This chapter focuses on the innermost level of Bronfenbrenner's four-level conception of the human environmental ecology, namely the microsystem, and more specifically, the child's socialization in the family. Following discussion of concepts related to socialization, competence, and environmental ecology, selected research studies are reviewed to illuminate various factors within the family setting that may influence Chicano children's academic development. Such factors include the mother-child relationship, maternal teaching behaviors, mother's educational attainment, family size and sibling structure, socioeconomic status, home language, single parenting, home environmental processes (parent behaviors), and parent beliefs and aspiration. Also reviewed are intervention experiments that involved training parents to adopt behaviors that facilitated their children's academic success, and studies of the effects of parents' beliefs on boys' and girls' mathematics achievement. In addition to the family, the microsystem contains other settings that can be important socializers and determinants of academic development, including the school itself, the peer group, and the media. More research is needed to examine how the socialization process interacts with other levels of the environmental ecology to create and maintain patterns of ethnic group differences in academic learning, scholastic motivation, and movement through the schooling process. Contains 139 references. (SV)
Chapter 7

COGNITIVE SOCIALIZATION AND COMPETENCE: THE ACADEMIC DEVELOPMENT OF CHICANOS

Luis M. Laosa and Ronald W. Henderson
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Cognitive Socialization and Competence: The Academic Development of Chicanos

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It is now well known that Chicanos, as a group, attain considerably lower levels of academic achievement than the national average (Orum, 1986; Valencia, Chapter 1, this volume). This is a serious and persistent problem facing educators at all levels of the US educational system. More than an educational problem, however, this state of affairs has become a pressing social issue of growing significance and urgent public concern, given that this ethnic group represents a rapidly expanding proportion of the US population (US Bureau of the Census, 1988). Nevertheless, there is little agreement about the causes of the problem. Our goal in this chapter is to provide a context that we hope contributes toward a constructive understanding of these causes. To this end, we relate the question of causes to theory and research bearing on socialization processes and the development of competence in children and youth.

Socialization

Although there is some variation in how scholars of different disciplines and theoretical orientations conceptualize it, current definitions of socialization can be summed up as the process whereby the individual acquires the values, beliefs, ways of thinking, behavior patterns, and other personal, yet social, attributes that will characterize the person in the next phase of his or her development. Most concisely put, the study of socialization focuses on the development of the person as a participant in society (for a review of the evolution of the concept see Clausen, 1968). Socialization may be viewed from the perspective of the individual or from that of a collectivity — be it the larger society or a constituent group. Some writers put the stress on the individual's learning or development; others emphasize the social apparatus that influences such learning and that defines for the individual the range of what is acceptable. In either case, socialization implies that the individual is induced in some measure to conform to the ways of the society or of a particular group. Socialization and social control therefore go hand in hand; they are complementary processes. Social control rests largely on the transmission of norms through socialization. Moreover, as Clausen further reminds us, the effectiveness of social control depends 'on the recruitment and socialization of (witting or unwitting) control agents' (1968, p. 6). As an underlying basis for social control, socialization leads the new member to adhere to the norms of the society or of the group and to become committed to its future (Clausen, 1968).

The process of socializing the growing child takes place through many avenues, including schools, television, and peers; but the family generally is, at least for young children, the primary arena for socialization. In recent years, there has been a growing awareness that socialization is not always a unidirectional process; there is evidence that children influence their parents or teachers as well as vice versa (for reviews of research see Brophy and Good, 1974; Dusek and Joseph, 1983; Henderson, 1980; Laosa, 1977a; Maccoby and Martin, 1983; Peterson and Rollins, 1987; Sigel, Dreyer and McGillicuddy-LeList, 1984). But, as Maccoby and Martin (1983) caution us, this idea should not lead us to lose sight of the enormous differential in power that exists between an adult and a child, and the potential for asymmetry thus involved.

Although the point is seldom clearly made, socialization is by no means always a purposive endeavor. It comprises, of course, situations in which a socialization agent consciously seeks to modify or mold the individual toward more or less clearly envisioned outcomes. But the concept also includes the kinds of incidental learning, or experiencing, that occur, often unwittingly, when one lives among others. Some dimensions of the socialization process are indeed quite subtle, and only with difficulty can they be brought into awareness. This characteristic does not make them insignificant or inconsequential. On the contrary, it is just because they are frequently subtle and outside of our immediate awareness that the study of socialization process and outcomes becomes a particularly challenging endeavor.

Social and behavioral scientists are not alone in their sensitivity to the implications of the individual’s experience for his or her development and public behavior as a member of the society. Parents, educators, and other socialization agents generally have in mind some conception of what the child is 'supposed to become' and of the role that any child-rearing or educational practice may play in achieving or hindering the desired outcome (Inkeles, 1968b; Laosa, 1983). This sensitivity is also evident in the growing public concern over the impact on the future of the society of persistent poor academic achievement by an ever expanding Chicano population. That is, there is an urgent concern with the ability of the present generation of young children in the United States — an increasing proportion of whom are Chicanos and similarly situated minorities — to maintain, upon becoming adults, the nation’s technological and economic competitiveness and to support adequately the aging mainstream population. This is a well-founded concern, and it is reflected perhaps nowhere better than in the recent spate of reports by national and regional commissions on the status of youth and education in the United States (Board of Inquiry, 1985; National Commission on Excellence in Education, 1983; Regional Policy Committee on Minorities in Higher Education, 1987; Youth and America’s Future, 1988).
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...development existing in a given culture or subculture at a particular point in its history. In this regard, it is important to note the existence of psychological and cultural factors that can contribute to the academic success or failure of Chicano students.

Competence

Whereas socialization refers to the process whereby attributes are acquired, the concept of competence stresses the individual's ability to perform tasks. Socialization and competence are thus intimately linked concepts (Inkeles, 1968; Laosa, 1979/1989, 1982). Generally, what is competence? A competent person is one who is well-versed in the world around him, able to perform tasks with skill and confidence.

