



National Library  
of Canada

Bibliothèque nationale  
du Canada

Canadian Theses Service

Service des thèses canadiennes

Ottawa, Canada  
K1A 0N4

## NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

## AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

The Relationship of Home Background and  
Day Care Quality to Children's Language Performance

Evelyn Schliecker

A Thesis  
in  
The Department  
of  
Psychology

Presented in Partial Fulfillment of the Requirements  
for the Degree of Master of Arts at  
Concordia University  
Montréal, Québec, Canada

July 1988

© Evelyn Schliecker



National Library  
of Canada

Bibliothèque nationale  
du Canada

Canadian Theses Service    Service des thèses canadiennes

Ottawa, Canada  
K1A 0N4

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN    0-315-49067-5

Canada

## ABSTRACT

### The Relationship of Home Background and Day Care Quality to Children's Language Performance

Evelyn Schliecker

This investigation was designed to examine the multivariate relationship between home environment, day care quality and a standardized measure of children's verbal ability.

One-hundred 4 year old English speaking subjects, who were enrolled full-time in one of 10 Montreal area day care centres, were selected for testing. Each subject's receptive verbal ability was assessed by the Peabody Picture Vocabulary Test-Revised. The socioeconomic status of each subject's family was assessed using a comprehensive formula that is sensitive to differences in family structure. In addition, the particular demographic characteristics of each subject's family were considered. Finally, each day care centre was categorized as high or low quality as assessed by a comprehensive environmental rating scale.

Day care quality was found to be an important positive predictor of children's language performance in combination with socioeconomic status. It was also shown that families who use day care services comprise two distinct subsets of the population as a function of marital status. Day care quality

appears to be related to language performance in different ways depending on family structure. Further, quality of day care seems to be a particularly important factor in the verbal ability of children from one-parent families.

These results suggest that enrollment in day care does not impair verbal ability acquired in the home. Furthermore it seems that high quality day care may help to ameliorate some of the language deficit seen in children from one-parent families.

### Acknowledgements

I would like to thank my advisor, Dr. Donna White, for her unfailing guidance and encouragement during the course of this work. To my committee members, Dr. Lisa Serbin, Dr. David Andres and Professor Ellen Jacobs, I extend my thanks for their helpful comments on early drafts of this thesis.

Thanks are also due to Mrs. Joan Spindler for her tireless work on the coordination of the project.

Finally, to Laura and Bruce, I extend my thanks and appreciation for their continued love and support during some trying times.

## Table of Contents

	Page
Abstract .....	iii
Acknowledgments .....	v
List of Tables .....	viii
List of Appendices .....	x
Overview .....	1
Background .....	3
Social Class Differences and Compensatory Education Interventions .....	5
Family influences on the development of language. ....	5
Socioeconomic differences in language and teaching strategies. ....	6
Compensatory preschool education programs .....	8
Day Care Research .....	11
The first stage: general effects of day care .....	11
Day care effects on emotional development ....	11
Day care effects on social development .....	12
Cognitive, intellectual and language development .....	12
Limitations to the general effects approach to day care research .....	14
The second stage: the discrete dimension approach to day care quality .....	16
The third stage: the combined effects of day care quality and family background .....	19
The experience-based approach .....	20
The overall ratings approach .....	23

Statement of the Problem .....	28
Method .....	32
Measures .....	32
Day care environment .....	32
Verbal ability .....	35
Socioeconomic status .....	36
Centres .....	37
Subjects .....	40
Procedure .....	41
ECERS ratings .....	41
PPVT-R administration .....	42
SES information .....	43
Results .....	44
Discussion .....	71
References .....	84
Appendix A .....	91
Appendix B .....	106
Appendix C .....	108
Appendix D .....	112
Appendix E .....	117
Appendix F .....	119
Appendix G .....	122



## List of Tables

	Page
Table 1. ECERS Ratings for High, Medium and Low Quality Centres .....	39
Table 2. Ranges, Means and Standard Deviations for PPVT-R, SES and SES Components - Total Sample .....	46
Table 3. Means and Standard Deviations of SES Components in High and Low Quality Centres ....	47
Table 4. Ranges, Means and Standard Deviations for SES and PPVT-R in High and Low Quality Centres .....	51
Table 5. Bivariate Correlations Between SES, PPVT-R and Day Care Quality .....	52
Table 6. Staged-hierarchical Regression Predicting PPVT-R Scores from SES Alone and in Combination with Day Care Quality .....	54
Table 7. Means and Standard Deviations of Family Background Variables in One-parent and Two-parent Families .....	55
Table 8. Manova Summary Table for Mother's Age, Education, Occupation Prestige and Number of Minors in the Family by Marital Status .....	57
Table 9. Bivariate Correlations Between PPVT-R, Centre Quality and Home Background Variables; Two-parent Families .....	59
Table 10. Staged-hierarchical Regression Predicting PPVT-R from SES Components Alone and in Combination with Day Care Quality; Two-parent Families, Mother Variables .....	61
Table 11. Staged-hierarchical Regression Predicting PPVT-R from SES Components Alone and in Combination with Day Care Quality; Two-parent Families, Mother and Father Variables .....	63
Table 12. Bivariate Correlations Between PPVT-R, Centre Quality and Home Background Variables; One-parent Families .....	65

Table 13.	Staged-hierarchical Regression Predicting PPVT-R from SES Components Alone and in Combination with Day Care Quality; One-parent Families .....	67
Table 14.	Summary of Staged-hierarchical Regression Analyses Predicting PPVT-R Scores in the Whole Sample; Two-parent and One-parent Families .....	69

## List of Appendices

	Page
Appendix A. Harms & Clifford's (1980) Early Childhood Environment Rating Scale .....	91
Appendix B. Nock's and Rossi's (1980) Home Prestige Formula .....	106
Appendix C. Research Description - Day Care Directors .....	108
Appendix D. Research Description and Consent Forms for Parents .....	112
Appendix E. SES Interview Questionnaire .....	117
Appendix F. Two-step Staged Hierarchical Regression Analyses Including Sex of Child as a Predictor of PPVT-R Scores .....	119
Appendix G. Discussion Regarding Interaction Terms in Multiple Regression Analyses .....	122

The purpose of the present investigation is to examine the influence of several variables reflecting differences in day care and family environments on the language competence of preschool children. It is well known that variables related to home or family environments, such as socioeconomic status, can be used to predict children's language development (Bee, VanEgeren, Streissguth, Nyman, & Leckie, 1969; Hess & Shipman, 1965, 1967, 1968). However, as children spend increasing amounts of time in day care centres, it seems important to study the effects of environmental differences in day care, as well as home environments, on their language skills. Of particular interest in this study is the question of whether knowledge of the "quality" of day care, as measured by a global rating of day care environments, improves the predictability of language development from that of family variables.

Supplemental child care in group settings is becoming an increasingly important issue for parents as well as in the development of social policy. Despite 20 years of day care related research, methodological and statistical limitations have precluded definitive, generalizable statements regarding the effects of group day care. The majority of early investigations were focused on university based centres, predominantly serving children from professional families. In one of the earliest reviews of the day care literature, Belsky and Steinberg (1978) concluded that good quality day care need

not be deleterious to child emotional, social and intellectual development

It is now understood that university based centres are not representative of the more widely available community based centres serving a heterogeneous population. As the concept of environmental differences, or quality, of day care became the focus of research, the first approach taken was to measure discrete dimensions of day care, usually regulatable characteristics. Although teacher training, staff:child ratio, group size, density and availability of resources have been shown to relate to differences in outcome measures, little is known about the interaction of these day care dimensions. One noteworthy study (Rohe & Patterson, 1974) demonstrated that different combinations of density and resource availability resulted in observably different behaviour across conditions, illustrating that day care quality may be more than the sum of its regulatable characteristics. Accordingly, one of the goals of this investigation is to measure day care quality using a multidimensional assessment technique, the Early Childhood Environment Rating Scale (ECERS, Harms & Clifford, 1980) in order to categorize centres as either high or low quality.

Recent research has demonstrated that children in day care centres come from diverse backgrounds (Goelman & Pence, 1987a, 1987b; Howes & Olenick, 1986), yet relatively little research has considered the combined effects of day care and

home environments on outcome measures. The work which has attempted to investigate the effects of both home and day care environments has not produced consistent findings. In particular, these studies have often used day care samples in which the range of quality scores was restricted. Furthermore, although a large proportion of children in day care centres come from single parent families, nothing is known about possible differential effects of day care quality on children from different family constellations. The present study therefore investigates the combined effects of home and day care environments, ensuring that a wide range of day care quality is sampled. As well, the differential effects of day care quality in combination with family background were investigated in one-parent and two-parent families separately.

#### Background

The purpose of this investigation is to examine the influence of both home and day care environments on the language comprehension of preschool aged children. The review of the literature on day care is reported in two main sections. In the first section, research concerning home influences on language development and a brief review of compensatory education (CE) programs is presented. It is generally accepted that language development is related to socioeconomic status, and that differences exist in the home environments of low and high socioeconomic level children which seem to account for differential language skills (Bee,

VanEgeren, Streissguth, Nyman, & Leckie, 1969; Hess & Shipman, 1965, 1967, 1968 ). These findings as well as the work of Hunt (1961, 1964) and others, were influential in attempts to ameliorate environmental disadvantages. During the 1960's preschool compensatory education programs were established on the premise that an enriched environment may be beneficial to children from economically disadvantaged families.

Compensatory education was generally shown to provide some long-term gain for these children. However, the compensatory education programs can not be equated with the day care currently offered to children. Compensatory programs, though they represent a variety of educational doctrines, have been expressly designed to provide an enriched environment. Thus, the compensatory outcome studies provide evidence for the influence of extrafamilial environments on intellectual development. However, it has yet to be determined that day care provides a form of compensatory education to low SES children.

Day care research has followed a somewhat different path. In the second section of the review, several stages of day care research are discussed. In the first stage of the research, investigators were concerned with the general effects of day care on development. Such studies generally compared children placed in day care centres to home reared children. According to these early investigations, no deleterious effects on child development were found as a

consequence of placement in "high quality" day care. This conclusion marked the beginning of a second stage of research examining differences in day care environments and attempts to define day care quality. These studies generally investigated regulatable characteristics of day care centres and found that such dimensions as teacher:child ratio, group size, and caregiver training could be related to outcome measures such as language development. However, investigators strongly urged that a more global measure of day care quality might better reflect environmental differences. As well, it was suggested that day care quality needed to be examined concurrently with family background. More recently, researchers have begun to investigate the combined effects of day care and home environments. Studies in which a multidimensional index of day care quality is combined with home background variables to predict outcome measures represent the third stage of day care research and are discussed in the last section of the review.

#### Social Class Differences and Compensatory Education

##### Interventions

Family influences on the development of language. In a review of the cognitive development literature, Rutter (1985) noted the marked effect of family influences on preschool children. Language is one area of development which has been shown to be mediated by environmental factors. In view of the rapidity with which the complexities of language are learned,



it is quite clear that language acquisition is more than a function of environmental influences, or learning. Theories of language may vary somewhat in orientation; however, it is generally agreed that "...languages are learned partly 'from the outside in'..." (Gleitman, 1981, p. 104). Children's language learning is facilitated by speech slightly more advanced than their own and is assisted by adult-child interaction (de Villiers & de Villiers, 1978).

Language acquisition clearly has a strong maturational basis; however, by four years of age most children have acquired a basic mastery of their language. The continuing development of language, vocabulary in particular, is reflective of the situations in which language is used (Jenkins, 1969) and comprehension seems to be connected to the type of speech encountered in daily experiences (de Villiers & de Villiers, 1978).

Socioeconomic differences in language and teaching strategies. Cross (1977) observed that the complexity of parents' speech is highly correlated with their children's level of language comprehension. Furthermore, evidence suggests that teaching strategies and speech patterns differ according to socioeconomic status (Bee et al., 1969); Hess & Shipman, 1965, 1967, 1968). In a series of reports on social class differences in maternal style, Hess and Shipman (1965, 1967, 1968) found that maternal speech and teaching strategies are two dimensions that vary widely across social class and

are closely related to children's learning. They also found a relationship between maternal linguistic input and children's level of cognitive functioning. Middle class mothers were observed to be more direct and efficient in their teaching strategies (Hess & Shipman, 1965), use longer and more complex sentences with their children, and use more discriminating words and fewer personal pronouns (Hess & Shipman, 1965, 1967, 1968). Hess (1968) has suggested that lower class children are not socialized in a way conducive to productive learning in our middle-class, verbally oriented school systems. This contention is shared by Bee et al. (1969) on the basis of their findings in a replication of the Hess and Shipman (1965, 1967, 1968) reports. In individual laboratory sessions, they observed the interactions of 114 mother-child dyads during a ten minute waiting period and during a problem solving situation (76 lower social class and 38 middle class dyads). Their findings, consistent with earlier studies, indicated that the middle class mothers gave more attention to their children, were less controlling and disapproving and provided more information to their children when compared to lower class mothers in the waiting room situation. In the problem solving situation, there were also substantial social class differences. Middle class mothers gave fewer specific suggestions to their children and provided more suggestions in the form of questions. In addition, they tended to focus more on positive rather than negative aspects of their children's

approach to solving a problem. During an interview session, middle class mothers used longer, more complex sentences and fewer personal pronouns (Bee, et al., 1969).

The empirical findings on social class differences in speech patterns consistently indicate that lower class mothers use less complex speech, suggesting that their children may be at a disadvantage regarding linguistic performance (Hess & Shipman, 1965, 1967, 1968). The compensatory education programs placed some emphasis on language development, for several reasons. Linguistic competence is thought to be related to general intellectual development (Belsky, 1984), is a good predictor of scholastic success (Jenkins, 1969, Lazar & Darlington, 1982), and has been related to problem solving skills (Ives, 1980). In view of the importance of language in intellectual development, and the demonstrated variability on this skill between socioeconomic strata, it is not surprising that enriched language experiences were common to the various compensatory education programs. Their goal, however, was not language acquisition per se; the goal was to provide overall intellectual stimulation.

Compensatory preschool education programs. Research during the 1950's indicated that children living in impoverished environments did poorly on intellectual achievement tests and often had poor academic records (Anastasi, 1958). The publication of Hunt's (1961) influential work on the role of environmental influences on intelligence

provided, in part, the impetus to institute preschool enrichment programs designed to enhance the cognitive development of children from low income families. The compensatory education programs varied widely in theoretical orientation, curricula and the ages of target groups (infancy to 3 or 4 years). The programs did share a common goal, however, that of providing poor children with the same advantage as middle class children upon entering elementary school (Belsky, 1984; Belsky & Steinberg, 1978; Condry, 1983).

The expectation was that preschool intervention would result in long-lasting cognitive gains (Rutter, 1985). The results of early intervention programs were considered disappointing at first. Initial gains in IQ were recorded, although they tended to disappear within a few years following the program (Ramey, Dorval & Baker-Ward, 1983; Wachs & Gruen, 1982). The design of these programs, and the expectations related to them, have been widely criticized. Wachs and Gruen (1982) noted that programs were designed without a thorough understanding of the nature of early environmental influences. They also criticized the assumption that intervention would benefit all children equally, and that effects of intervention would be global and linear. In addition, it has been suggested that too much was expected of intervention programs and questions were raised regarding the reliance of IQ tests as outcome measures (Ramey, Dorval & Baker-Ward, 1983).

In answer to the doubts about the efficacy of

intervention programs, several researchers have noted that although initial gains in IQ disappeared, some long-term positive effects were seen. The Consortium for Longitudinal Studies, formed in 1975, analyzed follow-up data for 11 different early intervention programs. They reported that children from early intervention programs were less likely to require special education classes. Moreover, fewer grade failures were found in comparison to children from similar backgrounds who had not experienced early intervention (Condry, 1983). The conclusion was that "high-quality preschool education programs had positive, long-term effects on the subsequent school experiences of participating children" (Condry, 1983, p. 28).

The results of the compensatory education programs have often been cited in the "effects of day care" literature. These programs, however, were targeted for a specific population considered to be at risk for optimal development and were expressly designed to provide an enriched environment. For these reasons, they are no more likely to be representative of day care centres in general than are the university based centres of the early day care research. The compensatory education outcome studies are relevant to the day care literature, however, in that they provide evidence for the long term influence of extrafamilial environments on intellectual development.

### Day Care Research

The first stage: general effects of day care. Early day care research primarily addressed the issue of whether or not children should be in day care. Reports of developmental deficit and delay among institutionalized children (Goldfarb, 1943; Spitz, 1945; 1946a; 1945b), popularized by Benjamin Spock (1946, 1967) and Burton White (1975, 1981), along with interpretations of attachment theories, suggested that repeated separation from mother would cause lasting harm (Bowlby, 1951). This suggestion contributed to the widespread belief that placing children in day care would be detrimental to development (Clarke & Clarke, 1976; Lieberman, 1979; Peters, Neisworth & Yawkey, 1985).

The assumption common to both day care and compensatory education research is that the child's environment will have an impact on development, be it salutary or deleterious. Implicit in this assumption is that the home is but one source of environmental influence; other environments to which children are regularly exposed, such as day care, will also affect their development.

