enabling children to learn, practice and become proficient in many large body movements. Fine motor skills, such as holding a pencil or tying a shoelace, also improve but more gradually. Fincher (1977) and Hardyck and Petrinovich (1977) found that children of this age, especially left handed ones, find writing difficult.

The physical development of the preschool child also involves the maturation of the brain and eyes. Tanner (1978) notes that as the brain matures it becomes more specialized and that this maturation stage is probably necessary before the child can begin academic schooling, although the precise relationship between the brain, eyes and learning is not clear.

Berger notes that children develop their physical bodies and skills through sensory motor play, mastery play and rough-and-tumble play. Children use their senses of touch, taste and smell by exploring and experiencing various textures in the sandbox, bathtub or in their food. Mastery play involves learning new skills that present a challenge to conquer, climb, roll, swing or intellectual word and idea games as they get older. Jones (1967) (cited in Bruner et al. 1976) found that rough-and-tumble play is a social activity that involves wrestling or pushing and can
be distinguished from aggression by the smile and laughter of the children involved.

Berger’s second domain outlines the study of cognitive development. The cognitive domain involves understanding what goes on within the child’s mind by recording the growth of logic and language known as preoperational thought and propounded by Piaget (1976). According to Piaget, preoperational thought is centered on one feature of an experience rather than looking at the relationship among several features. A preoperational child cannot figure out logical principles of conservation, classification, chance or gradual change. Piaget believed that at each stage of development egocentrism existed in a different form. In the preoperational child egocentrism, is characterized by the belief that other people and even objects think and act the same way he or she does and this is evidenced in children’s language development.

Carey (1977) (cited in Berger, 1983) notes that language accomplishments include learning approx 10,000 words and understanding almost all basic grammatical forms between the ages of two and six. Children often misunderstand grammatical rules, metaphors and abstractions as they learn the many aspects of a language, including pronunciation. Piaget (1959), found that due to the egocentric stage of the preoperational child’s development they are as likely to talk in monologues or collective monologues as they are to engage in socialized speech. As egocentric speech occurs at roughly the same age as this stage of egocentric thinking Piaget believes that cognitive development comes first making language
development possible. Most developmentalists agree with Piaget that young children form concepts first and then find the words to express them. However, others agree with Bruner (1964) and Vygotsky (1962)(cited in Bruner, 1983) believing that at some point during early childhood, language helps form ideas.

The third domain described by Berger (1983) is the psychosocial domain. Psychosocial development is important to a child's development due to the introduction of ideas, such as; self-concept, social understanding and moral codes. All psychologists agree that children begin to learn sex roles and moral values during early childhood, however, there are three main schools of thought as to how this occurs. The psychoanalytic theory involves the theories of Freud and Erickson who assert that young children develop powerful fantasies that result in overwhelming guilt which produces fear of terrible punishment. Freud (1938) held that children's fantasies are primarily sexual and result in the development of the superego, while Erickson (1963), stresses the child's initiative and exuberance, noting that the child sometimes feels guilty when energy exceeds acceptable limits. Learning theorists (Sears et al., 1965; Mischel, 1970; Bandura, 1969)(cited in Berger, 1983) think children learn their values from the reinforcements they receive for acting appropriately and from punishment form behaving inappropriately. Role models including parents, community and television figures are all seen to be important. The psychosocial domain also involves children's greater awareness of sex roles. The response and modeling of parents and teachers depends on their
concept of appropriate masculine, feminine and androgynous behavior.

Mildred Parten (1932) found that psychosocial development involves different forms of play that aids in preparation for the demands of school and social relationships that will later develop. As they grow older, children spend more time in associative and cooperative play. Garvey (1977)(cited in Berger, 1983) studied another form of social development known as dramatic play. This is a more complex form of social play that aids in experimenting with social roles, expressing fears and fantasies and learning to cooperate.

The psychosocial domain also involves a transmission of rules and boundaries. Parents and teachers are also responsible for creating clear and consistent rules and consequences for breaking the rules. The most effective punishments being temporary removal of something the child enjoys or timeout rather than harsh punishment.