In some respects, Vygotsky's views are similar to the longstanding tradition of psychological anthropology that argues that different environmental conditions can lead to the development of different patterns of ability (see, e.g., Laboratory of Comparative Human Cognition, 1983). These conceptions are compatible with the American Heritage Dictionary's definition of competence: "the ability to perform a task with skill or proficiency." (Inkeles, 1968, p. 30). On the other hand, the goal of socialization is to produce competent people. But, specifically, what is competence? A child's performance in a particular classroom setting, for example, may not always be a sign of his or her potential success. Socialization is to produce competent people. Accordingly, the personal and social rewards that one derives from competence, as well as the degree to which it is desired, can vary significantly. Thus, in this context, competence refers to the exercise of behaviors that lead to a feeling of efficacy and satisfaction. It represents a source of gratification that is rewarding one's behavioral initiatives are to be considered, as differing conceptions of the term have been advanced in both the psychological and sociological literatures.

In the sense that White (1959, 1979) has used the term, for example, competence has been equated with "pressor" and "adaptability". Pressor, as defined by Inkeles (1968, b), is the ability to exert force or influence. The emphasis is upon acquired information, skills, motives, and styles of thinking and of expressing affect. For Inkles, then, competence is the capacity to mediate one's behavioral initiatives are to be considered, as differing conceptions of the term have been advanced in both the psychological and sociological literatures. In this view, competence represents the ability to mediate one's behavior in the social context. It is a matter of acquiring capacities for role performance. From yet another perspective, competence is the symbolic-interactional and neo-Freudian concept of participation in society means participation in a complex social order; yet the environment as a set of four nested structures, each inside the other, of the forms of psychological functioning and possible sources of development in a given culture or subculture at a particular point in its history. In this regard, it is important to note the existence of psychological and cultural factors that can contribute to the academic success or failure of Chicano students.

The Environmental Ecology

Participation in society means participation in a complex social order; yet the dominant conceptions in the study of human development and education have tended to separate not only the family from the person but also the family from the person's social environment. Bronfenbrenner's (1979, 1989) general systems approach has found some favor in recent years in understanding this relation. Specifically, Vygotsky's approach to understanding the complex social environment in which the individual develops is an integral part of the social and cultural setting. In this view, Bronfenbrenner's work emphasizes the progressive accommodation and the changing environments in which it is developed. Bronfenbrenner's work emphasizes the progressive accommodation and the changing environments in which it is developed. Bronfenbrenner's work emphasizes the progressive accommodation and the changing environments in which it is developed. Bronfenbrenner's work emphasizes the progressive accommodation and the changing environments in which it is developed. Bronfenbrenner's work emphasizes the progressive accommodation and the changing environments in which it is developed.
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Family Interaction

The innermost level in the environmental ecology of the child is, as we just saw, the household family. Beginning at this level of the ecological system, one of the basic units of analysis is the dyad, or two-person system (Bronfenbrenner, 1979).

In keeping with the traditional focus of collecting research information on individuals, behavioral and social scientists typically gather data on only one person at a time. Partly because of the difficulties and expense involved in conducting reliable observations of people in interaction, research on Chicanos has seldom included observations of actual family interactions using systematic samples of adequate size. Among the few exceptions is Laosa’s work on maternal teaching strategies. A principal aim of these studies was to contribute empirical data that might help explain, at least partly, ethnic group differences in academic performance.

As Laosa (1981a) makes clear, the choice of maternal behavior in these studies does not reflect a belief that the mother’s behavior is the only important source of influence in the development of the young child or that only biological, mothers, or women, are or should be responsible for the care of children. Many relationships can and do play influential roles in the course of a child’s life. Certainly the father, although ignored in much of the available research, plays a substantial role in the lives of many children. The same can be said of sibling relationships. Nevertheless, in most cultural settings one finds that, of all the relationships during the child’s early years, the ordinary everyday interactions between mother and child constitute a paramount—or at least a very important—aspect of the social environment of childhood. A fundamental assumption is that the mother, in her everyday interaction with her child, continually functions (wittingly or unwittingly) as a teacher. Thus, much of the implicit curriculum and instructional method to which the child is exposed in the home, especially during the early years, is mediated by maternal teaching strategies. A primary focus of the study of mother-child relationships is on identifying diverse patterns of mother-child interaction, how these diverse styles of mother-child relationship develop, and how they relate to particular child behaviors outside of the maternal relationship (Laosa, 1981a).

Research on non-Chicano populations has shown that depending on the family’s social class, mothers use different strategies to teach their young children (for a review of research see Laosa, 1981a). Traditionally in such studies, specific socioeconomic status variables (e.g., mother’s and father’s occupational status and education) have been either employed interchangeably or aggregated under a general index of social class or a global measure of socioeconomic status. But Deutsch (1973) and Laosa (1978, 1981a, 1982b) argue that it may be more appropriate and useful to view social class or socioeconomic status not as a unitary dimension but as a conglomerate of different variables, such as occupation, education, and income, that must be examined separately. One of the issues addressed by Laosa (1978), therefore, centered on the relationship between particular socioeconomic status variables, on the one hand, and maternal teaching behaviors, on the other. Thus, one aim of Laosa’s (1978) study was to ‘unpack’ different components of what is commonly labeled either social class or socioeconomic status, an exosystem factor, and then to examine the influence of these particular components of the exosystem upon the microsystem dimensions of mother-child interaction.

In one study, Laosa (1978) conducted direct observations of Chicano mothers in their homes while they taught cognitive-perceptual tasks to their own 5-year-old children. The sample consisted of forty-three Chicano families residing in Los Angeles; the sample was selected to be as representative as possible of Chicano families in the United States with regard to the distributions of socioeconomic and parental schooling levels. Using the Maternal Teaching Observation Technique (Laosa, 1980b), trained observers recorded the frequency of occurrence of nine categories of maternal behavior. Reliability and short-term stability analyses indicated that these measurements represented adequately reliable and moderately stable attributes of maternal behavior (Laosa, 1980b).