Day care effects on emotional development. Emotional development was assessed, for the most part, by various adaptations of the strange situation paradigm (Ainsworth & Wittig, 1969). The results of this first stage of day care research have generally indicated that day care does not disrupt maternal attachment in comparison to home-reared

controls (Blanchard & Main, 1979; Caldwell, Wright, Honnig & Tannenbaum, 1970; Doyle, 1975; Doyle & Somers, 1978; Kagan, Kearsely & Zelazo, 1978; Moskowitz, Schwarz & Corsini, 1977; Portnoy & Simmons, 1979; Roopnarine & Lamb, 1978). Although mode of caretaking (centre care versus home care) does not appear to be related to attachment behaviour, the results indicate an age effect; younger children display more distress at separation than do older children (eg., Doyle & Somers, 1978). Evidence of separation distress decreases with the length of time enrolled in the centre (Blanchard & Main, 1979).

Day care effects on social development. The evidence regarding the benign effect of day care on social development compared to home-reared controls is more equivocal than is the evidence for emotional development. Day care children are more likely to approach an age-mate and engage in positive interactions and cooperative play with peers (Clarke-Stewart, 1978; Kagan et al. 1978; Gunnarson, 1978; Ricciuti, 1974). On the other hand, elementary school teachers report that day care children are more physically and verbally aggressive (Schwarz, Strickland, & Krolick, 1974). It has been suggested that day care children are prone to higher levels of activity in general, which is viewed negatively by teachers, or that the increased peer interactions are bound to result in both positive and negative behaviours (Belsky, 1984).

Cognitive, intellectual and language development. Early

research comparing the cognitive, intellectual and language development of day care children with those who stay at home is limited. However, those early studies which do compare day care and non-day care children on these dimensions have indicated no deleterious or advantageous effects of day care (Belsky, 1984; Belsky & Steinberg, 1978).

Several researchers reported no difference in intelligence on the basis of standardized tests between day care children and home-reared controls (for example, Doyle, 1979; Kagan, Kearsely & Zelazo, 1978). When comparison groups consisted of home-reared, family day care, and day care centre children, no effect of care modality was found between the groups on a variety of intelligence and development scales (Cochran, 1977; Doyle & Somers, 1978). The ages of the children in these studies ranged from 3 1/2 months (Kagan et al., 1978) to 42 months (Doyle & Somers, 1978). Gunnarson (1978) followed up the Cochran (1977) sample at 5 1/2 years of age and again found no significant difference on tests of mental development.

The research briefly described thus far is generally representative of the many investigations belonging to the first stage of day care research. Methodological differences in the early studies on the effects of day care make direct comparison impossible, although results have been remarkably consistent despite the differences. In many cases, subjects were well matched on demographic variables and in one study



(Cochran, 1977) home reared controls were drawn from a day care waiting list in order to control for the possible effects of familial differences in attitudes toward day care.

Although these studies have generally led to the conclusion that day care is not harmful to child development, the results apply to a small subsample of the population utilizing group day care services. Some limitations to the research have been identified which clearly affect generalizability.

Limitations to the general effects approach to day care research. Limitations to the early day care research have been noted by many reviewers (Belsky, 1984; Belsky & Steinberg, 1978; Belsky, Steinberg & Walker, 1982; Rutter, 1981).

For the most part, early studies were limited to children from middle class families enrolled in high quality day cares with reported good staff:child ratios. The centres were also likely to have well trained staff, good physical characteristics and a plentiful supply of appropriate materials. Although these centres were referred to as high quality, day care quality had yet to be operationally defined. The centres may have met intuitive criteria for high quality; however, more research was required in order to identify the critical components of quality day care as they relate to outcome measures (Belsky, 1984; Belsky & Steinberg, 1978; Belsky, Steinberg & Walker, 1982; O'Connell, 1983; Rhodes,

1986; Rhodes & White, 1987).

Reviewers have also been critical of the comparison between children enrolled in day care and those cared for exclusively at home. Conclusions drawn from the home/day care dichotomy studies are based on the assumption that observed effects are due to similarities or variations in caregiving; however, caregiving was not directly assessed (Belsky, 1984; Belsky & Steinberg, 1978). Furthermore, implicit in the research comparing home care versus day care is the assumption that children who remain at home are cared for exclusively by the mother. Such is probably not the case given the likelihood of respite care by other family members and/or babysitters. The issue of multiple caregivers within the home has not been addressed (Rutter, 1981).

In summary, despite limitations to the research, it appears from the early studies that day care need not be deleterious to middle class children attending high quality centres. We cannot assume, however, that widely available day care is high quality care. As the concept of environmental differences in day care became the focus of research, the approach taken was to measure discrete dimensions of the centres, usually regulatable characteristics. Differences in outcome measures were then related to these discrete dimensions. The research examining differences in the characteristics of day care centres will be reviewed briefly in the next section.

The second stage: the discrete dimension approach to day care quality. Day care research moved out of the university based centres, and into community based centres in an effort to correct some of the limitations inherent in the first stage of inquiry cited above.

Caregiver:child ratio, group size, space, caregiver training, and the availability of appropriate materials have all been thought to be indicators of day care quality, and have been implicated with differences in behaviour either alone or in various combinations. Caregiver:child ratio and group size have most often been implicated with quality related differences in outcome. For example, in settings with fewer children per caregiver there was more individual caregiver-child interaction (Biemiller, Avis, & Lindsay, 1976), less management behaviour by caregivers and less child distress and apathy (Ruopp, Travers, Glantz, & Coelen, 1979). Centres with large group sizes tend to place more emphasis on rules and routine guidance, more teacher controlled activities and teacher restraint of children, fewer opportunities for child initiated play and social interaction, less stimulation by caregivers and lower interest and involvement in the activities by the children (Prescott, 1981). The National Day Care Study (NDCS, Ruopp et al. 1979) emphasized regulatable characteristics such as group size, staff:child ratio and caregiver training. Centres with small groups, good staff:child ratios and trained caregivers were associated with

more caregiver-child interaction, more positive child behaviour and higher Peabody Picture Vocabulary Test (PPVT) scores. Caregivers in these centres were "warm and stimulating" in their interactions with the children. Ruopp et al. (1979) noted, however, that staff:child ratio was not a critical variable in and of itself; however, it was an important feature in conjunction with small group size.

Other researchers used discrete dimensions to categorize centres as high, medium or low quality. Vandall and Powers (1983) added the number and availability of toys to the parameters in the NDCS and categorized centre quality on the basis of these somewhat arbitrarily defined parameters (Rhodes, 1986). They noted consistent differences in the behaviour of children in different quality centres, despite the rudimentary definition of quality (Kontos & Stevens, 1985). Rohe and Patterson (1974) designed one of the few studies to manipulate variables related to the day care setting by combining high and low density with high and low resources. They found more aggression in the high density, low resource environments. Adding more resources into the high density areas resulted in an increase in cooperative play. As Rhodes (1986) notes, the differences in behaviour resulting from the manipulation of variables highlights the necessity of considering the interaction of day care dimensions.

These studies did help define some, though not all, of

the characteristics of the day care centres which may be important to development. They did not tell us much about general day care quality, nor did they address the issue of salutary effects of day care to disadvantaged children.

The evidence for a relationship between home background factors and language performance precludes the assumption that effects of day care are independent of home influences. On the basis of the research cited above, it is clear that some differences in verbal skills are related to social class; therefore, SES classification, as well as the specific variables that define SES, should serve as marker variables reflecting differences in home environments. Furthermore, as noted earlier, regulatable characteristics may be important factors in day care quality; however, they probably do not represent a true overall quality index (eg., Kontos & Stevens, 1985; Rhodes, 1987; Rhodes & White, 1987). For this reason, it has been suggested that a more comprehensive measurement of day care quality be employed. Such a quality index would provide a marker variable for day care quality reflecting differences in day care environments.

The purpose of the present investigation is to determine if these two marker variables, SES and day care quality, combine in a meaningful way to predict performance on a measure of language ability. Until recently in day care research, socioeconomic status, or demographics, were considered to be extraneous or confounding variables to be

statistically controlled, or used as matching variables (Kontos & Fiene, 1987). Moreover, measurement of day care quality is often based on one or a few discrete dimensions, or is not a part of the investigation. Few studies, to date, have used comprehensive, global indices of day care quality in combination with home background variables. It is clear that home environments influence language, and that variability in home background has an effect on the way in which language develops. Children enrolled in day care centres come from homes with widely varying characteristics. In addition, day care centres differ on discrete dimensions which have been associated with variation in outcome measures. These centres are also likely to vary in quality when a comprehensive definition of the environment is used.

The following section will review the most recent day care literature which takes into consideration global measurement of day care quality and/or the family backgrounds of children in day care.

The third stage: the combined effects of day care quality and family background. Recently several researchers have published studies relating outcome measures to the additive effects of home environment variables and global differences in day care environments. Two distinct strategies have been used to describe and differentiate day care conditions. The first approach looked at differences in the home and day care backgrounds of children, and stressed the

differential experiences of children from different familial and extrafamilial backgrounds. The second approach consisted of overall ratings of the quality of the day care environment, combined with differences in family background.

The experience-based approach. Howes and Olenick (1986) used the discrete dimensions procedure to define day care quality (adult:child ratio, and training and continuity of caregivers). They were among the few researchers using this approach who included home background variables as predictors of outcome (toddler compliance). They found distinct differences in families using high and low quality child care. Children in low quality day care centres came from more complex and stressful family backgrounds and their parents were less involved with them at home when compared to children in high quality day care. Furthermore, caregivers in the low quality centres were less involved with the children. Howes and Olenick (1986) suggest that the experiences of children in stressful homes and low quality day care are less beneficial to social development than the children in high quality centres, experiencing more caregiver and parent involvement.

Clarke-Stewart and Gruber (1984) tried to identify the type of supplemental care conducive to optimal social and intellectual development. They identified four commonly used types of day care: in-home babysitters, day care homes, nursery schools and day care centres. By systematically observing the characteristics within each type of care, they

were able to enumerate the features of the physical environment, caretaker characteristics and social milieux common to each form of care. For example, nursery school teachers typically are younger and better educated than are at-home babysitters. Nursery schools and day care centres have more child related items in the physical environment, but lack the warmth and 'coziness' of at-home or family day care environments.

In addition to identifying the forms and features of supplemental care environments, Clarke-Stewart and Gruber (1984) rated eight social behaviours and one cognitive variable by means of observation within the home and in the laboratory for children placed in the different forms of care. No observations were conducted in the actual care environment. In order to contrast the social and cognitive competencies of children in different forms of care, a series of analyses of variance was carried out. The results, as reported, indicated that children in day nurseries are the most developmentally advanced of the four groups, while children with at-home babysitters are the least advanced. It should be noted however, that setting a more stringent significance level to correct for the number of analyses that were reported resulted in no significant contrasts.

In addition, bivariate correlations were reported, relating the observed competencies to the various features in (1) the two home based types of care and (2) the two centre



forms of care. Although a number of moderate correlations (in the  $r = .50$  range at  $p < .05$ ) were reported, a large number of correlations were considered and the possibility of spurious significance should not be overlooked. With respect to cognitive competence, the reported significant correlations were lost when SES was partialled out.

The subjects included in the study were reported to be from predominantly middle and professional class families, although the method of assessing socioeconomic status was not defined. It was acknowledged that sample selection probably resulted in better than average care arrangements, yet no attempt was made to identify quality of the environment beyond description of the features. Furthermore, by analyzing a multivariate problem with univariate statistics it is likely that significant relationships between day care features and observed competencies were missed.

Clarke-Stewart and Gruber (1984) conclude that variability in the forms and features of day care contribute to differences in childhood experiences thereby affecting social and cognitive development. Although this is an intuitively appealing conclusion, the reported research leaves us no closer to identifying the forms and features contributing to differences in competence, or in fact if significant differences do indeed exist. Their report is a valuable step toward describing variability within day care arrangements, yet methodological and statistical problems

render the results inconclusive.

The overall ratings approach. A series of reports detailing a study done among day care centres in Bermuda has been published (McCartney, 1984; McCartney, Scarr, Phillips, & Grajek, 1985; McCartney, Scarr, Phillips, Grajek & Schwarz, 1982, Phillips, McCartney, & Scarr, 1987). McCartney and her colleagues rated the quality of 10 day care centres using the Early Childhood Environment Rating Scale (ECERS, Harms & Clifford, 1980). In addition they collected information regarding family background of the participants. Because 84% of Bermudian children attend day care by 2 years of age, it was believed that day care research in Bermuda would eliminate the bias regarding the mode of supplemental child care that is seen in North American samples. Results indicate that children attending higher quality centres in Bermuda have higher scores on measures of language development (McCartney et al., 1982; McCartney, 1984), and are rated by teachers as more sociable and considerate (McCartney et al. 1982). They also found that centre quality has a consistent influence on children's social development even after accounting for variance due to family background measures (social values), child-care experience and the child's age (Phillips, McCartney, & Scarr (1987). Furthermore, day care quality accounted for consistently larger increments in explained variance than did family background variables (Phillips et al., 1987).

Other investigations report that SES, family values, and maternal education significantly predict child development on various measures while centre characteristics and quality ratings do not. Kontos and Fiene (1987), for example, reported the results of research conducted in 10 day care centres stratified to approximate the urban/rural, profit/nonprofit proportion of centres in northeast Pennsylvania. Centre quality was determined on the basis of licensing standards for the region in addition to an overall quality rating on the ECERS (Harms & Clifford, 1980). Correlations ranging from approximately  $r = .40$  to  $r = .50$  were found between regulatable characteristics and the overall ECERS rating. Kontos and Fiene (1987) suggest that licensing standards represent the 'floor' of day care quality, while the ECERS measures a 'professional' standard of quality. The moderate correlations indicate that the ECERS and the licensing regulations are in fact measuring two different constructs, which to date have been uniformly called day care quality. Recall that in the discrete dimensions approach to day care quality, centres were categorized on the basis of regulatable characteristics.

The data from this study indicated that family background variables were predictive of cognitive and language development, while regulatable centre characteristics approached significance in predicting social development. The ECERS scores were not predictive of any aspect of child

competence. Similarly, a study by Goelman and Pence (1987a, 1987b) reported that maternal education was predictive of language development while quality of day care centres, family day care homes, and unlicensed day care homes was not.

The discrepant findings of the research using global measures of day care quality and home background variables in a multivariate approach highlights the necessity for further research. The Pennsylvania (Kontos & Fiene, 1987), Bermuda (McCartney, 1984; McCartney et al., 1982, 1985; Phillips et al. 1987) and Victoria study (Goelman & Pence, 1987a, 1987b) were carried out in distinctly different cultures or geographic areas. It seems unlikely to expect cross cultural generalizability in such day care research.

A similar problem arises in Kontos and Feine's (1987) study which combines urban and rural populations. It is questionable if combining urban and rural populations increases understanding or simply confounds results related to differences in both types of day care available and parent values and expectations in different populations. At this stage of day care research, it seems more reasonable to study specific populations and to expect results to differ as a function of geographic location. Thus, it becomes important to obtain information on a variety of samples and especially in areas where day care is heavily utilized. The current study will investigate home and day care contributions in an urban Canadian sample.

There are also several important methodological differences which may partially account for the discrepant findings with respect to day care quality. Of primary importance to the present study is the range of day care quality assessed by the ECERS in the three studies. The one study which did report a robust relationship between day care quality and verbal skills also reported a wide range of day care quality (McCartney et al., 1982). The Pennsylvania study included a very narrow range of day care quality (Kontos & Fiene, 1987) and in the Victoria study the range of day care quality was not reported; however, examination of the descriptive statistics suggests a restricted quality range (Goelman & Pence, 1987a, 1987b). The current study sampled the range of day care quality available in an urban Canadian environment.

Two other methodological differences occur in the literature. First, a disparate amount of daily time spent in day care makes interpretation and comparison of the results difficult. McCartney and her colleagues included both part-time and full-time children in their analyses; Kontos and Fiene (1987) defined full time care as greater than 20 hours per week, while Goelman and Pence (1987a, 1987b) described their sample as attending day care approximately 30 hours per week. It is likely that a child attending day care from 9:00 a.m. until 1:00 p.m. five days a week will have a different day care experience from a child who spends a greater

proportion of his/her time in day care. In the current study, full-time day care is defined as attendance for at least 35 hours per week.

Finally, the three studies reviewed differed in their selection of variables representing "the home and family" environment. In the Bermuda study, home variables were represented by value beliefs about conformity and prosocial behaviour, while in Pennsylvania, the predictors were mother's education, use of a childcare subsidy and value for prosocial behaviour. In Victoria, mother's education represented the family situation. The bases for selecting these particular variables were generally not elucidated. One criterion seemed to be that variables which were themselves correlated with centre quality were chosen by investigators as a way of "controlling" for the fact that centre selection is related to family environment. The main problem with such an approach is that home background variables which are not predictive of centre quality may still have an impact on children's development. In fact, both types of variables should be included in multivariate analyses. It seems reasonable that measures related to home environment should allow as comprehensive a description of the home as possible. In the current investigation, home background is represented by simple marker variables such as parental characteristics and family structure. Although these variables may not allow us to draw conclusions about the process by which home

environments contribute to language development, they do provide a broad general description of the family environment.