Research in the area of the domains of children's development may be summarized into categories to promote quality care in the following areas:

1. To provide varied learning experiences with a variety of things to hear, see and handle.

2. To provide a rich language experience with books, stories and conversation.

3. To provide the freedom to run, climb, jump, explore and use simple tools.

4. To provide a supportive environment in which to answer
questions, model behavior and answer teacher directed questions.

5. To provide discipline that is neither arbitrary or permissive.

6. To allow children to solve simple problems and aid in establishing problem solving patterns.

These categories provide a concise package to examine the effects of quality day care in the long term.

**Longitudinal Studies on the Effects of Quality Care**

With quality care clearly defined within the parameters of the developmental domains it is appropriate to review the longitudinal studies that have been carried out on quality day care in relation to development in the elementary school. These studies support the hypothesis that the quality of care has continuing effects.

Howes (1988) assessed children's cognitive and psychosocial development at the end of first grade in a high quality elementary school. The sample group were diverse in ethnic background, socioeconomic status and in previous day care experience. The children had attended eighty-one different center care facilities and their development was assessed by teacher ratings of academic progress and school skills as well as parent ratings of behavior. The results showed that high quality earlier child care was predictive of better academic progress, school skills and behavior in boys and better school skills and behavior in girls.

Vandell and associates (1988) found that the quality of child care affected four year olds social behavior and peer interaction over a period
of four years. The sample group consisted of white middle-class children tested at eight years of age for the effects of day care on their psychosocial development. The results indicated that high quality day care at age four significantly predicted friendlier peer interactions, more positive natures, greater social competence and better conflict resolution.

Field (1991) related attendance in stable day care and grade school behavior and performance using two studies, one with children from stable full-time quality day care and the other from unstable, low quality in day care. The children from the group who experienced a stable full-time quality day care program were found to be positively related to the number of friends and extracurricular activities of the children. Also parents ratings showed positive relation to children’s emotional well being, leadership, popularity, attractiveness and assertiveness, while negatively relating to aggression. In addition, children with more time in day care showed more physical affection in peer interactions, were more often assigned to the gifted program and received higher math grades.

Howes (1990) examined the age of child care entry, quality of care and family characteristics on the social and cognitive development of toddlers, preschool and kindergarten age children. The sample consisted of eighty children from middle class backgrounds. The results showed that the quality of child care predicted later social but not cognitive outcomes. Lower quality child care predicted more child hostility and less task orientation in school age children. Children from low quality day care before age one were found to be more easily distracted and less
considerate in kindergarten.

Andersson (1989) studied one hundred and nineteen children from age one through eight. At eight years of age the children were tested with aptitude tests and rated by the teachers on school performance and social development. The author found that children entering quality day care at an early age performed significantly better on cognitive tests and received more positive ratings from teachers in school achievement and social attributes than those entering day care at later ages and those in home care. Boys in day care were found to be more willing to stick with their opinion and were more assertive than their home-reared peers and were also found to be more aggressive than girls in center care.

Studies on economically disadvantaged children have been discussed in the section involving the first wave of research, due to their significance to this section they are summarized at this point. Researcher's have found in longitudinal follow-up studies on disadvantaged children attending intervention programs that children attending these programs maintain educationally substantial gains in general cognitive ability. These gains are seen to be most significant when families receive parent training and other services concurrently with child programs. It is also agreed that these gains diminish over time but are not reversed (Bryant and Ramey, 1987; Lee et al., 1992; Darlington et al., 1980; Schweinhart et al., 1984). However, these intellectual gains were found to be sustained when intervention is continued into the elementary school years (Horack et al., 1987).
Conclusion

The research strongly supports the idea that child care quality is important to children's development. Additional studies indicate that quality child care continues to affect children's development in the early school years regardless of children's economic background, although longer lasting and more significant gains are found in children from disadvantaged homes. Due to societal trends in day care, and the importance of education in today's competitive job market, these findings are significant to parents and educators in giving children the best start possible as the children that will become our nation's future emerge.
CHAPTER TWO
DESIGN AND PROCEDURES

A. Goals of the Project
This study was designed to assess the influence of quality day care experience on school age children. The aim of the project was to explore any differences in academic achievement between middle/upper income children with day care experience and those with no day care experience. Of particular interest was the interaction between day care experiences and academic achievement among different income level students.