Laosa’s (1978) analyses revealed significant correlations of substantial magnitude between the mothers’ teaching behaviors and their own level of schooling (i.e., years of formal schooling). In contrast, there was very little relationship between these maternal teaching behaviors and either the mothers’ or the fathers’
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summarized as follows: the children of the more highly schooled parents learn to master in their homes the form and dynamics of teaching and learning processes that 'take after' those of the school classroom. Because of this relative similarity, the interactional processes that these children learn to master at home will have adaptive value in the classroom. Insofar as the children of the more highly schooled parents learn to master classroom-like interactional processes in their homes, therefore, they will have a decided academic advantage over the children of the less-schooled parents since the latter, by contrast, learn to master in their homes the form and dynamics of teaching and learning processes that have comparatively little adaptive value in the classroom (Laosa, 1982b). To the extent that the relational systems of family and school differ from one another, the child and the classroom teachers will be unable to draw on a shared process of teaching and learning. As a result of this discontinuity between the family and the school, the child and the teachers will spend a great portion of their time simply attempting to make sense out of one another's behavior. Hence, school failure for many Chicanos probably occurs, at least partly, because they and their teachers are unable to make sense of each other's relational systems. The Laosa (1982b) model further posits — and his data suggest — that the extent to which the family and the school will share in common a relational system for teaching and learning depends, at least in part, on the length of the parents' schooling experience.

Family Constellation

Another feature of a child's microsystem is the family's constellation, that is, such characteristics as the child's family size and sibling structure. Family constellation is relevant to the topic of this chapter for two related reasons. First, demographic statistics show that Chicanos, as a group, differ from non-Hispanic Whites in family constellation (Bean and Tienda, 1987). Second, some researchers have suggested that family constellation influences children's cognitive development (e.g., Zajonc, 1976, 1986). Thus, the question arises: Does family constellation explain the difference in academic performance between Chicano and non-Hispanic White students?

Chicanos, on the average, produce a relatively large number of offspring. Demographic studies demonstrate clearly and consistently that the fertility level of Mexican Americans exceeds those of all other major ethnic or racial groups in the United States, including other Hispanic groups (Bean and Tienda, 1987). Moreover, the fertility difference between Mexican Americans and non-Hispanic Whites is reduced, but not eliminated, when such factors as age, education, income, labor force participation, and generational status are held constant (Bean and Tienda, 1987). Compared to other ethnic groups, therefore, Chicanos have more siblings and, consequently, are less likely to be the firstborn or the only child. Now, juxtapose these demographic differences to the large body of theory and data suggesting that sibling structure and family size influence children's cognitive development, including academic achievement (for reviews see Cicirelli, 1978; Henderson, 1981; Marjoribanks, 1979; Zajonc, 1983, 1986). Indeed, numerous studies, including a few on Chicano families, have examined the relationship between family constellation and children's development. Several
constellation variables have been studied, particularly sibship size (the total number of siblings in a family), birth order (the relative rank of a child in terms of the age hierarchy among siblings), and the presence or absence of a father in the household. This literature, to which we now turn, provides a context for examining the question of whether and how family constellation, among Chicanos, might influence the foundations of intellectual performance that are likely to predict academic achievement.

Sibship size. Many studies have shown an inverse correlation between sibship size and indices of children's cognitive development (e.g., Belmont and Marolla, 1973; Blake, 1989; Bireland, 1974; Kellaghan and Macnamara, 1972). Unfortunately, much of the research on the effects of family size on cognitive development has been subject to confounding. A frequent confounding variable is socioeconomic status (SES), because there is generally a correlation between SES and sibship size; that is, lower SES families generally tend to have more children than the more affluent and better educated families (Westoff, 1986). Because usually there is also a correlation between SES and cognitive test performance (Deutsch, 1973; Hess, 1970), it is difficult to isolate the statistical effects of SES and family size, respectively, on cognitive scores. Kellaghan and Macnamara (1972) addressed this problem by studying Catholic families in Ireland, where large families tend to be valued at all SES levels. Significantly, even in this cultural setting, where it was possible to limit the confounding of sibship size and SES, there was the typical correlation between sibship size and cognitive test performance.

A notable exception to the typical inverse correlation between sibship size and cognitive performance was reported by Rankin, Gaité, and Heiry (1979). These researchers tested the hypothesis that the frequently observed correlation between sibship size and cognitive test performance can be explained on the basis of cultural expectations and values. Their sample consisted of elementary-grade children in American Samoa, a cultural setting where large families are the norm. An instrument especially designed for this cultural population was used to measure cognitive ability. Rankin and his associates did observe an association between sibship size and cognitive performance among Samoan children, but this relationship was curvilinear. Children from families closest to the sibship size that is the norm within Samoan culture attained the highest cognitive performance. In a culture where large sibships are the norm, children in families near the average size showed superior cognitive performance than those from either small or very large families. This finding suggests that cultural values mediate the association between family size and cognitive performance. This conclusion raises the question of whether the observed generalizability of sibship size to Chicanos, since Chicanos are largely different from that of the samples in most of this research. Only a few studies of Chicanos have given explicit attention to the relation of family size to cognitive performance. This research is discussed below.

Some of the early research suggested that the inverse association between sibship size and cognitive performance observed in non-Hispanic White samples may not generalize to Mexican American families. Henderson and Merritt (1968), for example, compared the family characteristics of Mexican American children who scored particularly high on two tests of cognitive ability with the
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Children's development do not occur, or at least do not become visible, before the third year of life.