In summary, the purpose of the present investigation is to extend the study of the contribution of home and day care quality to language development in children in several ways. First, the study adds data from an urban Canadian city not previously represented in the literature. Secondly, samples from a wide range of day care environments have been included. Third, the focus is on children who are in day care full-time. Finally, the variables were selected to represent home environments and day care quality in a broad, comprehensive manner.

#### Statement of the Problem

The literature reviewed identifies several issues which must be addressed in order to investigate the effects of home and day care environments on language development in children. First, an appropriate definition and measure of "quality" of day care environments must be selected. Secondly, the wide range of day care quality available to parents and children must be sampled to correct for the statistical problems with restricted range in previous studies. Finally, appropriate variables descriptive of the home environment and family structure must be identified.

With respect to the issue of quality, it is generally agreed that good quality day care need not be detrimental to the emotional, social and intellectual development of

preschool children (Belsky, 1984; Belsky & Steinberg, 1978; Belsky, Steinberg & Walker, 1982; Rutter, 1981). The caveat, good quality day care, is particularly important. It is accepted that community based day care programs vary with regard to intuitive quality criteria (Belsky, 1984; Belsky & Steinberg, 1978; Belsky, Steinberg & Walker, 1982; O'Connell, 1983; Rhodes, 1986; Rhodes & White, 1987); however, the operational definition of day care quality has varied in the literature. Some researchers cite one or more regulatable characteristics as quality indices, others refer to these characteristics without reference to quality, and still others use multidimensional overall quality scales (Phillips & Howes, 1987). The latter assessment technique, although not without criticism (Clarke-Stewart, 1978; Clarke-Stewart & Gruber, 1984; Phillips & Howes, 1987), has been suggested to represent a professional standard of day care quality, delineating environments conducive to optimal development (Kontos & Fiene, 1987; Kontos & Stevens, 1985).

Studies which measure discrete dimensions of day care centre environments have shown that differences in regulatable characteristics are related to differences in outcome measures (Prescott, 1970; Ruopp et al., 1979; Vandall & Powers, 1983). However, the interactive effect of these variables as it pertains to quality remains relatively unknown. Furthermore, it may be that important variables have yet to be defined. This investigation used the multidimensional approach to



categorize high and low quality day care centres.

Inconsistencies in the results of research to date, along with methodological differences imply that microanalysis of day care environments is premature. The use of day care quality as a marker variable for environmental differences may prove to be an effective way of looking at day care quality. The current study will sample the wide range of day care quality available to parents and children in an urban Canadian environment. It is expected that an overall index of day care quality will reliably identify qualitatively different environments.

The next issue to be addressed is that of selection of the appropriate variables descriptive of the environmental differences in homes. The literature suggests that family background characteristics vary widely across day care centres (Goelman & Pence, 1987a, 1987b; Howes & Olenick, 1986; Kontos & Fiene, 1987) and that the use of language varies across socioeconomic strata (Bee et al., 1969; Hess & Shipman, 1965; 1967; 1968). Thus, it seems worthwhile to examine variables that are related to socioeconomic status. There are several ways to approach the selection of such variables. The first is to use socioeconomic status itself as a marker variable indicative of family environment. This method was used in the current study. A number of measures of SES exist that are used interchangeably in the literature. The particular measure of socioeconomic status used here (Nock & Rossi, 1979)

was selected because it takes into account several aspects of family structure including marital status and number of children as well as describing both maternal and paternal characteristics when possible. Since this study uses a comprehensive measure of SES based on family structure and a wide range of day care quality was sampled, it is expected that day care quality will be an important predictor of language comprehension scores in combination with SES in the overall sample.

The second approach to describing home environments is to use specific maternal and paternal characteristics, such as age, educational level, and occupation rather than using an integrative SES formula. This approach is also used in the current study. However, given that many families who use day care are single parents, usually mother only families, it seems important to question whether one- and two-parent families should be examined separately when investigating home and day care influences on language development. Demographic variables associated with the sample used in this investigation were examined to determine if there are two distinct subsets of families within the sample.

Provided that the demographic analysis confirms that single mothers are a disadvantaged population with lower educational levels and poorer jobs, it is predicted that day care quality will have a greater impact on the language performance of children in one-parent than two-parent families.

## Method

### Measures

Day Care Environment. Environmental differences in each of eleven Montreal area day care centers were assessed by the Early Childhood Environment Rating Scale (ECERS, Harms & Clifford, 1980). A copy of the scale can be seen in Appendix A. The ECERS rates 37 items in the environment, divided into seven subscales: personal care routines, furnishings and displays for children, language-reasoning experiences, fine and gross motor activities, creative activities, social development and adult needs. A seven-point scale is used to rate each item. Within the scale, scores of 1, 3, 5 and 7 indicate that provision for the item is either inadequate, minimal, good, or excellent, respectively. As shown in Appendix A, the criteria for the item by item ratings are well defined. Midpoint scores of 2, 4 or 6 are assigned when an item incorporates all of the criteria for the lower rating, plus some of the criteria for the higher rating. An overall environmental quality rating is determined by the sum of the subscale scores and can range from 37, inadequate for each item, to 259, excellent for each item.

The validity of the ECERS was tested in two ways (Harms & Clifford, 1980). Seven nationally recognized experts in the field of early childhood education rated each of the scale's 38 items with respect to their importance to early childhood programs. Seventy-eight percent of the items were rated as

highly important; only one percent were considered to be relatively unimportant. As a result of the ratings, one item was dropped from the scale and minor revisions were made to several other items.

Construct validity was established in 18 classrooms between supervising teachers working in the classrooms who were naive to the ECERS and two ECERS trained observers who were unfamiliar with the classrooms prior to assessment: one with a professional background in child development, the other without such a background. Each observer independently rated each classroom according to ECERS criteria. The supervising teachers were provided with short definitions of six areas of the environment closely corresponding to those areas measured by the ECERS. They were asked to rate the six defined dimensions of their classrooms on a scale of one (low) to seven (high) according to their own criteria of quality. Rank order correlations between the supervising teachers' ratings and the total ECERS score was .74 with the child development professionals and .70 with the nonprofessional observers (Harms & Clifford, 1983). In other words, the ECERS was validated against the ratings of observers blind to the criteria of quality set forth in the ECERS. Although rudimentary, this first validation of the ECERS provides support for its use as an environmental rating scale. The authors of the scale note that the lack of universally accepted norms for early childhood environments necessitates

further work in this area.

Reliability of the ECERS was established in three ways: inter-rater and test-retest reliability and internal consistency. Twenty-five classrooms in 17 day care centres were independently rated according to ECERS criteria. Comparison of the total ECERS scores obtained by the independent raters yielded a rank order correlation of .88 (Harms & Clifford, 1983). The scale's authors did not report whether the same two raters were assigned to each classroom, or if more than two raters were involved in the study. A test of total scale consistency on the 25 classrooms yielded a Cronbach Alpha of .83. Tests of subscale consistency yielded Cronbach's Alpha ranging from .44 to .81. Low alphas were noted in the Personal Care Routines and Adult Needs subscales, prompting the authors to suggest that care be taken when interpreting subscale scores. High overall internal consistency, however, suggests that the scale is measuring a unitary concept.

A second set of 31 classrooms in 17 different day care centers were rated by child development professionals in order to examine test-retest reliability. The observers rated a classroom on two occasions, at two week intervals. During the interval other centers were rated in order to minimize the effects of observer memory on the ratings of individual items from the first to the second occasion. A correlation of .96 was reached between the first and second ratings (Harms &

Clifford, 1983). As was the case with inter-rater reliability, the number of observers involved in the test-retest reliability phase was not reported.

Verbal ability. The verbal ability of each subject was assessed by the Peabody Picture Vocabulary Test - Revised, Form L (PPVT-R, Dunn & Dunn, 1981). This is a norm-referenced, individually administered test of receptive verbal ability consisting of 5 training items and 175 test items arranged in ascending order of difficulty. The test is organized such that four simple, black-and-white illustrations are presented to the subject who is then asked to indicate the illustration best reflecting the meaning of a stimulus word presented orally by the examiner.

The authors of the PPVT-R calculated split-half reliability coefficients for 4,190 children ranging in age from 2 years 6 months to 18 years 11 months. Coefficients were obtained for 21 groups, separated by age at 6 month intervals. Five of the age groups tested correspond to the range of ages under consideration in this investigation (i.e., 3-10 to 5-6). Reliability coefficients ranged from .70 for the 4-6 to 4-11 group to .80 for the 3-6 to 3-11 group (Dunn & Dunn, 1981). Immediate test-retest reliability on alternate forms of the PPVT-R ranged from .76 to .77 for the age group in question.

The PPVT-R was constructed from vocabulary searches and cross referencing with age/grade level referenced vocabulary

lists, thus ensuring content validity. All of the words appear in Webster's New Collegiate Dictionary, (Dunn & Dunn, 1981; Mitchell, 1985). Correlation with other child ability tests such as the Wechsler Full-Scale I.Q., Stanford Binet and McCarthy Scale of Children's abilities range from .40 to .60 (Mitchell, 1985). Coefficients of predictive validity range from .30 to .80 with the Peabody Individual Achievement Test (PIAT) subscales given 11 months subsequent to PPVT-R administration (Bracken & Murray, 1984).

Socioeconomic status. The socioeconomic status of each subject's family was determined by the Home Prestige Scale (HPS) developed by Nock and Rossi (1979). Most of the commonly used measures of SES are primarily based on the occupation and education of the head of household. It has been suggested that the appropriate unit for analysis is the family rather than the individual, particularly with samples in which various family constellations are likely to be found (Mueller & Parcel, 1981; Nock & Rossi, 1979). In constructing the HPS, Nock and Rossi (1979) asked 600 adults from the Baltimore, Maryland area to rate the social standing of 60 hypothetical, computer generated, family vignettes on a scale of 1 to 9. The vignettes were constructed from randomly chosen lists of family descriptors. Forty different samples, comprised of 60 vignettes each, were randomly distributed to the respondents; thus there were 2,400 unique vignettes among the 36,000 that were rated. In order to determine which

variables the respondents considered important in the ratings, and the relative weight of each variable, the household characteristics were entered into regression equations to predict the social standing ratings in four different family constellations, single, married, divorce and widowed. The HPS is predicated on the finding that the characteristics of family members combine in different ways in social stratification depending on the family constellation. Family SES is calculated on the basis of marital status, the age, education, and occupation prestige of both parents and adult children living at home (including a prestige score for adults who are not employed outside the home), and the number of minor children in the family. Occupational prestige in the HPS is based on a method developed by Seigel that is widely used as a measure of SES in sociological research. The Seigel Prestige Scale is based on a hierarchy of occupational ratings made by the general public based on data available from survey studies conducted by the National Opinion Research Center (NORC) (Seigel, 1971; cited in Gottfried, 1985). The equations used to determine the HPS are shown in Appendix B. Mueller and Parcel (1981) report that the HPS is highly correlated with other common methods of SES determination, such as the Hollingshead Four Factor Index.

### Centres

Eleven Montreal area day care centres were selected from a list of licensed centres, published by the Quebec Office des



Service de Garde a l'Enfance, to participate in this study. Centres were selected to represent socioeconomic areas of Montreal ranging from lower to upper-middle class. Furthermore, only those centers operating primarily in English, in which the language of the majority of children is English, were selected.

The environmental ratings for each of the 11 centers are shown in Table 1. The lack of consensus regarding the integral components of a quality early childhood environment suggests that day care quality is best handled as a dichotomous variable rather than as a discrete variable. Reliability and, to some extent, validity of the scale have been tested on the basis of rank order rather than raw scores. Furthermore, based on a review of the literature to date, there is no reason to believe that ECERS scores separated by a few scale points represent meaningful differences in day care centers. The ECERS does, however, show excellent face validity particularly with regard to discriminating centers receiving low ratings from those receiving high ratings. The criteria used to arrive at the ratings for each item suggest clear, discriminable differences between items rated low and those receiving a high rating (see Appendix A). Therefore, on the basis of the ECERS ratings as defined by Harms & Clifford (1980), centers #01 through #05 were designated high quality and centers #06 through #10 were designated low quality. A center was considered high quality if it received an average

Table 1

ECERS Ratings for High, Medium and Low Quality Centres

Center	Total Score	Mean Score Per Category (Standard Deviation)	Mean Score Per Item
High Quality		214.80 (19.99)	5.8
# 01	239		
02	202		
03	230		
04	213		
05	190		
Low Quality		109.40 (15.31)	2.9
# 06	119		
07	131		
08	102		
09	93		
10	102		
Medium Quality			
# 11	166	-	4.5

rating of at least 5 (good) for each of the 37 items in the scale. Low quality centers are those which received an average of less than a 3 (minimal) for each item. A medium quality center is defined as one which averaged more than 4 (minimal) but less than 5 (good) for each item. In order to maximize the variability of environments, centre #11, rated as medium quality, was eliminated from the study.

As can be seen in Table 1, centers referred to as high quality have a mean ECERS rating of 214 (19.99). Centers referred to as low quality have a mean ECERS rating of 109.4 (15.31). These means are statistically different from one another ( $t(8) = 105.4, p < .001$ ).

### Subjects

One hundred children, 52 boys and 48 girls participated in this investigation. Twenty-four girls and 28 boys were enrolled in the five low quality centers. Twenty-four boys and 24 girls were enrolled in the five high quality centers.

All subjects met four criteria: (a) parents provided written consent, (b) they were enrolled in full-time day care at the same centre during the observation period and for at least one previous year, (c) they were age-appropriate to attend kindergarten the year following the study, (i.e., approximately 4 years of age) (d) they understood and spoke English. As noted earlier, only day care centres functioning primarily in English participated in this study; however, mother tongue of the children could not be controlled. In

order to ensure fluency in English, centre directors were asked to refer only those children who spontaneously spoke English throughout the day, i.e., their language of preference appeared to be English. Furthermore, telephone interviews with parents regarding SES were conducted in English thus ensuring that at least one parent was fluent in English.

Subjects ranged in age from 46 months to 66 months. The mean age for the sample was 49 months.

#### Procedure

The project coordinator contacted the day care directors by telephone in order to solicit their cooperation and explain the nature of the investigation. All of the directors who were contacted agreed to participate in this investigation, and a follow-up explanatory letter was sent to them (Appendix C). Letters of explanation and consent forms for parents were then delivered to the centres with the request that they be distributed to parents whose children met the criteria of the study (Appendix D). Consent forms were to be returned directly to the centre.

The PPVT-R scores, SES information and ECERS ratings were obtained simultaneously with observational data on play and social interaction that was collected as part of a larger study.

ECERS Ratings. Each center was rated on the ECERS by the project coordinator during the observation phase of the investigation. Two to four visits were made to each center

over a period of approximately two weeks. In this way, the rater had the opportunity to observe the full range of day care activities. Information regarding the adult needs subscale of the ECERS was obtained from day care directors and teachers. As a further check on the reliability established by Harms and Clifford (1980), four of the eleven centers were rated by a second female observer, the author of this thesis. Rank order correlation was in perfect agreement for these four centres.

PPVT-R administration. The procedure for test administration was designed to cause minimum disruption to daily routine and maximize subject performance. Testing was done in a quiet area of the centre during the morning "free-play" period.

The PPVT-R was administered to each child by one of three female testers: the author, the project coordinator and an honour's undergraduate student. Prior to testing, each examiner had spent several hours in each centre, thus the tester was already familiar to the children. The teacher 'formally' introduced the tester to the target child who was then invited to "play a matching game". In most cases rapport was easily established after several minutes of conversation, including a description of the "game". Children who were reluctant to accompany the tester were told they could play the game later. None of the children refused a second invitation.

The experimenter responded enthusiastically to the responses, and liberally reinforced the children for "doing such a good job". All of the children completed the test.

SES information. The project coordinator contacted parents by telephone after all phases of data collection had been completed. A copy of the SES interview questionnaire is shown in Appendix E. Parent(s) were told that some additional information was required for our investigation and they were assured of confidentiality. Two families could not be contacted by telephone. SES questionnaires were mailed to these families with the request that they be completed and sent back by return mail. One family failed to return the questionnaire. Data analyses were subsequently carried out on the 100 subjects for whom complete data were available.

## Results

This study was designed to investigate two fundamental questions regarding the relationship between day care quality, home background and children's performance on a measure of language ability. Do comprehensive measures of SES and day care quality combine to predict PPVT-R scores in a group of preschool children? Secondly, do day care quality and home background characteristics predict language performance in the same way in one-parent and two-parent families? To try and answer the questions posed by this investigation, a series of hierarchical multiple regression analyses were performed to predict children's PPVT-R scores. With respect to the second question, demographic data were subjected to a multivariate analysis of variance (MANOVA) to determine if our sample is comprised of two distinctly different subsets as a function of marital status.