B. Hypothesis
1. Academic Achievement Hypothesis
The hypothesis states that there will be no statistically significant difference, at the 0.05 alpha level, in grade two students academic performance, as measured by teacher ratings compiled from class scores and their letter grade from grade one, between students who attended quality day care centers and those who did not attend quality day care centers.

2. Income Level Hypothesis
The hypothesis states that there will be no statistically
significant difference at the 0.05 alpha level, in grade two students from different income levels, as measured by teacher ratings compiled from class scores and their letter grade from grade one, between students who attend quality day care centers and those who did not attend quality day care centers.

C. Procedures

1. Description of the Research Design

The completed survey (Appendix A) and student scores were compiled and the respective day care facilities were interviewed and observed to assess for quality. The student’s achievement scores were then computed through the use of a series of t-tests to determine the difference between two independent means.

The first t-test assessed the difference in academic achievement between children raised in the home and children attending full time day care prior to entering school. The second t-test examined the same hypothesis but only included data from low income earners. The third t-test examined the hypothesis including data from the middle/high income earners.

2. Controls for Quality

To control for quality day care experience the only surveys used in the experimental design were those from day
care facilities that satisfactorily met the quality day care measures. The level of quality day care experience was established with an evaluation of the four measures of quality established from the literature review (Appendix B). The facilities were contacted and interviews were conducted with the director or senior staff and followed up with an observational visit. The observational visit to the facilities included a personal interview with the director of the center, interviews with selected children at play, observation of group and individual activities and the facility equipment and layout. To ensure reliability the two survey's administered were consistent in each school and day care facility, it was administered within the same time frame at each facility and was used to retest each facility in the observational visit (Thorndike et al., 1991).

The hypothesis stated that there would be no significant difference between the children who attended a quality day care facility and children raised in the home. This hypothesis was tested through the use of a t-test for the difference between two independent means. The data collected was divided into three statistical tests. The first t-test (table 1) included the academic scores for students with no day care experience (group 1) and the scores of students with quality day care experience (group 2).
The second t-test (table 1) included the academic scores for lower socio economic students with no day care experience (group 3) and the academic scores for lower socio economic students with quality day care experience (group 4).

The third t-test (table 1) included the academic scores for middle/high socio economic students with no day care experience (group 5) and the academic scores for middle/high socio economic students with quality day care experience (group 6).

3. Sample Selection Procedure and Description

Four schools in the San Bernardino area were contacted and surveys (Appendix A) were distributed to the Grade 2 teachers. The students chosen to participate in the study had either attended day care facilities in the San Bernardino county or had been home reared. A range of race and socio economic level was accepted to enable income to be a variable and the sample to be a reflection of the general population of Southern California.

This study involved Grade 2 pupils from five Catholic Schools in the city of San Bernardino, a large metropolitan area in Southern California with a population of 164,164. The mean household income level is $31,799. The city's ethnicity includes 59% Caucasian, 11% African American, 28% Latino, 3%
Asian and 1% other (San Bernardino County Economic and Community Development, 1990). The student's socio economic levels ranged from low to high with a predominance of middle class children. The ethnic groups represented in the study varied from: % Caucasian, % African American, % Latino, % Asian and % other.

Seventy-three students participated in the study. Of these fifty-one attended quality day care and twenty-two were reared in the home. Quality day care was assessed and controlled the use of a survey compiled from research completed in the literature review (Appendix B). The measures for quality day care consist of: an organized physical environment, varied educational materials, competent, trained staff, a balanced program of social and intellectual pursuits and low adult to child ratios. The children participating in the study attended quality day care for an average of three years.