A comparison between the above finding by Laosa (1984a) and the data reported by Valencia et al. (1981) permits pinpointing the specific age at which the frequently observed zero-order correlation between sibling structure and cognitive performance can first be observed. The average age of the Valencia et al.'s (1981) sample was 4.5 years, and they report zero-order correlations of .24 and .21, respectively, for the number of children in the home and the child's birth order with the child's cognitive score — in spite of the restricted SES range of their sample. In contrast, the age of Laosa's (1984a) samples was 2.5 years, and he obtained a mean zero-order correlation of only .08 between the four cognitive scales in his analyses and these two sibling structure variables for the Chicano sample. These results are all the more impressive when one considers that the SES range in Laosa's (1984a) sample was not restricted, whereas the range of the Valencia et al. sample was highly curtailed. Taken together, these differences between Laosa's (1984a) and the Valencia et al. (1981) data suggest that the frequently observed (zero-order) correlation between sibling structure and cognitive performance emerges initially during the third and fourth years of the child's life.

By means of a principal-components analysis of the fourteen variables for the combined ethnic sample, Laosa (1984a) uncovered three clearly defined factors. (Orthogonal and oblique solutions were obtained, revealing no difference between rotation methods.) Factor 1 was defined by the language variables; Factor 2, by the family constellation variables; and Factor 3 was defined by the socioeconomic and parental schooling measures. 3

Laosa's (1984a) analyses of the children's test scores revealed significant ethnic group differences in the children's verbal, quantitative, and memory performance (no differences in nonverbal reasoning or motor performance). Laosa then performed a series of analyses of covariance in order to ascertain whether these ethnic group differences in children's performance could be explained (statistically) by the three aforementioned factors, either individually or in combination. The results showed that the family constellation factor explained very little, if any, of the ethnic group differences in the children's performance on the ability scales. In contrast, the SES and home language factors accounted for significant portions of the between-group variance in this performance; indeed, the ethnic group differences in children's performance became nonsignificant when the SES and home language factors were simultaneously controlled.

Laosa (1984a) also found that there were no significant within-group correlations of scores on any of the five ability scales with the number of household children, the child's birth order, or whether the child was an only child; this was true in both ethnic groups. It should be noted, however, that Laosa (1984a) obtained significant (positive) correlations between the number of adults (in addition to the parents) residing in the Chicano households and the children's scores on two ability scales — Quantitative and Motor. As Laosa (1984a) notes, the latter finding bears on the confluence theory proposed by Zajonc and Markus (1975), a theory discussed in the next section.

In sum, both Laosa (1984a) and Valencia et al. (1981) found that, at least during early childhood, neither the number of children in the home nor the
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Whether the empirical findings apply to other cultural groups. The question of whether the model is generalizable to other populations was addressed in a study of a large sample of college applicants in Colombia, South America (Velandia et al., 1978). Neither the predicted associations between birth order and intelligence nor the relation of intelligence to family size were upheld. In a follow-up study with a large national sample in the United States, Page and Grandon (1979) found that the apparent effects of family size were best explained by ethnic group and social class variables. These results are consistent with those obtained by Laosa (1984a) and Valencia et al. (1981) for Mexican American young children. The little research that exists on Mexican American samples shows no significant effects of sibship size or birth order on intellectual development once proper controls for other background variables are taken into account (Laosa, 1984a; Valencia et al., 1981) — more precisely, if any such effects occur, they are not evident in early childhood.

Single Parenting

The aforementioned studies of Chicano families by Laosa (1984a) and Valencia et al. (1981) focused on two-parent families — that is, on households in which the child resided with both mother and father. By designing their sampling plans in this manner, these investigators successfully avoided confounding their results with possible effects due to differences between one- and two-parent families. Although a large majority of Chicano children reside with two parents, some of them live in solo-parent households; in 1988, 18.5 per cent of the Mexican-origin families in the United States were headed by a woman with no husband present (US Bureau of the Census, 1988; see also Laosa, 1988a).

The issue is important because the research literature suggests that compared with children in two-parent households, those in single-parent homes are more likely to develop academic and conduct problems in school (for a review see Hetherington, Camara and Featherman, 1983). Because almost all of this research is based on non-Hispanic White or Black samples, the question arises as to whether these findings generalize to Chicanos. Do Chicano children in solo-parent families develop differently from those in two-parent households? Is the scholastic performance of Chicano children affected by whether they live with one or two parents? Are there features of Chicano culture that serve to buffer or moderate the effects of solo parenting observed in children from other cultural groups?

These questions were addressed by LeCorgne and Laosa (1976) in a study designed to test the null hypothesis of no effects due to solo mothering on Mexican American children's cognitive and psychosocial development. The sample consisted of 248 fourth-grade students in a predominantly Mexican American, urban area in south-central Texas. About half of the children were selected for the sample because they did not have a father or male father surrogate (other than an older sibling) living at home, whereas the other half were randomly selected from among those living in two-parent households. Only Mexican American families at or below the poverty level were included. The data were analyzed using a $2 \times 2$ (father presence/absence by child's sex) analysis of covariance (child's chronological age covaried). LeCorgne and Laosa's analyses
covered important differences between Mexican American children of the two family types.

Among the dependent variables examined by LeCorgne and Laosa were classroom teachers’ ratings of the students’ psychosocial adjustment. The teachers were instructed that school achievement was not to be a consideration in making the personal adjustment ratings, but that the child’s ‘self-concept and relationship to others’ (p. 470) should be the major consideration. The analyses revealed that both the main effect of family type and the interaction with child’s sex were significant for this variable. Specifically, the teachers’ ratings showed more signs of school maladjustment in boys of solo mothers than in boys of two-parent homes or in girls of either family type. This finding suggests a differential effect of father absence on boys and girls.

LeCorgne and Laosa’s (1976) finding of a significant family-type-by-child’s-sex interaction for teachers’ ratings of Mexican American children’s school adjustment is consonant with data on other populations suggesting that boys are more susceptible to certain forms of stress than girls (e.g., Rutter, 1979). Although little is known about the reasons for this sex difference, recent reviews of the research literature do indeed point to the conclusion that boys may respond more negatively than girls to some forms of psychosocial stress, including the stresses from divorce (Heatherington et al., 1983; Zaslow, 1987; Zaslow and Hayes, 1986). LeCorgne and Laosa’s (1976) findings add confirmatory evidence for this general hypothesis and extend it by showing that the sex difference in vulnerability to certain forms of psychosocial stress, a vulnerability that has been observed in research on other ethnic populations, is generalizable to Mexican Americans. Specifically, LeCorgne and Laosa’s data show that solo mothering appears to have no deleterious effect on Mexican American girls’ psychosocial adjustment to school (at least during middle childhood), whereas something as yet undetermined about the experiences associated with solo mothering seems to affect negatively the school adjustment of Mexican American boys.