### Descriptive Data for the Whole Sample

All of the children in the investigation were administered the PPVT-R (n=101) and their families were asked to complete a family background questionnaire. One family did not return the questionnaire and subsequent analyses included 100 subjects, 52 boys and 48 girls, for whom complete information was available. The global socioeconomic status (SES) rating was comprised of the following variables: mother's and father's age (MAGE, FAGE), education (MED, FED), and Seigel occupation prestige ratings (MSEIGEL, FSEIGEL),

number of minors in the home (MINORS) and marital status (MARST)<sup>1</sup>. The range, mean and standard deviation of each of these variables for the total sample are shown in Table 2. The sample includes 37 single-parent families and 63 two-parent families. Two of the single parent families indicated that custody of minor children is shared by mother and father and background information for both parents was included in the SES questionnaire. The remaining single parent families cited mother as head of household. Table 2 includes information for 100 mothers and 65 fathers.

As can be seen, there is a wide range of scores in our total sample for PPVT-R scores, SES ratings and the home background variables used to compile SES scores. The mean SES of the sample is middle class, ranging from lower to upper socioeconomic strata. A description of SES components for the whole sample by day care quality is shown in Table 3. Parents of children in low quality centres tend to be somewhat younger, less well educated, have less prestigious occupations and are more frequently single parents than are those with children in high quality day care.

#### Tests of Assumptions and Variable Selection

The data used in the following analyses were tested to ensure that all assumptions regarding multivariate statistical analyses were met. Tests of the skewness coefficients

---

<sup>1</sup> In the following analyses, marital status was dummy coded and entered in to the regressions as a dichotomous variable. (1) = two-parent families, (0) = one-parent families.



Table 2

Ranges, Mean and Standard Deviation for PPVT-R, SES & SES  
Components - Total Sample

Variable	Range	Mean	Standard Deviation
PPVT-Revised	54 - 153	98.03	19.63
Socio-Economic Status	42 - 88	60.66	11.27
Father's Age (in years)	26 - 54	36.38	5.39
Father's Education (yrs completed)	10 - 20	14.94	3.39
Father's Occupation	19 - 81	51.27	17.43
Mother's Age (in years)	23 - 43	32.50	4.69
Mother's Education (yrs completed)	7 - 21	13.93	3.41
Mother's Occupation	17 - 78	42.41	15.71
# of Minors in Household	1 - 4	1.72	.77
Marital Status		.63	.48

Table 3

Means and Standard Deviations of SES Components in High & Low Quality Centres

Variable	Low Quality		High Quality	
	Mean	(St. Dev.)	Mean	(St. Dev.)
	n = 52		n = 48	
Marital status	.49	(.50)	.86	(.35)
No. of minors	1.62	(.77)	1.83	(.75)
Mothers age	31.52	(4.68)	33.54	(4.51)
Mothers education	12.38	(2.64)	15.60	(3.38)
Mothers occupation <sup>2</sup>	39.49	(13.91)	45.58	(27.86)
	n = 27		n = 36	
Fathers age	35.25	(5.76)	37.24	(5.00)
Fathers education	12.93	(2.34)	16.46	(3.16)
Fathers occupation <sup>1</sup>	43.56	(13.20)	57.10	(18.12)

<sup>2</sup> Seigel prestige rating

revealed that the variables entered in each analysis are normally distributed. Z-score transformations and inspection of Mahalanobis distance failed to reveal any univariate or multivariate outliers. Following each multiple regression analysis, examination of the probability plot and scatterplot of residuals against predicted PPVT-R scores indicated no serious departures from linearity or homoscedasticity of residuals. With respect to the MANOVA on demographic characteristics, tests of the assumptions of normality, homogeneity of variance-covariance matrices, linearity and multicollinearity were satisfactory.

Regarding day care quality, the assumptions required for including variables in statistical analyses precluded the use of the raw ECERS scores. Children were not randomly assigned to the day care centres participating in this study. Furthermore, the total ECERS score is a constant for each child in a given centre. For these reasons, as well as the theoretical issues outlined in the Method section, day care quality was dichotomized and dummy coded for entry into the analyses. Raw ECERS scores ranging from 93 to 131 were coded 0 (low quality) and scores from 190 - 239 were coded 1 (high quality) (see Table 1).

Finally, decisions were made regarding the exclusion of sex of the child as a predictor of PPVT-R scores and the exclusion of interaction terms in the regression analyses. Previous research in Montreal area day care centres indicated

that PPVT-R scores did not vary as a function of sex of the child; therefore, sex of the subject in this study was not expected to be a significant predictor of PPVT-R scores (L'Archeveque, 1988). Furthermore, Dunn and Dunn (1981) report that sex differences were considered during test construction and norms are based on performance by both boys and girls in the standardization sample. For these reasons, and in order to minimize the number of variables in each analysis as much as possible, sex of the child was not included as a predictor of PPVT-R scores. However, exploratory regression analyses were performed which did include sex as a predictor variable. The results of the exploratory analyses are shown in Appendix F. As expected sex of the child was not a meaningful variable in any regression equation.

The decision was also made not to include interaction terms in any of the regression analyses. A discussion of the rationale behind this decision can be found in Appendix G.

By limiting the variables entered into each equation to those representing either the home background or day care quality, straightforward presentation of the results was facilitated.

#### The Combined Effects of SES and Day Care Quality

Because Nock and Rossi's HPS measure of SES is sensitive to the different family constellations using group day care facilities, the global SES score was selected as a meaningful

marker variable for home background. Descriptive statistics for SES and PPVT-R scores by centre quality can be seen in Table 4. In both day care groups, SES ranges from lower to upper class. The mean SES in low quality day care centres is lower middle class, while the mean SES in high quality centres is upper middle class. Mean PPVT-R scores are lower in low quality day care centres.

In the first analysis to be reported, the relationship between SES and PPVT-R scores alone, and in combination with day care quality, will be considered. Zero-order correlations between SES, PPVT-R and centre quality were examined in order to determine their bivariate relationship. As can be seen in Table 5, these variables are moderately correlated with one another, yet no correlation is so high as to reflect redundancy among the variables (Tabachnick & Fidell, 1983). Bonferroni correction to control for inflated alpha when performing three simultaneous pair-wise comparisons indicates that an alpha of .02 is required for significance (Miller, 1966). The inter-correlations among the three variables suggests that SES and day care quality must be considered in combination in order to permit accurate prediction of PPVT-R results.

A two-step hierarchical regression was employed to determine if the addition of information regarding the quality of day care environment improves prediction of children's PPVT-R scores beyond that afforded by knowledge of

Table 4

Ranges, Means and Standard Deviations for SES and PPVT-R in  
High & Low Quality Centres

	Low Quality n=52	High Quality n=48
<b>SES</b>		
Range	42.28 - 85.82	42.25 - 87.80
Mean	55.96	65.76
Standard deviation	(8.06)	(12.09)
<b>PPVT-R</b>		
Range	54.00 - 143.00	82.00 - 153.00
Mean	89.08	107.65
Standard deviation	(16.84)	(17.91)

Table 5

Bivariate Correlation Between SES, PPVT-R & Day Care Quality

Variables	<u>r</u>
SES - PPVT-R	.54 <sup>***</sup>
SES - day care quality	.44 <sup>***</sup>
PPVT-R - day care quality	.48 <sup>**</sup>

\*\*\*  $p < .001$  (Significant after Bonferroni correction)

socioeconomic status alone. The global SES rating was entered in the first step and centre quality (high versus low) was added to SES in the second step of the analysis. Results, as seen in Table 6, indicate that SES, when considered alone in the prediction equation, accounts for a significant proportion of the variance ( $R^2 = .29$ ,  $F(1,98) = 40.97$ ,  $p < .001$ ). In the second stage, centre quality increased the proportion of explained variance by 7% ( $R^2 = .36$ ,  $F(2,97) = 27.86$ ,  $p < .001$ ).

The standardized regression coefficient (Beta), semi-partial correlation squared (sr<sup>2</sup>), R<sup>2</sup> and adjusted R<sup>2</sup> for each step of the regression are shown in Table 6. A comparison of the squared semi-partial correlations indicates that SES accounts for 14% of the unique variance and centre quality accounts for 7% of the unique variance in PPVT-R scores. In combination, these two variables account for 36% of the variance. Comparing the standardized regression coefficients shown in Table 6, it appears that SES is weighted more heavily in the prediction equation than is the quality of a child's day care environment; however, centre quality does account for a small, but significant, unique portion of the variance. SES and day care quality are positive predictors of PPVT-R scores.

Ses Components and Day Care Quality in One-parent and Two-parent Families

Because our sample consists of different family constellations the home environments of the children differ in specifiable ways. Table 7 shows the means and standard



Table 6

Staged-hierarchical Regression Predicting PPVT-R Scores from  
SES Alone and in Combination with Day Care Quality (n = 100)

Variable	<u>Beta</u>	<u>sr<sup>2</sup></u>
<u>Step 1</u>		
SES	.54 <sup>***</sup>	.29
<u>Step 2</u>		
SES	.41 <sup>***</sup>	.14
Center quality	.29 <sup>**</sup>	.07
		R <sup>2</sup> = .36 <sup>***</sup>
		Adjusted R <sup>2</sup> = .35

\*\*\* p < .001

\*\* p < .01

Table 7

Means and Standard Deviations of Family Background Variables  
in One-parent and Two-parent Families

Variable	One-parent families		Two-parent families	
	Mean	(Std. Dev.) n = 37	Mean	(Std. Dev.) n = 63
PPVT-Revised	90.05	(18.44)	102.65	(18.92)
Socio-Economic Status	54.22	(7.12)	64.45	(11.58)
Center Quality	.32	(.48)	.57	(.50)
# of Minors in Household	1.43	(.77)	1.89	(.72)
Mother's Age	30.30	(4.91)	33.79	(4.07)
Mother's Education	11.84	(1.98)	15.16	(3.48)
Mother's Occupation	37.63	(11.89)	45.22	(17.04)
Father's Age	-	-	36.43	(5.42)
Father's Education	-	-	14.92	(3.36)
Father's Occupation	-	-	51.32	(17.71)

deviations of demographic variables for one- and two-parent families. As can be seen, compared to two-parent families, single parent families tend to be younger, less well educated, have less prestigious occupations and are more likely to enroll their children in low quality day care centres. In our sample, 37 families are single parent (mother only), and 63 families have both parents living in the home.

The next goal of this study was to determine if demographic characteristics are significantly different for two subsets of the population as a function of marital status. Accordingly, a one-way (marital status) multivariate analysis of variance (MANOVA) was performed on four variables: mother's age (MAGE), mother's education (MED), mother's occupation prestige (MSEIGEL) and number of minors in the home (MINORS). The MANOVA summary is shown in Table 8. Pillais' criterion indicated that the multivariate combination of the dependent variables was significantly different as a function of marital status ( $F(4,95) = 10.36, p < .001$ ). Because the MANOVA was performed simply to determine if division by marital status resulted in two significantly different subsets of the population, it was decided that univariate F tests were sufficient for follow-up. For the main effect of marital status (MARST), univariate tests showed mother's age, education, occupation prestige and number of minor children to be significantly different. The results of the MANOVA suggest there are two distinct subsets within the sample, thereby

Table 8

Manova Summary Table for Mother's Age (Mage), Education (Med),  
Occupation Prestige (Mseigel) & Number of Minors (Minors) in  
the Family by Marital Status (Marst)

Effect	Pillais	SS	MS	F	df	p
Marst	.304			10.36	4,95	<.001
Mage		282.37	19.33	14.61	1,98	<.000
Med		257.07	9.12	28.20	1,98	<.000
Mseigel		.11	.02	4.91	1,98	<.05
Minors		.14	.01	11.79	1,98	<.001

justifying separate one-parent and two-parent analyses of the combined effects of home background and day care quality on language performance.

The next goal of this investigation then was to determine if the home background variables and day care quality combine in the same way in two-parent versus one-parent families in the prediction of language performance. Sixty-three of the families in the sample have both parents living in the home thus background information is available for mothers and fathers. Because marital status is considered when calculating the global SES rating and is also now being used to select families for analysis, the global SES rating was not considered.

Prediction of PPVT-R scores by family background variables and day care quality; two-parent families.

Because we are considering only two-parent families in the following analysis, both father and mother background variables can be considered. The correlation matrix of two-parent family demographic variables, centre quality and PPVT-R scores is shown in Table 9. Bonferroni correction to control for inflated alpha when performing 36 pairwise comparisons suggests setting the probability at .001 for significance. Only mother's and father's education are truly representative of one another ( $r = .78$ ,  $p < .001$ ), based on Tabachnick and Fidell's (1983) criterion for redundancy between variables.

In two-parent families the presence of a father in the

Table 9

Bivariate Correlations Between PPVT-R, Centre Quality and Home Background Variables; Two-parent Families (n

= 63)

	Center Quality	Father's Age	Father's Education	Father's Occupation	Mother's Age	Mother's Education	Mother's Occupation	# of Minors
Father's Age	.16							
Father's Education	.53***	.07						
Father's Occupation	.39***	.17	.70***					
Mother's Age	.26*	.54***	.28*	.34**				
Mother's Education	.46***	.06	.78***	.55***	.31**			
Mother's Occupation	.18	.08	.25*	.28*	.21*	.45***		
# of Minors in Household	.18	.05	.18	.01	.23*	.15	.03	
PPVT- Revised	.39***	.12	.56***	.45***	.03	.46***	.35**	.08

\*\*\* p &lt; .001 (Significant after Bonferroni correction)

\*\* p &lt; .01

\* p &lt; .05

home as an influential factor in children's language performance cannot be overlooked. However, only mother-related variables will allow comparison between the one-parent and two-parent families. For this reason two separate staged-hierarchical multiple regression analyses will be reported. The first will consider only mother's age, education and occupation and the second will use these variables for both mother and father to predict PPVT-R scores.

Two-parent families, mother-related variables. Results of the first step of the two-step staged hierarchical multiple regression using mother variables as predictors of PPVT-R scores, shown in Table 10, indicate that the combined effects of the three home background variables, independent of centre quality, account for a significant proportion of the variance in PPVT-R scores ( $R^2 = .25$ ,  $F(3,59) = 6.65$ ,  $p < .001$ ). Adding day care quality to the equation in the second stage increased the amount of explained variance by 6% ( $R^2 = .31$ ,  $F = 6.36$ ,  $p < .001$ ). The standardized regression coefficients (Beta), squared semi-partial correlations (sr<sup>2</sup>), R<sup>2</sup> and adjusted R<sup>2</sup> for the full regression model are shown in Table 10. Of the four variables in the final stage of the equation, mother's education and quality of the day care environment contribute a significant unique proportion of variance (sr<sup>2</sup> = .06,  $p < .05$ ; sr<sup>2</sup> = .05,  $p < .05$  respectively) and are positive predictors of PPVT-R scores.

Table 10

Staged-hierarchical Regression Predicting PPVT-R from SES  
Components Alone & in Combination with Day Care Quality; Two  
Parent Families (n = 63)

Variable	<u>Beta</u>	<u>sr<sup>2</sup></u>
<u>Step 1</u>		
Mother's age	-.14	.02
Mother's education	.42 <sup>**</sup>	.13
Mother's occupation prestige	.19	.03
		Adjusted R <sup>2</sup> = .25 <sup>***</sup>
		Adjusted R <sup>2</sup> = .21
<u>Step 2</u>		
Mother's age	-.18	.03
Mother's education	.30 <sup>*</sup>	.06
Mother's occupation prestige	.20	.03
Center quality	.26 <sup>*</sup>	.05
		Adjusted R <sup>2</sup> = .31 <sup>***</sup>
		Adjusted R <sup>2</sup> = .26

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



Two-parent families, mother- and father-related variables. As indicated in the correlation matrix, the only redundant demographic variables are mother's and father's education. In order to avoid the problems of multicollinearity and singularity posed by inclusion of highly correlated variables in the same analysis, mother's education will be considered representative of the family education level (Tabachnick & Fidell, 1983). A two-step staged hierarchical multiple regression analysis was used to predict PPVT-R scores by the combination of mother's education, and both father's and mother's age and occupation prestige entered in the first step and centre quality entered in the second step. As can be seen in Table 11, the combination of these home background variables accounts for 33% of the variance in PPVT-R scores ( $R^2 = .33$ ,  $F(5,57) = 5.58$ ,  $p < .001$ ). When both father and mother variables are considered in the equation, independent of centre quality, the significant predictor of PPVT-R scores is father's occupation prestige. As seen in Table 11, father's occupation accounts for 8% of the unique variance and is the only significant variable in the prediction equation ( $sr^2 = .08$ ,  $Beta = .34$ ,  $t = 2.53$ ,  $p < .05$ ), although mother's education approaches significance ( $t = 1.80$ ,  $p = .08$ ). The addition of centre quality to the equation increases the amount of explained variance in PPVT-R scores by only 4% ( $R^2 = .37$ ,  $F(6,56) = 5.45$ ,  $p < .001$ ). When both father's and mother's demographic

Table 11

Staged-hierarchical Regression Predicting PPVT-R from SES  
Components Alone & in Combination with Day Care Quality; Two  
Parent Families; Mother and Father Variables (n = 63)

Variable	<u>Beta</u>	<u>sr<sup>2</sup></u>
<u>Step 1</u>		
Mother's age	-.12	.01
Mother's education	.14	.04
Mother's occupation prestige	.15	.02
Father's age	-.13	.01
Father's occupation prestige	.34 <sup>*</sup>	.08
		Adjusted R <sup>2</sup> = .33 <sup>***</sup>
		Adjusted R <sup>2</sup> = .27
<u>Step 2</u>		
Mother's age	-.13	.01
Mother's education	.17	.02
Mother's occuaption prestige	.16	.02
Father's age	-.15	.02
Father's occupation prestige	.30 <sup>*</sup>	.06
Center quality	.23	.04
		Adjusted R <sup>2</sup> = .37 <sup>***</sup>
		Adjusted R <sup>2</sup> = .30

\*\*\* p < .001

\* p < .05

characteristics are used to predict PPVT-R scores along with centre quality, the only significant predictor is father's occupation prestige ( $sr^2 = .06$ ,  $Beta = .30$ ,  $t = 2.25$ ,  $p < .05$ ). Centre quality approaches significance in the equation ( $t = 1.99$ ,  $p = .07$ ). Children whose fathers have more prestigious occupations and are enrolled in high quality day care have higher PPVT-R scores.