Grade 2 pupils were chosen to participate in this study as they have attended school for a sufficient length of time to have lost the initial benefits of a day care program and to enable to study to indicate the longer term effects of day care. As the study was completed in the first weeks of the 1993/1994 school year, their two year school experience was short enough to evidence the lasting effects of day care.
4. Details of Variables and Measures

The survey (Appendix A) used to establish pre school experience involved a parental checklist to establish the day care facility attended, the number of years experience and family socio economic level. The teachers then provided an academic achievement rating from 1 to 5, with 1 being the lowest and 5 the highest. This rating was based on the children's letter grade from their first grade report and on their class work and test scores completed thus far in the 1993/1994 school year. This was a subjective analysis on the teacher's interpretation of the student's academic achievement.

Reliability

To ensure reliability in reporting on the initial parental surveys the questions were posed in a manner that required factual answers. Parents were required to supply basic information that could not be misinterpreted (Appendix A).

The reliability of the teacher ratings was a more subjective measure and should have been supplemented with a criterion list from the researcher. However, teachers were asked to base their rating on each child's performance in measurable tests and their past years grade reports and
portfolios.

The day care evaluation was designed to produce a consistent result as facilities were contacted and interviews were conducted by phone with senior staff or the director. These interviews were then supplemented by a further observational visit and a second informal interview with the director and children in the center. To further ensure the reliability of this measure the surveys administered were consistent in each facility and occurred within a one month period (Appendix B).

Validity

To assure validity, the surveys were identical at each school and were distributed and collected within the same one month time period. The student's academic achievement ensured reliability as the teacher's rating was supplemented with a second equivalent form of the student's score from the child's last grade report found in each child's portfolio which was made available to the researcher (Thorndike et al., 1991).

The student surveys were designed to measure day care experience and income level in grade two pupils. The surveys completed by the day care facilities measured the level of quality in organization, staffing, materials and curriculum. The objectives for this survey were researched and detailed in
the literature review to ensure validity. The survey was also valid in that each day care facility had an equal opportunity to score well on the survey due to the identical interviews and observational visits (Thorndike et al., 1991).

D. Results

The first t-test for the difference in academic achievement between children who attended quality day care (group 1 mean=2.91, N=64) and children who were reared in the home (group 2 mean=3.25, N=166) showed no statistical significance. The mean scores show that children attending day care scored a little higher on average but not high enough to warrant statistical significance (Table 1).

The second t-test for the difference in academic achievement between children attending quality day care (group 3 mean=3, N=15) and their home reared counterparts (group 4 mean=2.2, N=11) from the lower socio economic sector also showed no statistical significance but the sample was too small to be considered a valid measure (Table 1).

The third t-test measuring the difference in academic achievement between children who attended quality day care (group 5 mean=3.12, N=49) and those who were reared in the home (group 6 mean=3.4, N=155) from the middle to high socio
economic sector also showed no statistical significance. However, again the mean score for children who attended day care was slightly higher than the children who were reared in the home.

In conclusion, the results from each of the three t-tests indicate that there is no statistically significant difference at the 0.05 alpha level. In each of the three tests the t score was less than the degrees of freedom. The mean scores representing academic achievement showed a similar level of school success for children from both groups with a slightly higher mean score for children who attended quality day care.

E. Discussion of the Findings

The results of this study are consistent with the findings of Belsky and Steinberg (1978) who found that middle class children attending day care and their home reared counterparts did not differ on levels of intellectual development. However, due to the nature of the small sampling of those children in the low socio economic bracket this study cannot provide support for Pierson and associates (1984) and Anderson (1989) who found that there was a tendency for center care to predict a more favorable academic outcome for school age children in the lower socio economic sector.

Research from the literature review indicates that
quality day care settings have a positive effect on overall cognitive development and profound effects on language development (Burchinal and associates, 1989 and McCartney, 1984). This was not evident in this study as only marginal intellectual gains were shown in the mean scores. A further measure that could have been implemented to show evidence of this fact could have involved data from low quality day care as a comparative measure such as research conducted in this area by Field (1991).

The results of studies by Anderson (1989), Howes (1988) and Field (1991) indicating that quality day care experience results in higher levels of academic achievement were not evidenced in this study. This fact could be related to the nature of the small sample collected or the quality of home care provided by parents who are concerned enough about their child's education to send them to private school.