A plausible explanation for this sex difference, offered by Heatherington et al. (1983), is that separation from the father may represent a more important loss for a male than for a female, both as a figure of identification and as a disciplinarian. Research indeed suggests that girls in father-custody families exhibit some of the same difficulties in social behavior as do boys in mother-headed, one-parent families (Camara and Resnick, 1988; Santrock and Warshak, 1979; Santrock, Warshak and Elliott, 1982). This finding suggests that separation from the same-sex parent may be particularly difficult for children. Given the present, most common custodial arrangements (Maccoby, Davenport and Mnookin, 1988), therefore, boys may be at higher risk for deleterious outcomes from family disruption and divorce than are girls.

LeCorgne and Laosa’s (1976) study also included three measures of the children’s cognitive- perceptual development — the Raven Coloured Progressive Matrices, the Goodenough-Harris Drawing Test, and the Bender-Gestalt Test. There were no significant differences between family types (and no interactions with sex) for either Raven or Bender-Gestalt developmental scores. There was, however, a significant difference in Goodenough-Harris scores, suggesting a higher level of conceptual development for the group of two-parent children. In interpreting this result, LeCorgne and Laosa point out that, although the sample included only poor families, this difference in cognitive performance could be the outcome of very small differences in socioeconomic level between the two family types. National statistics show lower average incomes for solo-mother than for two-parent households (Laosa, 1988a); and the lower a family’s economic status, the more important small dollar differences may become. Indeed, Harris and Roberts (1972) found a noticeable increase in mean Goodenough-Harris scores between children from families with incomes of less than $3,000 and those of $3,000 to $4,999.

The latter observation brings forward yet another effect of diversity in family structure, namely, family income. Laosa (1988a) recently examined the economic implications of single parenting. His analyses, as mentioned above, clearly show that solo mothers and the children living with them are, on the average, economically disadvantaged compared with those in two-parent families; this is true irrespective of ethnicity or race. This situation is partly the result of sex inequalities in income, as the average woman earns lower wages per hour than does the average man (Fuchs, 1986). Even when all of the variance predicted by family structure can be explained by the socioeconomic level of the family, however, we should not ignore the causal links in the process (Heatherington et al., 1983). Divorce, separation, or death of a spouse may create low socioeconomic conditions in the home, and such conditions in turn can influence the child’s academic attainment.

Environmental Processes in the Home

Whereas some studies of socialization, such as those discussed in the preceding section, focus on the influence of ‘molar-level’ sociodemographic variables on children’s development — such as household income, parental education and occupation, family size and structure — other studies attempt to examine the effects of ‘micro-level’ processes. Such micro-level processes are often hypothesized to act as intervening or mediating variables that may explain the association between the molar-level factors and the child’s development. A good example of micro-level processes are the data on teaching strategies that Laosa (1978, 1980a, 1982b) obtained through direct observations of the interactions between Chicana mothers and their own children, discussed elsewhere in this chapter. In this section the focus is on research in which interviews — rather than direct observations — are used to obtain data on micro-level processes in the home.

Among the early research on environmental process variables is the work stimulated by Benjamin Bloom, who recognized the need for knowledge about the learning processes that occur in the home and other features of the home environment that facilitate intellectual development. Two of Bloom’s doctoral students — Davé (1963) and Wolf (1964) — hypothesized several home effects on intellectual performance on the basis of an extensive literature review, and they devised a focused interview approach to measure them. Davé and Wolf found that the home environmental process variables that they measured through interviews with (non-Hispanic) parents of elementary-grade children were remarkably good concurrent predictors of both academic achievement (multiple R = .80 and IQ (multiple R = .70). These associations have been replicated in different countries (Marjoribanks, 1979) and with different cultural groups, including Mexican Americans (Henderson, 1966; Henderson and Merritt, 1968).
The principal environmental process variables in these studies are represented by those employed in Dave's (1963) research; among them are 'achievement press', 'language models', 'academic guidance', 'activeness of family', and 'intellectuality in the home'. The measurement procedures are intended to identify specific parental behaviors rather than statements of attitudes or intentions. For example, parents' goals and aspirations for their children are subsumed under the 'achievement press' variable. Interview items and probes relevant to this variable are designed to identify and quantify such parental behaviors as the reinforcement practices for the child's academic performance and the achievement standards on which these practices are based. Additional indices of this variable are derived from interview questions tapping into parents' concrete knowledge of the developmental and educational progress of their children and into the specific plans and preparations they have made to accomplish the educational goals they claim to hold for their children. The influence of role models, too, is taken into account in composing the 'achievement press' variable; this is done by incorporating information on the educational and occupational attainments of family members and friends. Further exemplifying Dave's and Wolf's measurement procedures, the 'language model' variable is based on ratings of the parent's own language during the interview, including such language characteristics as richness and variety of vocabulary, fluency of expression, and the organization of thought as expressed through speech. This variable also comprises information on the parent's awareness of specific features of the child's use of language and on the nature of the parent's direct efforts to influence the child's language development.