SES components and day care quality in one-parent families. As was shown in Table 7, one parent families are younger, less well educated and have less prestigious occupations than their counterparts in two-parent families. Children from one-parent families have lower PPVT-R scores than those from two-parent families.

An examination of the correlation matrix for one-parent family variables, shown in Table 12, indicates no redundant variables. Bonferroni correction to control for inflated alpha when performing 10 pairwise comparisons indicates setting the probability at .002 for significance. Inclusion of mother's age, education and occupation prestige, in the regression analysis will allow direct comparison of the equations between one- and two-parent families. The three mother related variables, along with centre quality will therefore be included in the equation.

A two-step staged hierarchical multiple regression was performed to predict Peabody scores, entering mother's age, education, and occupation prestige in the first step of the

Table 12

Bivariate Correlations Between PPVT-R, Center Quality and Home Background Variables: One-parent Families(n = 37)

	Center Quality	Mother's Age	Mother's Education	Mother's Occupation
Mother's Age	.03			
Mother's Education	.35*	.12		
Mother's Occupation	.06	.06	.33*	
PPVT- Revised	.52***	.49***	.30*	.20

\*\*\*  $p < .001$  (Significant after Bonferroni correction)\*  $p < .05$

equation. Day care quality was added to the home background variables in the second step. Results of the full model can be seen in Table 13. At the first stage of the analysis, the combination of the three mother-related variables accounts for 38% of the variance in Peabody scores ( $R^2 = .38$ ,  $F(3,33) = 6.74$ ,  $p < .01$ ); the significant predictors of Peabody scores being mother's age and education. Examination of the squared semi-partial correlations indicates that the unique variance contributed by mother's age is 28% and by mother's education is 9% ( $sr^2 = .28$ ,  $\beta = .53$ ,  $t = 3.85$ ,  $p < .001$ ;  $sr^2 = .09$ ,  $\beta = .32$ ,  $t = 2.22$ ,  $p < .05$ ).

The addition of day care quality in the second stage of the analysis increases the amount of explained variance in PPVT-R scores by 19% over the amount explained when family background variables were entered alone ( $R^2 = .57$ ,  $F(4,32) = 10.80$ ,  $p < .001$ ). In the full model both mother's age and centre quality contribute significant unique variance to language scores ( $sr^2 = .27$ ,  $\beta = .53$ ,  $t = 4.53$ ,  $p < .001$ ;  $sr^2 = .19$ ,  $\beta = .57$ ,  $t = 3.83$ ,  $p < .001$  respectively).

#### Summary of Results

The goal of this investigation was twofold: (1) to determine if a comprehensive measure of SES is a useful marker variable in combination with day care quality in the prediction of PPVT-R scores and (2) to determine if demographic variables and day care quality combine in the same way in one-parent and two-parent families. Four separate

Table 13

Staged-hierarchical Regression Predicting PPVT-R from SES  
Components Alone & in Combination with Day Care Quality; One  
Parent Families (n = 37)

Variable	<u>Beta</u>	<u>sr<sup>2</sup></u>
<u>Step 1</u>		
Mother's age	.53 <sup>***</sup>	.28
Mother's occupation prestige	.12	.01
Mother's education	.32 <sup>*</sup>	.09
		R <sup>2</sup> = .38 <sup>**</sup>
		Adjusted R <sup>2</sup> = .32
<u>Step 2</u>		
Mother's age	.53 <sup>***</sup>	.27
Mother's occupation prestige	.15	.02
Mother's education	.15	.02
Center quality	.47 <sup>***</sup>	.19
		R <sup>2</sup> = .57 <sup>***</sup>
		Adjusted R <sup>2</sup> = .52

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

staged hierarchical multiple regression analyses were performed to predict PPVT-R scores by (1) global SES rating alone and in combination with day care quality for the whole sample, (2) mother-related background variables for two-parent families alone and in combination with day care quality, (3) mother- and father-related background variables for two-parent families alone and in combination with day care quality, and (4) mother-related background variables in one-parent families. Results of a MANOVA indicate that one-parent and two-parent families comprise significantly different subsets of the sample with regard to age, education and occupation prestige, thereby providing justification for the separate analyses on the basis of marital status.

In each analysis, day care quality was entered at the final step of the equation in order to assess the contribution of quality of the day care environment to the prediction of PPVT-R scores over that allowed by inclusion of family background alone.

Table 14 shows a summary of the final step of each of the four regression analyses. The results of each of the staged-hierarchical multiple regression analyses using data from the whole sample indicate that the addition of day care quality to the equation improves prediction of PPVT-R scores over that obtained by SES or SES components alone. In the final step of the first equation, combining a measure of SES with day care quality indicated that both SES and centre quality are

Table 14

Summary of Staged-hierarchical Regression Analyses Predicting  
PPVT-R Scores in the Whole Sample, Two-parent Families & One-  
parent Families

	<u>Beta</u>	<u>sr<sup>2</sup></u>	<u>R<sup>2</sup></u>	<u>R<sup>2</sup> Change<sup>3</sup></u>
<u>Equation 1 (Table 6); Whole Sample, n = 100</u>				
SES	.41***	.14		
Center quality	.29**	.07	.36***	.07**
<u>Equation 2 (Table 10); Two-parent families, n = 63</u>				
Mother's age	-.18*	.03		
Mother's education	.30	.06		
Mother's occupation	.20*	.03		
Center quality	.26*	.05	.31***	.05*
<u>Equation 3 (Table 11); Two-parent families, n = 63</u>				
Mother's age	-.13	.01		
Mother's education	.17	.02		
Mother's occupation	.16	.02		
Father's age	-.15*	.02		
Father's occupation	.30	.06		
Center quality	.12	.04	.37***	.04
<u>Equation 4 (Table 13); One-parent families, n = 37</u>				
Mother's age	.53***	.27		
Mother's education	.15	.02		
Mother's occupation	.15***	.02		
Center quality	.57***	.19	.57***	.19***

<sup>3</sup> Change from step one, after addition of center quality to the equation.



significant predictors of language performance. PPVT-R scores increase with higher SES and higher day care quality.

In the case of two-parent families the increase in  $R^2$  with the inclusion of centre quality was relatively small in the analysis including mother-only variables and in the analysis including both mother and father variables. The multivariate combination of mother and father variables, plus day care quality, accounted for 37% of the variance in PPVT-R scores, while the combination of mother-only variables and day care quality explained 31% of the variance.

The inclusion of centre quality with mother-related variables in one-parent families resulted in the largest increase in  $R^2$  over that given by family variables alone ( $R^2$  change = 19%). The only instance in which centre quality was not a significant predictor of PPVT-R scores occurred in the two-parent family equation which included both father and mother variables.

### Discussion

It has only been within the last decade that researchers investigating the effects of day care have taken a multivariate approach toward examining the relationship between environmental differences in the home and in the day care and a variety of outcome measures. The first goal of this study was to determine whether day care quality, in combination with SES, would be an important predictor of language comprehension scores when three conditions were met: (1) a global measure of day care quality was used; (2) the day care settings sampled represented a wide range of quality; and (3) a comprehensive measure of SES was used. Under these conditions, knowledge of day care quality did improve the prediction of language performance in four year olds. The finding that knowledge of day care quality, as measured by Harm's and Clifford's (1980) Early Childhood Environment Rating Scale (ECERS), facilitates the prediction of language performance contradicts the results from two other major North American investigations (Goelman & Pence, 1987a, 1987b; Kontos, 1987). The outcome of this study is, however, in agreement with a major inquiry conducted in Bermuda (McCartney, 1984).

There are several possible reasons for the discrepancy in findings regarding the relationship of day care quality and outcome measures. Perhaps the most compelling of these concerns the variability of day care quality, as measured by

the ECERS, across the investigations in question. In those studies which failed to find an effect of centre quality, the range of day care quality was restricted. Examination of the mean centre quality reported by Goelman and Pence (1987a, 1987b) and Kontos (1987) indicated that their centres were within a fairly narrow range of middle quality day care. In Bermuda, where McCartney (1984) found centre quality to be a significant predictor of language performance, the sample included a wide range of quality ratings. Like the McCartney (1984) study, the results reported in this investigation are based on a wide range of day care quality as assessed by the ECERS; and, like McCartney's results, day care quality is predictive of language performance.

Random selection of day care centres in Pennsylvania and in Victoria, B.C. resulted in a sample representative of day care quality in these areas. In the rural and medium sized urban areas of North America sampled, day care quality is best described as near the middle of the ECERS scale in many centres. Under these conditions, the relationship of centre quality to outcome measures is constant. Care must be taken not to conclude that day care quality had no effect in these centres: its effect was simply similar across a variety of home environments. It cannot be assumed that the constant effect is also the optimal effect; nor can one conclude that a random sampling of day care in large urban areas will result in the same plethora of middle quality day care.

One can speculate that, given adequate contrast groups in Pennsylvania and Victoria, B.C., day care quality may have been predictive of outcome measures. In a large urban area such as Montreal an equal number of low and high quality day care was sampled with very little effort and clearly represents the range of available care, although the selection procedure may not represent the majority of centres. An adequate range of quality should be included in the sample in order to investigate its effects. When the range of quality is adequately represented, it can be demonstrated that day care quality is an important predictor of language comprehension of four year olds attending day care programs.

Day care quality acts in combination with home environment in predicting vocabulary scores. The current investigation differs from all of the previous work in the area in its selection of a comprehensive SES measure as indicative of home environment. Moreover, the specific SES measure used is unique in that it utilizes information about both maternal and paternal characteristics as well as taking family structure into account. Unlike such widely used SES measures as the Seigel Occupation Prestige Score, which considers only the head of household, or the Hollingshead Four Factor Index which simply adds the characteristics of a married couple and divides the result in half, the HPS calculation assigns different weights to the family characteristics depending on marital status. As Mueller and

Parcel (1981) and Gottfried (1985) note, in research investigating the relationship of home background to some aspect of development or performance, it may be more realistic to use an SES measure which reflects such a fundamental difference as the number of parents available in the home.

These results suggest that in a large urban area such as Montreal, day care quality is predictive of a measure of language performance for a group of children from divergent socioeconomic strata attending day care centres of varying quality. Children from higher socioeconomic classes have better language scores than do those from less advantaged groups. Furthermore, children enrolled in high quality day care have better scores on the PPVT-R than do children in low quality centers. Given the significance of the multivariate combination of SES and day care quality in predicting PPVT-R scores it seems that enrollment in high quality day care may be particularly important for lower SES children, who may already be linguistically disadvantaged as a function of their home environments.

While these results lend strong support for the idea that SES and quality of day care have an important impact on language comprehension it is possible that the combined home/day care influence is dissimilar as a function of particular family characteristics. Maternal attributes are frequently selected for examination over paternal characteristics, or SES measures, because the majority of

families have a mother in the home while a father may, or may not, be present. As illustrated in the correlation matrix shown in Table 4, however, it is apparent that demographic characteristics of the mother in a family are not necessarily representative of all the family variables. Furthermore, the assumption that the relationship of maternal background variables to language performance is the same regardless of the family structure may be inappropriate.

Based on the observation of disparate demographic variables in one- and two-parent families, the second goal of this investigation was to determine if realistic appraisal of the multivariate relationship between home background, day care quality and outcome measures would differ if one-parent and two-parent families were considered separately. The absence of a father in the home, in addition to differences in mothers' demographics, suggests variability in environmental stimuli for children in one-parent and two-parent families which may differentially affect language performance. Despite the unequivocal differences that family structure imposes on the home background no one in the day care field has yet analyzed their data on the basis of family structure. Given the trend toward the increased use of day care, and the trend toward an increase in one-parent households, family structure appears to be of particular importance in day care research.

In fact, the separate one-parent/two-parent analyses reported here did reveal striking differences in the way in

which home background and day care quality combine to predict PPVT-R scores. In two-parent families, the relationship between home background and PPVT-R scores is quite pronounced. This effect is particularly notable when both fathers' and mothers' demographics are included in the equation. When mother only is included in the prediction, her education carries slightly more weight than does centre quality, although both are significant, positive predictors of PPVT-R scores. With more complete information regarding the characteristics of two-parent families, i.e., inclusion of both mother and father related variables, the addition of day care quality fails to significantly increase the amount of explained variance in PPVT-R scores.

In summary, when only mother's demographic characteristics and day care quality for the two-parent family subset are entered into the full equation 31% of the variance in PPVT-R scores is explained and mother's education and centre quality are significant predictors. When both mother and father characteristics are included, 37% of the variance is explained, the only significant, individual, predictor being father's occupation. It appears that the combination of background variables, both home and day care, is more important than any one characteristic alone.

The pattern of significant predictors of PPVT-R scores in one-parent families is quite different from that in two-parent families. The inclusion of day care quality in the equation

for the one-parent family subset increases the amount of explained variance in Peabody scores by 19% over that explained by mother's demographic characteristics alone. Two significant predictors of PPVT-R emerge, mother's age and centre quality. Each of these variables accounts for a large unique proportion of the variance in language performance (27% and 19%, respectively) compared to less than 7% from any one variable in the two-parent families. It is difficult to explain the significance of mother's age as a predictor of language performance in this particular sample. Although single mothers are somewhat younger than their married counterparts, they seem not to be inordinately young. For example, single mothers participating in this investigation were approximately 25 or 26 years old when the subject children were born compared to 28 or 29 years of age for mothers with a partner living in the home. The most likely explanation is that mother's age in one-parent families serves as a marker variable for differences in home background, other than those already included in the equation.

The dissimilar patterns of regression coefficients for the prediction of PPVT-R scores in one-parent and two-parent families represents a significant contribution to the day care literature. Children from single parent families are over represented in low quality day care centres, both in this sample and in the reports of other day care researchers; yet, it is for this group that family background appears to be less



influential and day care quality takes on greater importance in predicting performance on a measure of language competence.

There are several possible explanations for the contrasting results between one-parent and two-parent families, including methodological or statistical artifacts such as the use of a dichotomous variable to represent day care quality, a restricted range of day care quality, or perhaps a limited range in the home background variables.

By dichotomizing day care quality, subtle differences in the environment that may be reflected in raw ECERS scores are lost. Given the robust effect of day care quality, however, this appears not to have affected these results. With respect to range of quality, although there are slightly more two-parent families in high quality day care, this variable is not significantly skewed, i.e., there is a normal distribution of two-parent families across quality. One-parent families are over represented in low quality centres, however. Finally, two-parent families are better educated, have more prestigious occupations and are somewhat older than are single parents. Better educated parents do choose better quality day care, be they single mothers or two-parent families. Parental education may serve as a marker for differences in family background which are related to centre selection but have not been identified in this study.

It should also be noted, however, that the single mothers whose children are in high quality day care average only 1.47

years of additional education over the single mothers whose children are in low quality day care yet their children evidence much better language performance. In a smaller study (38 children in 9 day care centres) in Montreal, L'Archeveque (1988) examined the PPVT-R scores of a sample of lower SES children in high and low quality day care. In that study, analysis of variance revealed a small but significant effect of centre quality on language performance. Similarly, McCartney, Scarr, Phillips and Grajek (1985) reanalyzed their Bermuda data, matching children on demographic variables and including only children from lower SES backgrounds. Those children attending high quality day care had significantly higher PPVT-R scores than did the group of matched controls attending low quality day care.

The results reported here most likely reflect the fact that day care quality has a greater impact on the language of children from one-parent families than is seen in the language performance of children from two-parent families. What seems likely, is that two-parent families are able to provide the environment required to firmly establish a developmentally appropriate vocabulary. Enrollment in low quality day care does not erode what has been learned. In the case of children from one-parent families, enrollment in low quality day care will not ameliorate language deficits making quality day care of prime importance for these children.

### Directions for future research

Each of the day care centres participating in this investigation was licensed by the Province of Quebec, yet there appears to be a wide range of quality, as measured by the ECERS. Susan Kontos' (1987) work in Pennsylvania suggests that licensing standards represent one aspect of the environment, while comprehensive quality indices such as the ECERS represent another. One of the problems with the ECERS, despite its face validity, is the structure of the instrument. Because different facets of the environment contributing to the quality rating are embedded within the different subscales, it is impossible to tease apart those factors which may be the most relevant. The results of this study suggest that a comprehensive measurement of day care quality such as the ECERS does differentiate between high and low quality day care centres and that the resulting high/low dichotomy can be used to predict outcome. Future work should be directed toward refinement of the ECERS or development of a new instrument which can identify those features of the environment most related to outcome measures. Quality clearly makes a difference; however, those aspects of the day care environment which facilitate language performance have yet to be defined.