F. Limitations

The principal limiting factor of this study was the small number of surveys returned. A total of two hundred surveys were distributed among the five schools in the sample. Only seventy-three surveys were valid for use in this study. This factor resulted in a small and uneven sampling which was not ideal.
Due to the small number of usable surveys from those in the lower socio economic sector the second t-test was rendered invalid as an indicator of the socio economic variable.

The researcher's failure to provide a criterion list to the classroom teachers for the students academic ratings, also weakens the reliability of this measure and acts as a limiting factor.

The limitations of the study include the narrow region in which the study was conducted. By limiting the study to the San Bernardino area the results indicate valid findings as a representative for the Southern California region but a wider representative sample group would be needed to incorporate nation wide significance.

A further limitation of the study included the nature of the sample. The families surveyed were all from the private school sector and many may assert that the study is limited to a fairly privileged group not representative of the region. This limitation is lessened somewhat due to the subsidized nature of the parochial school system as well as the fact that many in the lower socio economic sector sacrifice to send their children to a school representative of their religious affiliation.

The lack of data from children with no day care experience lessens the reliability of the statistical data.
yet reflects the percentage of children reared in the home.

G. Implications for Education

The results of this study are encouraging for educators. The fact that no statistically significant difference was shown between children attending quality day care and those reared in the home indicates that these two groups of children are not disadvantaged by societal trends which indicate that increasing numbers of students will be attending day care facilities in the future.

The implications of this study indicate that as educators we must support and encourage parents to use established indicators of quality day care when choosing a pre school experience for their children as if children are unable to be reared in the home they will not be disadvantaged academically if they attend a quality day care facility.

The results of this study also indicate the importance of quality experiences for those children unable to be reared in the home prior to school entry to ensure early academic success. Due to the increasing number of parents sending children to day care facilities, as highlighted in this study, the importance of quality day care for early academic success is vital. For this reason consideration should be given, in educational circles, to the budgetary constraints inhibiting
a greater choice of quality day care. Educational support should extend beyond the present school system to include programs for advantaged children as well as disadvantaged at the pre school level. This support should include government funding, employer assistance, corporate funding and grants to develop and improve the training of quality child care staff.

To ensure success in an increasingly competitive world market, as educators, we must strive to provide quality education for our nations children at all ages including those at the pre school level.
Appendix A

DAY CARE SURVEY

Please complete the following survey and return it to your child's class teacher. No names will be used with this information, it is purely for statistical purposes. Thank you.

Did your child attend a day care/pre school center prior to age 5?

_____ yes

_____ no

If yes. For how many years? ________________ year(s)
For how many hours per day? ________ hour(s)
Name of day care/pre school center ________________

What is your approximate family income?

_____________________________________________ 0 - $20,000

_____________________________________________ $21,000 - $50,000

_____________________________________________ greater than $50,000
Appendix B
DAY CARE QUALITY SURVEY

1. Is the physical environment organized into neat, safe interest areas?

2. Are there varied and educational materials available?

3. What are the levels of staff training?

4. Is there a balanced program of social and intellectual pursuits where children can explore, play and learn on their own?

5. What are the minimum and maximum adult/child ratios?
T-TEST 1
GROUP 1
QUALITY DAY CARE
TOTAL 64
MEAN 2.91
t = 0.21
df = 71(1.671)

T-TEST 2
GROUP 3
LOW SES
QUALITY DAY CARE
TOTAL 15
MEAN 3
t = 1.08
df = 8(1.86)

T-TEST 3
GROUP 5
MID-HIGH SES
QUALITY DAY CARE
TOTAL 49
MEAN 3.12
t = 0.164
df = 61(1.671)

TABLE 1

GROUP 2
HOME CARE
TOTAL 166
MEAN 3.25

GROUP 4
LOW SES
HOME CARE
TOTAL 11
MEAN 2.2

GROUP 6
MID-HIGH SES
HOME CARE
TOTAL 155
MEAN 3.40
BIBLIOGRAPHY