Building on the work of Dave and Wolf, Henderson (1972) demonstrated that the aforementioned kinds of environmental process variables can distinguish the families of Mexican American children who perform well on cognitive measures from those who do poorly. Henderson (1972) later showed that, for the same children, these environmental process variables predicted academic achievement over a three-year period. Specifically, Henderson and Merritt (1968) studied eighty Mexican American Spanish-speaking first-grade children in Tucson, Arizona. Two groups comprised the sample: half of the children were selected because of their very high scores on the Goodenough-Harris Drawing Test—a measure of general conceptual development—and the Van Alstyne Picture Vocabulary Test; the other half were chosen because of their very low scores. From individual interviews with the mothers, the researchers obtained ratings on thirty-three characteristics of the home that defined nine environmental process variables generally similar to those that Dave and Wolf had identified earlier. The analyses revealed significantly higher means on the environmental process variables for the group scoring higher on the cognitive tests. Thus, the processes taking place in the homes of the Mexican American children who scored high on these cognitive tests apparently differed in specific ways from the homes of those who scored low. It should be pointed out, too, that the analyses also revealed that the mothers of the high-scoring children had, on the average, more formal education and a higher socioeconomic status than did the mothers of the low-scoring children.

In a follow-up study, Henderson (1972) administered the California Reading Test to thirty-five children of the original Mexican American sample when they were in the third grade and correlated these third-grade reading achievement scores with the home environmental process measures obtained two years earlier. Henderson (1972) reports a predictive bivariate correlation of .55 between the reading achievement scores and the combined score for the various home environmental process variables. This finding is congruent with that obtained by Wolf (cited in Henderson, 1981), who followed his aforementioned (non-Hispanic) sample over a four-year period and found that the multiple correlation between IQ at this time and the environmental process variables measured earlier was only slightly lower than the original, concurrent coefficient. These findings do not establish cause, but they do demonstrate reasonably long-term predictive stability for the measures of environmental processes in the home.

The approach that Dave (1963) and Wolf (1964) developed for the measurement of environmental processes in the home thus proved to be an exceptionally good predictor of intellectual performance, but the method is time consuming and requires the services of skilled interviewers. For this reason, Henderson, Bergan and Hurt (1972) set out to develop an interview schedule, adapted from Dave's (1963) and Wolf's (1964) method, that could be more easily administered and coded. The resulting instrument—the Henderson Environmental Learning Process Scale (HELPs)—is a structured questionnaire using a Likert-type response format. It is designed to provide measures of educationally relevant processes in the home that can be subject to change through intervention programs in the school and in the home. The items composing this instrument focus primarily on specific experiences provided for the child in the home and on patterns of interaction among family members, but they also tap parental attitudes and such factors as the parent's aspirations and expectations for the child. Although the information yielded by the HELPS is less detailed than that provided by focused interview procedures, it has the advantage of requiring less than twenty minutes to administer, and little training is required for its administration.

In order to assess the predictive validity and other psychometric properties of the measures obtained by the HELPS, Henderson et al. (1972) administered the Stanford Early Achievement Test and the Boehm Test of Basic Concepts to sixty low-income Mexican American and sixty-six middle-SES non-Hispanic White first-grade children in Tucson, and the HELPS to their mothers. The analyses in this study were performed on the combined ethnic sample. A principal-components analysis of the twenty-five HELPS items yielded five factors. The HELPS items loading on the first factor reflected opportunities taken by parents to expand their own and their child's social and intellectual interests and experiences. Specific items tapped such parental behaviors as having discussions with the child about programs viewed on television, seeking answers to the child's questions by consulting a book (in the child's presence), encouraging the child to read, and extending interpersonal contacts via participation in clubs or organizations and visits with friends in neighborhoods other than one's own. The second factor was characterized by the label, 'Valuing Language and School Related Behavior'. Specific parental behaviors identified by items loading on this factor included such interactions as explaining the sequence of steps for performing particular tasks, praising the child for approved behavior at school, and talking with the child at mealtimes. The third factor, labeled 'Intellectual Guidance', was defined by such items as helping the child with homework, pointing out features of intellectual interest during outings, and reading to the child during the preschool years. The items loading on Factor 4 appeared to involve attempts to
pare the child to function well in school without attempting to duplicate directly the functions of a school teacher. Included here were opportunities to obtain school-related information through such community resources as libraries and museums, providing an intellectual atmosphere by modeling the use of printed materials, communicating verbally with the child, and being aware of specific features of the child's language development. The final factor, labeled 'Attention', reflected a variety of ways in which parents attend to behaviors that seem likely to stimulate intellectual development. Mothers who scored high on the items loading on this factor were likely to provide attention by showing interest in the child's learning and by calling attention to the child's use of language.

In order to ascertain whether the home environmental process variables as measured by the HELPS correlate with academic performance, Henderson et al. (1972) performed stepwise regressions (for the combined ethnic sample), using HELPS factor scores as predictors (concurrent) and the test scores as criteria. The results showed that together the HELPS factors accounted for the majority of the variance in cognitive test scores (e.g., a multiple R of .72 for the Boehm). The Henderson et al. (1972) HELPS is, then, a practical questionnaire that can be administered to large samples and scored with relative ease and that identifies variables reflecting environmental processes in the home that correlate highly with measures of children's academic achievement and conceptual development. The measure has demonstrated good qualities of reliability and predictive validity when adapted for use with varied populations in different community settings (e.g., Kitonyi, 1980; Prior, 1974; Valencia, Henderson and Rankin, 1985).

The HELPS was used in a study by Valencia and associates (1985) to assess the relative contributions of socioeconomic status, parental schooling level, home language, sibship size, and home environmental processes to the cognitive performance of Mexican American preschool enrollees from low-income, two-parent households. Multiple regression analyses revealed that the home environmental processes, as measured by the HELPS total score, accounted for more unique variance in performance on the General Cognitive Index of the McCarthy Scales of Children's Abilities than did any of these other variables. The next largest portion of unique variance in cognitive scores was explained (statistically) by a composite variable comprising parental schooling level and use of English over Spanish in the home. Finally, parental occupational status and sibship size did not add significantly to the prediction (concurrent) of cognitive scores. These findings provide support for Laosa's theoretical model (Laosa, 1982b; Marioribanks, 1984), according to which parental schooling level exerts an indirect influence on children's developmental trajectories by affecting how parents interact with their children.