The results presented here suggest that a measure of socioeconomic status which is sensitive to family structure can serve as an effective marker variable regarding the

influence of family background on measures of development or performance. Based on this investigation, family structure is clearly an important variable to consider in future research as the relationship between day care quality and language performance varies with different family structure. Moreover, our knowledge of the home/day care relationship depends to a large extent on the variables used in the analysis. To date, however, we can only speculate as to the features of the home environment which are related to this differential effect.

In the future, researchers must carefully consider that differences in family structure may represent differences in home environment which are not tapped by general measures of socioeconomic status or by demographic variables. Ideally, future research on the multivariate effect of day care quality and home background on language performance would benefit from finely tuned observational work at home and in the day care in combination with standardized outcome assessment, like the PPVT-R used here. Furthermore, testing of language performance prior to any day care experience and then again after at least one year of day care is a worthwhile goal for future research. Such pre-post test designs are notably lacking in the literature and could help to differentiate those differences related to home background, including family structure, and those differences in performance due to the combined effects of home and day care environments.

### Summary

Taken together, the results of this investigation indicate that quality of day care is an important variable to consider when investigating children's language achievement. Additionally, the findings suggest that the pattern of influence of day care is different for children from disparate family backgrounds. Clearly those children who could benefit the most from a day care environment which facilitates language development are the least likely to be enrolled in the kind of day care centres which can provide an environment conducive to optimal development. These children may be at a disadvantage during the transition from day care to our verbally oriented school system.

The findings presented here confirm and extend the ideas espoused in the compensatory education literature. The effect of day care quality on language performance appears to be most substantial for children from one-parent families whose mothers are less well educated, have less prestigious occupations and, by implication, may have fewer language stimulation resources in the home.

Quality in day care does seem to make a difference, as evidenced by the results reported here and elsewhere (for example, McCartney, 1984). Clearly, good quality day care for all children is a worthwhile goal and seems to be of particular importance for children from less advantaged home environments. The trend toward the increase use of group day

care facilities is likely to continue given our economic structure. Providing high quality day care may prove to be an effective intervention strategy for children at risk for optimal development. Recently, home intervention programs have been inaugurated with a view toward amelioration of developmental deficit. The results from this investigation, however, suggest that once a child is in day care, both the home and day care environments are important. Moreover, Scarr and McCartney (1988) have demonstrated that home intervention programs may be inadequate for children in full-time group care. Putting our efforts into the establishment of high quality day care centres will likely provide the most benefit to the majority of children.

## References

- Ainsworth, M.D.S. & Wittig, B.A. (1969). Attachment and exploratory behavior of one-year-olds in a strange situation. In B.M. Foss (Ed.), Determinants of infant behavior. Vol. 4. London: Methuen.
- Anastasi, A. (1958). Heredity, environment, and the question "How"? Psychological Review, 65, 197-208.
- Bee, H.L., VanEgeren, L.F., Streissguth, A.P., Nyman, V.A., & Leckie, M.S. (1969). Social class differences in maternal teaching strategies and speech patterns. Developmental Psychology, 1(6), 726-734.
- Belsky, J. (1984). Two waves of day care research: Developmental effects and conditions of quality. In R.C. Ainslie (Ed.), The Child and the Day Care Setting. N.Y.: Praeger.
- Belsky, J. & Steinberg, L.D. (1978). The effects of day care: A critical review. Child Development, 49, 929-949.
- Belsky, J., Steinberg, L.D., & Walker, A. (1982). The ecology of day care. In M.E. Lamb, Non-traditional families: Parenting and child development. Hillsdale, N.J.: Lawrence Erlbaum.
- Biemiller, A., Avis, C., & Lindsay, A. (1976, June). Competence supporting aspects of day care environments- A preliminary study. Paper presented at the Canadian Psychological Association Convention, Toronto.
- Blanchard, M. & Main, M. (1979). Avoidance of the attachment figure and social-emotional adjustment in day care infants. Developmental Psychology, 15, 445-446.
- Bowlby, J. (1951). Maternal care and mental health. Geneva: World Health Organization.
- Bracken, B.A. & Murray, A.M. (1984). Stability and predictive validity of the PPVT-R over an eleven month interval. Educational & Psychological Research, 4(1), 41-44.
- Caldwell, B. M., Wright, C.M., Honnig, A.S., & Tannenbaum, J. (1970). Infant care and attachment. American Journal of Orthopsychiatry, 40, 397-412.
- Clarke, A.M. & Clarke, A.D.B. (1976). Early experience: Myth and evidence. New York: The Free Press.

- Clarke-Stewart, K.A. (1978). And daddy makes three: The father's impact on mother and young child. Child Development, 49, 466-478.
- Clarke-Stewart, K.A., & Gruber, C.P. (1984). Day care forms and features. In R.C. Ainslie (Ed.), The child and the day care setting: Qualitative variations and development. New York: Praeger.
- Cochran, M.M., (1977). A comparison of group day and family child-rearing patterns in Sweden. Child Development, 48, 702-707.
- Condry, S. (1983). History and background of preschool intervention programs and the consortium for longitudinal studies. In The Consortium for Longitudinal Studies, As the Twig is Bent ... Lasting Effects of Preschool Programs. Hillsdale, N.J.: Lawrence Erlbaum.
- Cross, T.G. (1977). Mothers' speech adjustments: The contributions of selected child listener variables. In C. Ferguson and C. Snow (Es.), Talking to children: Language input and acquisition. Cambridge: Cambridge University Press.
- de Villiers, J.G., & de Villiers, P.A. (1978). Language acquisition. Cambridge, Mass.: Harvard University Press.
- Doyle, A.-B. (1975). Infant development in day care. Developmental Psychology, 11, 655-656.
- Doyle, A.-B., & Somers, K. (1978). The effects of group and family day care on infant attachment behaviours. Canadian Journal of Behavioural Science, 10(1), 38-45.
- Dunn, L.M. & Dunn, L.M. (1981). Peabody Picture Vocabulary Test. Circle Pines, Minn.: American Guidance Service.
- Gleitman, L.R., (1981). Maturational determinants of language growth. Cognition, 10, 103-114.
- Goelman, H. & Pence, A. (1987a). Effects of child care, family, and individual characteristics on children's language development: The Victoria Day Care Research Project. In D.A. Phillips (Ed.), Quality in child care: What does research tell us? (pp. 87-104). Washington, D.C.: National Association for the Education of Young Children.



- Goelman, H. & Pence, A. (1987b). Some aspects of the relationships between family structure and child language development in three types of day care. In D.L. Peters and S. Kontos (Eds.), Continuity and discontinuity of experience in child care. Annual advances in applied developmental psychology (Vol. 2). Norwood, N.J.: Ablex.
- Goldfarb, W. (1943). The effects of early institutional care on adolescent personality. Journal of Experimental Education, 12, 106-129.
- Gottfried, A.W. (1985). Measures of socioeconomic status in child development research: Data and recommendations. Merrill-Palmer Quarterly, 31(1), 85-92.
- Gunnarson, L. (1978). Children in day care and family care in Sweden: A follow-up. Bulletin No. 21, Department of Educational Research, University of Gothenburg, Sweden.
- Harms, T. & Clifford, R.M. (1980). Early childhood environment rating scale. New York: Teachers College Press.
- Harms, T. & Clifford, R.M. (1983). Assessing preschool environments with the early childhood environment rating scale. Studies in Educational Evaluation, 8, 261-269.
- Hess, R.D. & Shipman, V. (1965). Early experiences and the socialization of cognitive modes in children. Child Development, 36, 869-886.
- Hess, R.D. & Shipman, V. (1967). Cognitive elements in maternal behavior. In J.P. Hill (Ed.), Minnesota symposium on child psychology (Vol. 1). Minneapolis: University of Minnesota Press.
- Hess, R.D. & Shipman, V. (1968). Maternal influences upon early learning: The cognitive environments of urban pre-school children. In R. Hess & R.M. Bear (Eds.), Early Education. Chicago: Aldin.
- Howes, C. & Olenick, M. (1986). Family and child care influences on toddler's compliance. Child Development, 57, 202-216.
- Hunt, J.M. (1961). Intelligence and Experience. New York: Ronald.
- Hunt, J.M. (1964). The psychological basis for using pre-school enrichment as an antidote for cultural deprivation. Merrill-Palmer Quarterly, 10, 209-248.

- Ives, W. (1980). Preschool children's ability to coordinate spatial perspectives through language and pictures. Child Development, 51, 1303-1306.
- Jenkins, J.J. (1969). The acquisition of language. In D.A. Goslin (Ed.), Handbook of socialization theory and research. Chicago: Rand McNally.
- Kagan, J., Kearsely, R.B., & Zelazo, P.R. (1978). Infancy: Its Place in Human Development. Cambridge: Harvard University Press.
- Kontos, S., & Fiene, R. (1987). Predictors of quality and children's development in day care. In D. Phillips (Ed.), NAEYC Research Monograph.
- Kontos, S., & Stevens, R. (1985). High quality child care: Does your center measure up? Young Children, January, 5-9.
- L'Archeveque, L. (1988). The Effect of Quality of Day Care Environment on the Development of Language in Preschoolers. Unpublished undergraduate honour's thesis, Concordia University, Montreal.
- Lazar, I. & Darlington, R. (1982). Lasting effects of early education: A report from the consortium for longitudinal studies. Monographs of the Society for Research in Child Development, 47.
- Lieberman, A.F. (1979). Psychology and day care. Social Research, 45, 416-451.
- McCartney, K. (1984). Effect of quality of day care environment on children's language development. Developmental Psychology, 20(2), 244-260.
- McCartney, K., Scarr, S., Phillips, D., Grajek, S. (1985). Day care as intervention: Comparisons of varying quality programs. Journal of Applied Developmental Psychology, 6, 247-260.
- McCartney, K., Scarr, S., Phillips, D., Grajek, S. & Schwarz, J.C. (1982). Environmental differences among day care centers and their effects on children's development. In E.F. Zigler & E.W. Gordon (Eds.), Day Care, Scientific and Social Policy Issues. Boston: Auburn House. (Chapter 6).
- Mitchell, J.V. Jr., (1985). The ninth mental measurements yearbook. Lincoln: Univ. of Nebraska Press.

- Moskowitz, D., Schwarz, J. & Corsini, D. (1977). Initiating day care at three years of age: effects on attachment. Child Development, 48, 1271-1276.
- Mueller, C.W., & Parcel, T.L. (1981). Measures of socioeconomic status: Alternatives and recommendations. Child Development, 52, 13-30.
- Nock, S.L. & Rossi, P.H. (1979). Household types and social standing. Social Forces, 57, 1325-1345.
- O'Connell, J.C. (1983, January). Children of working mothers: What the research tells us. Young Children, 62-70.
- Peters, D.L., Neisworth, J.T., & Yawkey, T.D. (1985). Early childhood education: From theory to practice. Monterey, CA.: Brooks/Cole.
- Phillips, D.A. & Howes, C. (1987). Indicators of quality in child care: Review of Research. In D.A. Phillips (Ed.). Quality in child care: What does research tell us? (pp. 1-19. Washington, D.C.: National Association for the Education of Young Children.
- Phillips, D., McCartney, K., & Scarr, S. (1987). Child-care quality and children's social development. Developmental Psychology, 23(4), 537-543.
- Portnoy, F. & Simmons, C. (1979). Day care and attachment. Child Development, 49, 239-242.
- Prescott, E. (1981). Relations between physical setting and adult/child behavior in day care. Advances in Early Education and Day Care, 2, 129-158.
- Ramey, C.T., Dorval, B., & Baker-Ward, L. (1983). Group day care and socially disadvantaged families: Effects on the child and the family. In S. Kilmer (Ed.), Advances in Early Education and Day Care (Vol. 3), pp. 69-106. Greenwich, Conn.:JAI.
- Rhodes, L. (1986). What dimensions of group day care settings have been empirically or theoretically related to children's social and emotional development? What does this literature tell us about defining and measuring the quality of day care settings? Unpublished manuscript, Concordia University.
- Ricciuti, H. (1974). Fear and development of social attachments in the first year of life. In M. Lewis and L.A. Rosenblum (Eds.), The origins of human behavior: fear. New York: Wiley.

- Rohe, W., & Patterson, A.H. (1974). The effects of varied levels of resources and density of behavior in a day care center. In D. Carson (Ed.), Man-Environment Interactions. EDRA.
- Roopnarine, J.L., & Lamb, M.E. (1978). The effects of day care on attachment and exploratory behavior in a strange situation. Merrill-Palmer Quarterly, 24(2), 85-95.
- Ruopp, R., Travers, J., Glantz, F. & Coelen, C. (1979). Children at the Center: Summary Findings and Their Implications. Final Report of the National Day Care Study. Vol. 5. Cambridge: Abt Associates.
- Rutter, M. (1981). Social-emotional consequences of day care for preschool children. American Journal of Orthopsychiatry, 51(1), 4-28.
- Rutter, M. (1985). Family and school influences on cognitive development. Journal of Child Psychology and Psychiatry, 26(5), 683-704.
- Scarr, S. & McCartney, K. (1988). Far from home: An experimental evaluation of the mother-child home program in Bermuda. Child Development, 59 (3), 531-543.
- Schwarz, J.C., Strickland, R.G., & Krolick, G. (1974). Infant day care: behavioral effects at preschool age. Developmental Psychology, 10, 502-506.
- Spitz, R.A. (1945). Hospitalism: an inquiry into the genesis of psychiatric conditions in early childhood. Psychoanalytic Study of the Child, 1, 53--74.
- Spitz, R.A. (1946a). Hospitalism: a follow-up report. Psychoanalytic Study of the Child, 2, 113-117.
- Spitz, R.A. (1946b). Anaclitic depression. Psychoanalytic Study of Child, 2, 313-342.
- Spock, B.J. (1946). Baby and child care (2nd ed.). New York: Simon & Schuster.
- Spock, B.J. (1967, June). When a mother goes to work. Redbook, 60-63.
- Tabachnick, B.G. & Fiell, L.S. (1983). Using multivariate statistics. New York: Harper and Row.
- Vandall, D.L., & Powers, C.P. (1983). Day care quality and children's free play activities. American Journal of Orthopsychiatry, 53(3), 493-500.

Wachs, T.D. & Gruen, C.E. (1982). Early experience and human development. New York: Plenum.

White, B.L. (1975). The first three years of life. Englewood Cliffs, N.J.: Prentice-Hall.

White, B.L., (1981). Viewpoint. Should you stay home with your baby? Young Children, 37(1), 11-17.

**Appendix A**

**Harms & Clifford's (1980)**

**Early Childhood Environment Rating Scale**

**SAMPLE  
SCORING STRIP**

Excellent  
7

6

Good  
5

4

Minimal  
3

2

Inadequate  
1

Item

**Personal Care Routines**

**1. Greeting/departing**

No plans made. Greeting children is often neglected; departure not prepared for.

Informally understood that someone will greet and acknowledge departure.

Plans made to insure warm greeting and organized departure. Staff member(s) assigned responsibility for greeting and departure of children. (Ex. Conversation on arrival; art work and clothes ready for departure).

Everything in 5 (Good) plus parents greeted as well as children. Staff use greeting and departure as information sharing time to relate warmly to parents.

**1. Greeting/departing**

1 2 3 4 5 6 7

**2. Meals/snacks**

Meals/snacks served on a haphazard, irregular schedule and of questionable nutritional value.

Well-balanced meals/snacks provided on a regular schedule but strict atmosphere, stress on conformity, meals not used as a pleasant social time or to build self-help skills (Ex. pouring milk, setting table, etc.).

Well-balanced meals/snacks provided on regular schedule. Staff member(s) sits with children and provides pleasant social environment during meals and when possible at snacks. Small group size permits conversation.

Everything in 5 plus time planned as a learning experience, including self-help skills; talking about children's interests, events of the day, and aspects of foods (color and where foods come from).

**2. or 2. Meals/snacks**

1 2 3 4 5 6 7

OR

**2. Meals/snacks  
(Infants)**

Feeding is not timed to child's needs and is of questionable cleanliness and nutritional value (Ex. bottles not sterilized, nipple uncovered, too rigid a schedule, etc.).

Clean, nutritionally adequate feeding on schedule suited to child's needs, but lack of social interaction (Ex. bottle is propped up, child is not held or talked to, no talking when child is spoon fed, etc.).

Clean, nutritionally adequate feeding on a suitable schedule, plus child is held and talked to while bottle fed. Solid food is spoon fed with pleasant adult-child interaction and conversation. Individual attention given.

Everything in 5 plus self-help is promoted in feeding (Ex. infant/toddler encouraged to finger feed self, then use spoon as ready).

7

6

5

4

3

2

1

**SAMPLE  
SCORING STRIP**

Item	Inadequate 1	2	Minimal 3	4	Good 5	Excellent 6	7
3. Nap/rest	Nap/rest time or place is inappropriate for children (Ex. too early or late, rest too long or too short, irregular schedule, crowded area, noisy, poor ventilation). Little or no supervision provided.		Nap/rest is scheduled appropriately with some supervision provided. However, problems exist with supervision, atmosphere, or area used.		Nap/rest is scheduled appropriately with supervision provided. Space is adequate and conducive to resting (Ex. good ventilation, quiet, cots placed for privacy).		Everything in 5 plus children helped to relax (Ex. cuddly toy, soft music, back rubbed). Provisions made for early risers and non-nappers.
4. Diapering/toileting	Lack of provisions interferes with care of children (Ex. located improperly, no hot water in area, inaccessible toilets). Sanitary conditions of area are not maintained by staff (Ex. facilities not clean, adults do not wash hands between children).		Make-shift provisions: difficult to keep clean or inaccessible, and not child sized, but sanitary conditions are maintained (Ex. water must be carried to diapering area).		Provisions convenient, well organized, easy to keep clean even if child sized toilets and sinks not available. Pleasant adult-child interactions.		Everything in 5 plus child sized toilets (potty chairs for toddlers acceptable) and low sinks to promote self-help. For infants: diapering used as time to talk to and relate warmly to child.
5. Personal grooming	Little attention paid to personal grooming (Ex. hand washing, hair combing, toothbrushing).		Inconsistent attention paid to grooming needs: hand washing, toothbrushing, etc., not a regularly scheduled part of the day.		Scheduled times for grooming: teeth brushed after meals, hands washed at meal times and after toileting. Grooming routines used to develop positive self concept. Extra clothes to change children.		Each child has toothbrush, etc.; grooming is part of educational program to promote good health care habits. Independence encouraged with proper supervision.

OR

◆ 5. Omit for rooms used exclusively for infants under nine months of age.

Total Personal Care  
(Items 1-5)





Item	Inadequate 1	2	Minimal 3	4	Good 5	Excellent 6 7	SAMPLE SCORING STRIP
8. For relaxation and comfort	No upholstered furniture, cushions, rugs, or rocking chair available for children to use. Lack of awareness of child's need for "softness" in environment.		No planned cozy area for children, although rug may be provided in child's play space or some upholstered furniture available to child.		Planned cozy area regularly available to children (Ex. rug, cushions, child sized rocker, adult rocker, or upholstered furniture). Cozy area may be used for reading, dramatic play, etc..	Planned cozy area plus "softness" available in several other areas (Ex. cushions in reading corner and doll house, several rug areas, many soft toys).	8. Furnishings (relaxation) 1 2 3 4 5 6 7
9. Room arrangement	No interest centers defined. Room inconveniently arranged (Ex. traffic patterns interfere with activities). Materials with similar use not placed together.		One or two interest centers defined, but centers not well placed in room (Ex. quiet and noisy activities near one another, water not accessible where needed). Supervision of centers difficult, or materials disorganized.		Three or more interest centers defined and conveniently equipped (Ex. water provided, shelving adequate). Quiet and noisy centers separated. Appropriate play space provided in each center (Ex. rug or table area out of flow of traffic). Easy visual supervision of centers.	Everything in 5 plus centers selected to provide a variety of learning experiences. Arrangement of centers designed to promote independent use by children (Ex. labeled open shelves, convenient drying space for art work). Additional materials organized and available to add to or change centers.	9. Room arrangement 1 2 3 4 5 6 7
◆ 8. Omit for rooms used exclusively for infants under nine months of age.							
OR							
10. Child related display	No materials displayed or inappropriate materials for age group predominate (Ex. materials designed for school-aged children or church materials).		Commercial materials or teacher made display predominate (Ex. nursery rhymes, ABC's, numbers or seasonal displays not closely related to children's current activities).		Children's work predominates. Some uniform work may be displayed (Ex. same project done by all). Teacher made display relates closely to current activities (Ex. charts, pictures, or photos about recent activities, projects, and trips). Many items displayed on child's eye level.	Individualized children's work predominates: variety of materials and topics. Three dimensional objects (playdough, clay, carpentry) displayed as well as flat work. Display changed often.	10. or ◆ 10. Child related display 1 2 3 4 5 6 7
◆ 10. Child related display (Infants/toddlers) see next page							

10. or ◆ 10. Child related display

1 2 3 4 5 6 7

9. Room arrangement

1 2 3 4 5 6 7

SAMPLE SCORING STRIP

8. Furnishings (relaxation)

1 2 3 4 5 6 7

**SAMPLE  
SCORING STRIP**

Item	Inadequate 1	2	Minimal 3	4	Good 5	Excellent 7
◆10. Child related display (Infants/toddlers)	No materials displayed.		Inappropriate materials for age group displayed (Ex. materials designed for school-aged children or church materials).		Colorful, simple photographs and pictures displayed on child's eye level (Ex. in feeding area, near cribs and crawling areas or where chil- dren can be held up to see them). Mobiles and other colorful objects for children to look at.	Everything in 5 plus staff point out pictures and talk to infants about them. Ample use of photographs of children in group. Early scribble pictures done by Infants/toddlers are displayed.

Total  
Furnishings/display  
(Items 8-10)

**Language-Reasoning  
Experiences**

	1	2	3	4	5	6	7
11. Understanding of language (receptive language)	Few materials present and little use of materials to help children understand language (Ex. no scheduled story time daily).		Some materials present, but either not available on regular basis (closed cabinets) or not regularly used for language development.		Many materials present for free choice and supervised use. At least one planned activity daily (Ex. reading books to children, story telling, flannel board stories, finger plays, etc.).		Everything in 5 plus teacher provides good language model throughout day (Ex. gives clear directions, uses words exactly in descriptions). Plans addi- tional activities for children with special needs.

11. Understanding  
language

1 2 3 4 5 6 7

	1	2	3	4	5	6	7
12. Using language (expressive language)	No scheduled activities for using language (Ex. no chil- dren's planning time, talking about drawings, dictating stories, show 'n tell, etc.).		Some scheduled activities for using language (Ex. show 'n tell), but child language not encouraged throughout the day.		Many scheduled activities for using language available during free play and group times, but not planned specifically for expressive language develop- ment.		Daily plans provide a wide variety of activities for using language during free play and group times. Opportunities to develop skills in expressing thoughts are part of a language development plan based on individual needs. Teachers encourage expressive language throughout the day.

12. Using language

1 2 3 4 5 6 7

**SAMPLE  
SCORING STRIP**

Item	Inadequate 1	2	Minimal 3	4	Good 5	Excellent 7	13. Reasoning 1 2 3 4 5 6 7
13. Using learning concepts (reasoning)	No games, materials, or activities to extend and encourage reasoning (Ex. no matching, sequencing, categorizing, etc.).		Some games, materials, or activities present, but not used with teacher guidance or not readily available.		Sufficient games, materials, and activities available on a regular basis. Children use by choice with teacher available to assist in developing concepts by talking to a child and asking questions to stimulate child's reasoning.	Everything in 5 plus, a plan for introducing concepts as children are ready, either individually or in groups. Teacher encourages children to reason throughout the day, using actual events and experiences as a basis for concept development (Ex. children learn sequence by talking about their experiences in the daily routine, or recalling the sequence of a cooking project).	
Materials							
Infants: shape sorting boxes, beads.							
Preschool: sequence cards, same-different games, size and shape toys, sorting games.							

13. Reasoning  
1 2 3 4 5 6 7

14. or 14. Informal language  
1 2 3 4 5 6 7

14. Informal use of language	Language outside of group times primarily used by staff to control children's behavior and manage routines.	Staff sometimes talks with children in conversation, but children are asked primarily "yes/no" or short answer questions. Children's talk not encouraged.	Staff-child conversations are frequent. Language is primarily used by staff to exchange information with children and for social interaction. Children are asked "why, how, what if" questions, requiring longer and more complex answers.	Staff makes conscious effort to have an informal conversation with each child every day. Staff verbally expands on ideas presented by children (Ex. adds information, asks questions to encourage child to talk more).
------------------------------	---	---	--	--

OR

14. Informal use of language (Infants/toddlers)	Little or no talking to infants and toddlers.	Language used primarily to control child's behavior (Ex. No, no!).	Caregiver responds to sounds infants make, engages in verbal play (Ex. sings to child, imitates child's sounds). Staff repeats what toddlers say, expanding and elaborating when appropriate.	Everything in 5 plus staff talks to child during routines describing activity child is engaged in. Encourages toddlers to use words. Maintains eye contact while talking to child.
---	---	--	---	--

Total  
Language/reasoning  
(Items 11-14)

**SAMPLE  
SCORING STRIP**

**Excellent**  
7

**Good**  
5

**Minimal**  
3

**Inadequate**  
1

**Item**

**Fine and Gross Motor  
Activities**

**15. Perceptual/fine  
motor**

**Materials**  
Infants: mobiles, tactile  
materials, grasping toys.  
Preschool: beads, puzzles,  
Leggo and small building  
toys, scissors, crayons.

Variety of developmentally  
appropriate perceptual/fine  
motor materials in good  
repair used daily by children.

Some developmentally appro-  
priate perceptual/fine motor  
materials available for daily  
use.

No developmentally appro-  
priate fine motor/perceptual  
materials available for daily  
use.

Everything in 5 plus materials  
rotated to maintain interest;  
materials organized to en-  
courage self-help; activities  
planned to enhance fine  
motor skills.

**16. Fine motor**

1 2 3 4 5 6 7

**16. Supervision  
(fine motor activities)**

No supervision provided  
when children play with  
perceptual/fine motor  
materials.

Supervision only to protect  
health and safety or stop  
arguments.

Child given help and en-  
couragement when needed  
(Ex. to finish puzzle, to fit  
pegs into holes; shown how  
to use scissors, etc.). Teacher  
shows appreciation of  
children's work.

Everything in 5 plus teacher  
guides children to materials  
on appropriate level for  
success. Teacher plans  
learning sequences to develop  
fine motor skills (Ex. pro-  
vides children with puzzles  
of increasing difficulty,  
stringing of large beads  
before small beads).

**16. Supervision (FM)**

1 2 3 4 5 6 7

**17. Space for gross  
motor**

No outdoor or indoor space  
specifically set aside for  
gross motor/physical play.

Some space specifically set  
aside outdoors or indoors  
for gross motor/physical  
play.

Adequate space outdoors and  
some space indoors with plan-  
ned safety precautions (Ex.  
cushioning ground cover  
under climbing equipment,  
fenced in area, proper  
drainage).

Planned, adequate, safe,  
varied, and pleasant space  
both outdoors and indoors  
(Ex. appropriate ground  
covers: sand, black top, wood  
chips; shade in summer, sun  
in winter, wind break, etc.).  
Indoor space used in bad  
weather.

**17. GM space**

1 2 3 4 5 6 7

**SAMPLE  
SCORING STRIP**

Item	Inadequate 1	2	Minimal 3	4	Good 5	Excellent 6 7
18. Gross motor equipment	Little gross motor equipment, in poor repair, or not age appropriate.		Some appropriate gross motor equipment, but seldom in use (Ex. inaccessible, requires daily moving or set up) or little variety in equipment.	Gross motor equipment is readily available and sturdy; stimulates variety of skills (Ex. crawling, walking, balancing, climbing). Building and dramatic play equipment included in gross motor areas.	Everything in 5 plus equipment is imaginative, flexible, frequently re-arranged by staff and children to maintain interest. Several different pieces of equipment on different levels of skill (Ex. swing set, tire swing, and knotted rope).	

18. GM equipment  
1 2 3 4 5 6 7

Item	1	2	3	4	5	6 7
19. Scheduled time for gross motor activities	No scheduled physical activity time outdoors or indoors.	Occasional scheduled physical activity time.	Regularly scheduled physical activity time daily, both morning and afternoon.	Regularly scheduled daily physical activity times with some age appropriate planned physical activity (Ex. play with balls, bean bag games, follow the leader, obstacle course) as well as informal play time.		

19. GM time  
1 2 3 4 5 6 7

Item	1	2	3	4	5	6 7
20. Supervision (gross motor activities)	No supervision provided near gross motor area.	Supervision provided near gross motor area.	Supervision provided but attention to children is minimal (Ex. adult seated at distance from children, attention divided with other tasks, several adults chatting, etc.).	Supervision provided near children. Attention mainly to safety of children.	Supervisor talks to children about ideas related to their play, helps with resources to enhance play, and builds social skills. When appropriate, concepts such as near-far, fast-slow, up-down are related to children's activities.	

20. Supervision (GM)  
1 2 3 4 5 6 7

**Total**  
**Fine/gross Motor**  
**(Items 18-20)**

Item	SAMPLE SCORING STRIP						
	Inadequate 1	2	Minimal 3	4	Good 5	6	Excellent 7
<b>Creative Activities*</b>							
21. Art	Few art materials available; regimented use of materials (Ex. mostly teacher directed projects). Art materials not readily available for children to use as a free choice activity.		Some materials, primarily drawing and painting, available for free choice, but major emphasis on projects that are like an example shown.		Individual expression and free choice encouraged with art materials. Very few projects that are like an example shown.		Variety of materials available for free choice, including three dimensional materials (Ex. clay, art dough). Attempt to relate art activities to other experiences.
							21. Art 1 2 3 4 5 6 7
22. Music/movement	No specific provisions made for music/movement activities (Ex. no children's records or musical instruments).		Some provisions for musical experiences (Ex. phonograph or musical instruments or singing time), but musical experiences seldom available.		Planned music time for singing, musical instruments or movement provided several times weekly.		Space and time planned for music and movement; variety of phonograph records, dance props. Music provided daily as either free choice or group activity.
							22. Music/movement 1 2 3 4 5 6 7
23. Blocks	Few blocks and accessories. Not enough space to play with blocks.		No special block area set aside, but space available for block play. Blocks and accessories enough for at least two children to play at one time.		Special block area set aside out of traffic with convenient storage. Space, blocks, and accessories for three or more children at one time. Area available for at least one hour each day including some mornings and some afternoons each week.		Special block area with suitable surface (Ex. flat rug). Variety of large and small blocks and accessories, with storage organized to encourage independent use (Ex. with pictures on shelves to show where blocks belong).
							23. Blocks 1 2 3 4 5 6 7

\*Omit items 21-27 for rooms used exclusively for infants under nine months of age.

**SAMPLE  
SCORING STRIP**

Item	Inadequate 1	2	Minimal 3	4	Good 5	6	Excellent 7
24. Sand/water	No provision for sand or water play.	Some provision for sand or water play outdoors or indoors.	Provision for sand and water play outdoors or indoors including toys (Ex. cups, spoons, funnels, shovels, pots and pans, trucks, etc.). Used at least weekly.	Provisions for sand and water play outdoors and indoors with appropriate toys.			
25. Dramatic play	No special provisions made for dress-up or dramatic play.	Dramatic play props focused on housekeeping roles. Little or no provisions for dramatic play involving transportation, work, or adventure.	Variety of dramatic play props including transportation, work, adventure, fantasy. Space provided in the room and outside the room permitting more active play (either outdoors or in a multipurpose room or gym).	Everything in 5 plus pictures, stories, trips, used to enrich dramatic play.			
26. Schedule	Routine care (eating, sleeping, toileting, etc.) takes up most of the day. Little planning for interesting activities either indoors or outdoors.	Schedule is <i>either</i> too rigid leaving no time for individual interests or too flexible (chaotic) with activities disrupting routines.	Schedule provides balance of structure and flexibility. Several activity periods, some indoors and some outdoors, are planned each day in addition to routine care.	Balance of structure and flexibility, with smooth transitions between activities (Ex. materials ready for next activity before current activity ends). Plans included to meet individual needs (Ex. alternative activity for children whose needs differ from group).			



Item	Inadequate 1	2	Minimal 3	4	Good 5	Excellent 6	7
27. Supervision (creative activities)	No supervision provided, except if problems occur.		Supervision provided but attention to children is minimal (Ex. attention divided with other tasks, several adults chatting, etc.).		Supervision provided near children. Attention mainly to safety, cleanliness, proper use of materials.		Teacher interacts with children, discusses ideas and helps with resources to enhance play. Recognition of the sensitive balance between child's need to explore independently and adult's opportunity to extend learning.
							27. Supervision (creative) 1 2 3 4 5 6 7
							Total Creative Activities (Items 21-27) _____
Social Development							
28. Space to be alone	No possibility for children to play alone, protected from intrusion by others. Staff consider child being alone undesirable.		Although space is not especially set aside, children are allowed to find space to be alone (Ex. in play equipment, behind furniture).		Space set aside for one or two children to play, protected from intrusion by others (Ex. no interruption rule, space out of sight, gate).		Everything in 5 plus play alone activities provided as part of curriculum for development of concentration, independence, and relaxation.
							28. Space (alone) 1 2 3 4 5 6 7
29. Free Play (free choice)	Either little opportunity for free play or much of day spent in unsupervised free play. Inadequate toys, games, and equipment provided for children to use in free play.		Some opportunity for free play, with casual supervision provided as a safety precaution. Free play not seen as an educational opportunity (Ex. teacher misses chance to help child think through solutions to conflicts with others, encourage child to talk about activity, introduce concept in relation to child's play).		Ample and varied toys, games, and equipment provided for free play. Adult supervision provided on a regular basis. Free play scheduled several times during the day.		Ample opportunity for supervised free play outdoors and indoors with wide range of toys, games, and equipment. Supervision used as an educational interaction. New materials/experiences for free play added periodically.
Child is permitted to select materials, companions, and as far possible manage play independently. Adult interaction is in response to child's needs.							29. Free play 1 2 3 4 5 6 7

**SAMPLE  
SCORING STRIP**

Excellent  
7

Good  
5

Minimal  
3

Inadequate  
1

Item

30. Group time (other than sleeping, eating)  
OR  
◆ 30. Omit for rooms used exclusively for infants under nine months of age.
30. Group time
- 1 2 3 4 5 6 7
- Everything in 5 plus different groupings planned to provide a change of pace throughout the day. One-to-one adult-child activities included. Free play and small groups pre-dominate.
- Planning done for small group as well as large group activities. Whole group gatherings limited to short periods suited to age and abilities of children.
- Some free play available between group activities; however, all planned activities done as whole group (Ex. all do same art project, read story, listen to record at the same time).
- Children kept together as whole group most of the day. Few opportunities for adult to interact with one to three children while other children involved in various free choice activities.