Another influential approach to the measurement of home environments was developed by Bettye Caldwell and her associates. Caldwell's Home Observation for Measurement of the Environment (HOME) Inventory has been used in numerous studies of the relation of home environments to the development of competence, and it has proven to be a good predictor of (non-Hispanic) children's intellectual performance (e.g., Bradley et al., 1989; Bradley, Caldwell and Rock, 1988; Elardo, Bradley and Caldwell, 1977). This instrument is designed to assess the stimulation and support available to a child in the home environment. Information needed to score the inventory is obtained through observation and interview done in the home with the child and the child's primary caregiver (Caldwell and Bradley, 1984). As is the case with variables based on the measurement approach developed by Dave (1963) and Wolf (1964), the HOME Inventory has been found to be a more effective predictor of mental test performance than have global indices of SES (e.g., Bradley et al., 1989). The HOME Inventory is not, however, an equally effective measure for all ethnic groups.

In one study (Elardo et al., 1977), the predictions of intellectual performance at age 3 years from HOME scores obtained a year earlier held up for samples of both Black and non-Hispanic White families. Although intellectual performance scores were significantly associated with HOME scores in both ethnic groups, the relation was not as strong for Black as for non-Hispanic White families. The investigators speculated that the attenuated association between HOME and intellectual performance scores for Black families might have been the result of a range restriction in the intellectual performance scores for the Black sample or of a lower validity of HOME scores for Blacks than for non-Hispanic Whites. More recently, Bradley et al. (1989) examined the relationship between HOME scores and measures of children's intellectual development in Black, Mexican American, and non-Hispanic White samples; the samples were matched on HOME scores. Importantly, the results of this major study showed that, whereas the HOME scores significantly predicted intellectual performance for the non-Hispanic White and Black samples, the corresponding coefficients for the Mexican American sample were nonsignificant and near zero. These findings add support to Laosa's argument that there is a need to assess the measurement properties of data separately by ethnic group (Laosa, 1977b, 1982c). The findings also contribute to the growing evidence justifying Laosa's exhortations to practitioners and policymakers cautioning them against generalizing research results across different ethnic populations in the absence of supporting empirical evidence (Laosa, 1981b, 1988b, 1990).

In sum, studies of relations between home environmental processes and intellectual development show that measures of specific characteristics of home environments account for a statistically and educationally significant portion of the variance in children's intellectual performance, and that they provide stable predictions over time. With children of varied ages, and spanning a number of cultural groups and socioeconomic statuses, it has been shown that experiences and expectations in the family setting are associated with children's intellectual development. Measures of home environments can provide information of a specific nature about the actual experiences that differentiate between intellectually higher and lower performing children. At the same time, a small but growing number of studies underscore the need for caution in assuming — in the absence of appropriate evidence — that research findings obtained for a particular cultural population generalize to different ethnic groups.

The studies discussed thus far in this chapter offer correlational information and are therefore suggestive of — but not definitive about — causation. A few studies have been conducted to identify causal connections between home environment variables and intellectual performance, either by testing causal hypotheses using special statistical procedures (e.g., Bradley, Caldwell and Elardo, 1979; Laosa, 1982a) or by experimentally manipulating parenting behaviors. An example of the latter is a study by Henderson and Garcia (1973), discussed below.
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Intervention Experiments

For obvious reasons, it is impossible to assign children randomly to different kinds of home environments at birth and observe the results. It is possible, however, to manipulate selected aspects of parental behavior on the basis of causal hypotheses derived from correlational findings. It then becomes possible to determine if the manipulated home practices influence the children's development in the predicted direction. This approach differs from large-scale parent training programs of the type that were popular in the 1970s (for reviews see Goodson and Hess, 1975; Haskins and Adams, 1983; Zigler and Weiss, 1985), because those intervention programs commonly manipulate several aspects of parental practice simultaneously, in ways that make it impossible to compare systematically the particular outcomes of specific practices. In contrast to such interventions with global objectives, a few studies have manipulated and assessed the effects of a narrow range of specific variables suggested by the research on family environments.

In one such study, Henderson and Garcia (1973) tested the hypothesis that parents can be trained to adopt the kinds of behavior that may facilitate their children's academic performance. Mexican American mothers of first-grade children in a low-income neighborhood in Tucson, Arizona were selected to participate in the experiment. Half of the mothers in a sample of sixty families were randomly assigned to the experimental group; the remainder served as controls and received no treatment. The mothers in the experimental group were trained by the experimenter to model, cue, and reinforce their children's inquiry skills—question-asking behavior on the basis of empirical data—regarding the use of questions as a teaching strategy by Chicano mothers with their own children. To illustrate the implications of their findings for education, Henderson and Garcia offer the following analogy. The experimental and control children, drawn randomly from a single population, appear in the posttests to represent two different populations: high achievers and low achievers on the specific tasks of the study. This difference, however, is not attributable to a corresponding difference in the aptitudes of the children. Rather, it is attributable to the fact that the experimental group of children received a particular kind of instruction and support at home, whereas the controls did not. This situation may be parallel to the natural circumstances in which children's school performance is facilitated by the types of interaction that take place in their homes.

Field experiments have demonstrated also that environmental processes modeled on those investigated in correlational studies of home environments can influence specific components of academic motivation. Swanson and Henderson (1976), for example, conducted such a study in response to a request from Papago parents. These parents were interested in learning to influence their children to become more interested in, and successful at, reading. Swanson and Henderson, therefore, designed a field experiment to test the hypothesis that children would choose activities of the sort that were reinforced through the overt approval or attention of a significant person in the home environment. Specifically, these investigators hypothesized that students whose mothers were trained in procedures to influence children's preferences for reading activities would (a) show an increase in their selection of reading materials over attractive alternatives, and (b) display generalization of this preference to the classroom. The participants in the experiment were families with a second-grader on the Papago Indian Reservation in Arizona. During a series of training sessions, the mothers in the experimental group were taught a series of behavior sequences for interacting with their children. After each session, they practiced at home, interacting in a warm, supportive way with their own children in situations focused on children's books, as follows. At designated intervals, the mother laid out reading materials, together with other toys and games that were attractive to children. She provided differential reinforcement by expressing her approval and engaging in affectionate interactions whenever her child approached and examined the reading materials; the mother merely continued her household routines when the child chose other materials.