31. Cultural awareness
- 1 2 3 4 5 6 7

31. Cultural awareness
- 1 2 3 4 5 6 7
- Everything in 5 plus cultural awareness is part of curriculum through planned use of both multi-racial and non-sexist materials. (Ex. including holidays from other religions and cultures, cooking of ethnic foods, introducing a variety of roles for women and men through stories and dramatic play).
- Cultural awareness evidenced by liberal inclusion of multi-racial and non-sexist materials (Ex. dolls, illustrations in story books, and pictorial bulletin board materials).
- Some evidence of ethnic and racial variety in toys and pictorial materials (Ex. multi-racial or multi-cultural dolls, books or bulletin board pictures of varied countries and races).
- No attempt to include ethnic and racial variety in dolls, book illustrations, or pictorial bulletin board materials. All toys and visible pictures are of one race only.

32. Tone
- 1 2 3 4 5 6 7

32. Tone
- 1 2 3 4 5 6 7
- General impression of the quality of interaction.
- Staff and children seem strained, voices sound irritable and angry, children cry frequently. Physical contact used principally for control (Ex. hurrying children along).
- Adults inattentive and unresponsive when children are calm and happy but become involved only when problems occur (Ex. infrequent smiling, loud voices).
- Calm but busy atmosphere. Children seem happy most of the time. Staff and children seem relaxed, voices cheerful, frequent smiling. Adults show warmth in physical contact (Ex. gentle holding, hugging). Mutual respect exists among adults and children.
- Everything in 5 plus adults prevent problems by careful observation and skillful intervention (Ex. helping children before minor problems become serious, discussing with children ways of settling conflicts). Curriculum includes planning for development of social skills (Ex. through story books and discussion groups).

SAMPLE SCORING STRIP							
Item	Inadequate 1	2	Minimal 3	4	Good 5	Excellent 6 7	
33. Provisions for exceptional children	No provisions or plans for modifying the physical environment, program, and schedule for exceptional children. Reluctance to admit children with special needs.		Minor accommodations made to get through the day, but no long range plans for meeting the special needs of exceptional children. No attempt to assess degree of need.		Staff assesses needs of children and makes modifications in environment, program, and schedule to meet the special needs of exceptional children.	Everything in 5 plus: individually planned program for exceptional children involving parents and using professionally trained person as consultant to guide assessment and planning. Referral to support services.	33. Exceptional provisions 1 2 3 4 5 6 7
Modifications: Physical environment (Ex. ramps, restrooms, playground). Program (Ex. specialized materials, equipment, use of supportive services, individually planned program). Schedule (Ex. shorter day, alternate activities).							
Adult Needs	1	2	3	4	5	6 7	Total Social Development (Items 28-33)  _____
34. Adult personal area	No special adult areas (Ex. no separate restroom, lounge, storage for personal belongings).	Either separate adult restroom or lounge provided. Little, if any, adult furniture. Storage for personal belongings is minimal.		Adult restroom and lounge area available: lounge may be used for children's activities. Adult furniture in lounge. Central storage for teachers' belongings.		Adult restroom and lounge separate from children's activity areas. Comfortable adult furniture. Individual storage for personal belongings in classroom, with safety provisions if necessary.	34. Adult personal area 1 2 3 4 5 6 7

Item	SAMPLE SCORING STRIP					Excellent	35. Adult opportunities	1	2	3	4	5	6	7	36. Adult meeting area	1	2	3	4	5	6	7	37. Parent provisions	1	2	3	4	5	6	7	
35. Opportunities for professional growth	No professional library in facility. Infrequent staff meetings. No inservice training provided.	Limited professional library (Ex. few books, magazines, or curriculum materials to improve teacher performance). Staff meetings limited to administrative concerns. No inservice training plan for staff.	Good professional library, current materials on wide variety of subjects readily available. Regular staff meetings, which include staff development activities. Plans for orienting new staff members.	Everything in 5 plus planned sharing of professional materials among staff. Inservice training includes workshops and courses available in community as well as training in staff meetings. Support available for inservice training (Ex. released time, travel costs, scholarships).																											
36. Adult meeting area	No suitable area for adult group meetings or individual conferences during the day.	Some adult meeting area available, but must be used for other activities which interfere (Ex. area noisy, interruptions frequent because of dual use as office, play room, kitchen, etc.).	Adult group meeting area and conference space is satisfactory. Dual use (if necessary) does not make scheduling difficult.	Everything in 5 plus individual conference area separate from children's activity areas and other dual use.																											
37. Provisions for parents	No provisions made for parent/staff or parent/parent information exchange, or parent involvement in program. Parents discouraged from observing or being involved in program.	Parents given minimal information and limited possibilities for involvement (Ex. information only concerning rules, fees, attendance schedule; minimal contact at arrival and departure of children). Little attempt to make parents welcome.	Parent/staff information exchanged at regular intervals (Ex. through parent conferences, newsletter, etc.). Parents made aware of approach practiced at facility (Ex. through information sheets, parent meetings, etc.). Parents welcomed to be a part of program (Ex. eat lunch with child, share a family custom with child's class).	Everything in 5 plus provision of information on parenting, health care, etc.. Parents' input regularly sought in planning and evaluation of program. Parents involved in decision making roles along with staff (Ex. parent representatives on board).																											
Information sheets: rules, approach to education, and care. Newsletter Bulletin board Parent conferences Scheduled parent group meetings Parent meeting and conference space																															

Total Adults  
(Items 34-37)

**Appendix B**

**Nock and Rossi's (1980) Home Prestige Formula**

## Nock and Rossi's (1980) Home Prestige Formula

SES Computation

MARST (marital status): (0) one-parent

(1) two-parent

FSEIGEL: Father's Seigel occupation prestige rating

MSEIGEL: Mother's Seigel occupation prestige rating

FED: Education of father (years completed)

MED: Education of mother (years completed)

FAGE: Father's age in years

MAGE: Mother's age in years

MINORS: Number of minors in the home

IF (MARST EQ 0)

$$\text{SES} = .452 * \text{MSEIGEL} + 1.429 * \text{MED} - .018 * \text{MAGE} + .412 - .997$$
$$* \text{MINORS} + 31.7.$$

IF (MARST EQ 1)

$$\text{SES} = .434 * \text{FSEIGEL} + .704 * \text{FED} + .025 * \text{FAGE} - .079 *$$
$$\text{MINORS} + .391 * \text{MSEIGEL} + \text{MED} - (.002 * \text{FSEIGEL} * \text{MSEIGEL}) +$$
$$10.5.$$

**Appendix C**

**Research Description - Day Care Directors**

## Research Description - Day Care Directors

### Information Sheet

Description of project: DEVELOPPEMENT SOCIAL ET LE PASSAGE DE LA GARDERIE A LA MATERNELLE: LES EFFETS DES DIFFERENCES DANS LES MILIEUX DE GARDE.

The Government of Quebec has recently funded this research project in the Department of Education and the Department of Psychology at Concordia University and in the Departments of Education at the University of Montreal and at Laval University. This study will look at the environmental factors affecting a child's social behaviour and language development.

You are, of course, very familiar with the debate that arose when more and more working mothers chose day care settings for their children as opposed to home care - was day care harmful? In general, it is now agreed by most researchers that day care settings are "not harmful", and can, in fact, be beneficial. What is not well-understood, however, is precisely which environmental factors foster positive social interactions and language development in children. A number of factors have been thought to be important - for example, teacher/child ratio, manner of language stimulation, spatial arrangement of the setting, and so on. There has, however, been little objective research into such problems. We would like to begin to study the effects of such factors in our project.

We would like to directly observe children in a number of



day care settings, recording their play behaviours as they occur. To do this observation, we ask you to allow a trained observer watch the children during free play several times a week for a period of three or four weeks. The observer would not interfere with the children's play in any way.

We would also like to interview the four-year old children with some previous day care experience in order to measure their language development and their ideas about social skills. We would ask each of these children to do a short picture vocabulary test - The Peabody Picture Vocabulary Test, in which the child is asked to identify which of several picture is "a house" or "ironing". We would also give the Harter and Pike Pictorial Scale of Perceived Competence and Acceptance for Young Children. This task involves showing the child a series of pictures of children performing various social tasks and asking which pictures are most like himself or herself. Both these tests are very simple, have been used extensively with children, and most children enjoy taking them.

All information on individual children collected in the study will be strictly confidential. Results are always reported on group data.

We think that what we learn in this study will be valuable to parents in helping them decide what factors to look for in selecting day care centres and in helping educators refine and improve day care environments. If you

have any questions at all about the study, please do not hesitate to call either Mrs. Joan Spindler, our project coordinate at 848-2256 or Dr. Donna White, the project director, at 848-7542.

Appendix D  
Research Description and Consent Forms  
for Parents

Appendix D  
Research Description and Consent Forms  
for Parents

Information sheet

Description of project: DEVELOPPEMENT SOCIAL ET LE PASSAGE DE LA GARDERIE A LA MATERNELLE: LES EFFETS DES DIFFERENCES DANS LES MILIEUX DE GARDE.

The Government of Quebec has recently funded this research project in the Department of Education and the Department of Psychology at Concordia University and in the Departments of Education at the University of Montreal and at Laval University. This study will look at the environmental factors affecting a child's social behaviour and language development.

You are, of course, very familiar with the debate that arose when more and more working mothers chose day care settings for their children as opposed to home care - was day care harmful? In general, it is now agreed by most researchers that day care settings are "not harmful", and can, in fact, be beneficial. What is not well understood, however, is precisely which environmental factors foster positive social interactions and language development in children. A number of factors have been thought to be important - for example, teacher/child ratio, manner of language stimulation, spatial arrangements of the setting, and so on. There has, however, been little objective research into such problems. We would like to begin to study the effects of such factors in

our project.

We would like to directly observe children in a number of day care settings, recording their play behaviours as they occur. To do this observation, we would ask you to allow a trained observer to watch your child during free play several times a week for a period of three or four weeks. The observer would code behaviors on a checklist. The observer would not interfere with the children's play in any way.

We would also ask your child to do a short picture vocabulary test - The Peabody Picture Vocabulary Test, in which he/she is asked to identify which of several pictures is "a house" or is "ironing". We would also give the Harter and Pike Pictorial Scale of Perceived Competence and Acceptance for Young Children. This task involves showing your child a series of pictures of children performing various social tasks and asking which picture is not like himself or herself. Both these tests are very simple, have been used extensively with children, and most children enjoy taking them.

All information on individual children collected in the study will be strictly confidential. Results are always reported on group data.

We think that what we learn in this study will be valuable to parents in helping them decide what factors to look for in selecting day care centres and in helping educators refine and improve day care environments. If you have any questions at all about the study, please do not

hesitate to call either Mrs. Joan Spindler, our project coordinator, of Ms Evelyn Schliecker at 848-2256 or Dr. Donna White, the project director, at 848-7542.

## Consent Form

I have read the accompanying information sheet describing this project and understand its goals and methods. I agree that my child

.....(child's name) may participate in the study.

Signature: .....

Name (Please print) .....

Relationship to child .....

If you would like a copy of any published results of this study please indicate by signing your name and providing your address and phone number.

Signature .....

Address .....

.....

.....

Phone No .....

**Appendix E**  
**SES Interview Questionnaire**



Appendix E  
SES Interview Questionnaire

Subject #

Surname: \_\_\_\_\_ First Name: \_\_\_\_\_

Marital Status: Married\_\_ Divorced\_\_ Separated\_\_ Widowed\_\_

Other\_\_

Who lives in the home: Father of child? YES\_\_ NO\_\_

Age\_\_\_\_\_

Education: Elementary 1 2 3 4 5 6 7

Secondary 8 9 10 11 12

C.E.G.E.P.

University

Job Description:

Prestige Score

Mother of child? YES\_\_ NO\_\_

Age\_\_\_\_\_

Education: Elementary 1 2 3 4 5 6 7

Secondary 8 9 10 11 12

C.E.G.P.

University

Job Description:

Prestige Score

Minor Children: Name \_\_\_\_\_ Age \_\_\_\_\_

Name \_\_\_\_\_ Age \_\_\_\_\_

Name \_\_\_\_\_ Age \_\_\_\_\_

## **Appendix F**

**Two-step Staged Hierarchical Regression Analyses  
Including Sex of Child as a Predictor of PPVT-R Scores**

## Two-step Staged Hierarchical Regression Analyses

Including Sex of Child as a Predictor of PPVT-R Scores

Summary of staged hierarchical regression analyses predicting  
PPVT-R scores, including sex of child as a predictor

	<u>Beta</u>	<u>sr<sup>2</sup></u>	<u>R<sup>2</sup></u>	<u>R<sup>2</sup> Change<sup>1</sup></u>
<u>Equation 1F; Whole Sample, n = 100</u>				
Marital status	.06	.00		
Mother's age	.12	.01		
Mother's education	.21	.02		
Mother's occupation	.15	.02		
Sex of child	-.09**	.01		
Center quality	.31**	.07	.35***	.07**
<u>Equation 2F; Whole Sample, n = 100</u>				
SES	.41***	.14		
Sex of child	-.07**	.00		
Center quality	.29**	.07	.36***	.07**
<u>Equation 3F; Two-parent families, n = 63</u>				
Mother's age	-.18*	.03		
Mother's education	.30	.06		
Mother's occupation	.20	.03		
Sex of child	-.09*	.01		
Center quality	.26	.05	.31***	.05*
<u>Equation 4F; Two-parent families, n = 63</u>				
Mother's age	-.13	.01		
Mother's education	.17	.02		
Mother's occupation	.16	.02		
Father's age	-.15*	.02		
Father's occupation	.30	.06		
Sex of child	-.06	.00		
Center quality	.12	.04	.37***	.04

<sup>1</sup> Change from step one, after addition of center to quality to the equation.

	<u>Beta</u>	<u>sr</u> <sup>2</sup>	<u>R</u> <sup>2</sup>	<u>R</u> <sup>2</sup> Change <sup>2</sup>
<u>Equation 5F; One-parent families, n = 37</u>				
Mother's age	.53***	.27		
Mother's education	.15	.02		
Mother's occupation	.15	.02		
Sex of child	.01	.00		
Center quality	.57***	.19	.57***	.19***

<sup>2</sup> Change from step one, after addition of center to quality to the equation.

**Appendix G**  
**Discussion Regarding Interaction Terms**  
**in Multiple Regression Analyses**

### Discussion Regarding Interaction Terms in Multiple Regression Analyses

In multiple regression analyses it is assumed that the relationship between the criterion variable and any one predictor variable is the same across all values of the other predictor variables. This assumption is predicated on the further assumption of additivity of effects (Kim & Kohout, 1975). Failure to meet the assumptions of linearity and additivity may result in inaccurate prediction of the criterion variable (Kim & Kohout, 1975; Tabachnick & Fidell, 1983).

One method that has been proposed for testing this assumption involves creating multiplicative terms between the variables in order to test the joint effect of the variables (Kim & Kohout, 1975). The multiplicative terms are then forced into the hierarchical multiple regression analysis in the final step of the equation in order to assess their significance to the criterion variable, after the variance explained by the individual predictors has been removed.

Although the multiplicative procedure is recommended if theoretical or empirical evidence suggests the possibility of interactions between the variables, the procedure is not without problems. In analyses involving several independent variables, the number of possible multiplicative combinations is prohibitive. In order to maintain an optimum subjects to variables ratio, one would require many more subjects than are

usually available in order to effectively include all of the interactions.

A second problem with the inclusion of multiplicative terms involves the potential problems of multicollinearity and singularity. The product of two terms often results in extremely highly correlations between the multiplicative term and one or both of the multipliers. Matrix inversion is required to calculate regression coefficients, an impossible procedure with perfectly correlated variables, and highly unstable with highly correlated variables (Tabachnick & Fidell, 1983).

Rigorous examination of the residuals scatterplots and probability plots for each analysis reported here failed to detect any evidence of departure from normality, linearity or homoscedasticity of residuals. Because of the potential problems associated with the inclusion of multiplicative terms in regression analysis, and the evidence suggesting that all required assumptions have been met in these analyses it was decided not to include interaction terms in any of the analyses.