Two different tests of the effects of the intervention were conducted. A
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mathematics, a domain in which parental belief systems are likely to influence children's self-concepts of ability and expectancies of success, their future achievement in this subject, and their course enrollment plans (Eccles, 1983).

Public concern about the school achievement of Chicanos has tended to focus largely on literacy and literacy-related skills, perhaps because of a general belief that the academic obstacles facing this ethnic group stem only from linguistic factors. Because the symbols and operations associated with mathematics are assumed to be common across languages, mathematics learning may receive less attention than other subjects. Whatever the cause for this neglect, the fact is that Chicano students are as much 'at risk' for low achievement or failure in mathematics as they are in other subjects (Durán, 1983; Educational Testing Service, 1989; Laosa, 1985; Sawyer, 1987).

Competence in mathematics is especially important for achievement in scientific and engineering fields and, increasingly so, for adequate functioning in other professions as well. Nevertheless, Mexican American pupils perform below norm in mathematics, as a group, and are less likely than the average student to enroll in mathematics courses (as they are in academic courses generally) that prepare them for college study toward these careers (Ramist and Arbeiter, 1986). The High School and Beyond study of high school sophomores and seniors is a valuable source of information on this point, because it included a sample of 4,016 Mexican Americans who were oversampled randomly from the general population of high school students. Analyses of these data by Nielsen and Fernandez (1981) revealed that Mexican Americans performed lower than non-Hispanic Whites in every achievement area that was assessed, including mathematics. Non-Hispanic Whites showed a one standard deviation advantage over Mexican Americans in tested mathematics, reading, and vocabulary. Other relevant, and more recent, data come from college-bound seniors who take the Scholastic Aptitude Test (SAT) for college admissions, which is intended to measure developed ability in the use of language and in simple mathematics reasoning as might be expected of students in undergraduate college coursework. Analyses of SAT scores in 1989 reveal a sixty-five-point advantage for non-Hispanic Whites over Mexican Americans on the verbal section, and a sixty-one-point advantage in mathematics (Educational Testing Service, 1989) — these are differences of about two thirds of a standard deviation (Ramist and Arbeiter, 1986). The American College Testing Program (ACT) college-admissions test shows the same pattern of ethnic-group differences for first-year college students — non-Hispanic Whites outperform Mexican Americans by about one standard deviation on every ACT subtest (i.e., English, mathematics, natural sciences, and social studies; Sawyer, 1987). These various data sets likely underestimate the true achievement differences, because they exclude school dropouts — who are usually among the lowest achievers (Steinberg, Blinde and Chan, 1984) — and the dropout rate is higher for Mexican Americans than for non-Hispanic Whites (Orum, 1986; Runzheimer, this volume).

Not only do Mexican American students as a group score lower than the norm on achievement tests of quantitative skills, but they also take fewer courses in mathematics than the average pupil; this is true even considering only seniors who seem to be planning to enter college (MacCorquodale, 1988; Ramist and Arbeiter, 1986). The relatively low participation of Mexican American students in advanced high school electives in mathematics is troublesome, because it...
constitutes a pattern of choice that closes off options to participate in science-related occupations and in many of the social science or business college courses that require quantitative backgrounds as well.

Direct evidence on the nature of the processes that contribute to the observed poor achievement in mathematics and low participation in elective mathematics courses among Mexican Americans is scant, but one wonders whether studies of factors that contribute to sex differences in intellectual performance in other populations might yield some insights into the kinds of processes responsible for the ethnic group differences as well. The study of sex differences has a long history in psychology, and gender is a widely used variable in psychological research. Because most research with children involves both boys and girls, and investigators typically carry out at least perfunctory tests for sex differences, the body of research on sex differences is large (Jacklin, 1989). The earlier research comparing male and female performance averages on intellectual tasks showed sex differences in verbal, mathematical, and other abilities, but trend data point to a gradual narrowing or closing of these gaps during the last two decades (for a recent review of research see Wilder and Powell, 1989).

The historical advantage of females in the verbal domain appears to have been virtually eliminated, and the superiority of males in certain mathematical areas seems less substantial now than in the past. A notable exception to this converging trend is in the upper ranges of tested mathematics performance, where the ratio of boys outscoring girls has remained fairly constant over the years (Fennell, 1988; see also Educational Testing Service, 1989). This sex difference emerges around the time of adolescence (cf. Laosa and Brophy, 1970, 1972; Wilder and Powell, 1989), as exemplified by the higher average scores of males than of females on the mathematics sections of college-admissions tests. Among high school seniors in 1989 (combined ethnic groups), the mean SAT mathematics score of males was forty-six points higher than that of females—a difference of more than one-third of a standard deviation—-which contrasts with a sex difference of only thirteen points on the test's verbal section (Educational Testing Service, 1989). Course-taking patterns also differ by sex. Males take a greater number of advanced mathematics courses on the average than females, even in high school (Batton, 1989). Significantly, this pattern of sex differences in standardized test scores and in course-taking, which we see among non-Hispanic Whites, is also present among Mexican Americans, although Mexican Americans, whether male or female, score lower and take fewer math courses on the average than non-Hispanic Whites of either sex (MacCorquodale, 1988; Ramist and Arbeiter, 1986; Sawyer, 1987).

Several hypotheses have been advanced in attempts to explain the observed sex differences in mathematics performance and course participation (for reviews see Eccles and Hoffman, 1984; Wilder and Powell, 1989). Among these hypotheses is a plausible explanation that focuses on the cumulative effects of early socialization patterns and that implicates parents and teachers as expectancy socializers. A growing body of research is accumulating on the role of attitudes and expectations in creating or promoting sex differences in mathematical attainment, although these studies are largely on non-Hispanic samples. The existence of a sex difference in expectancy for success in mathematics and in self-concept of mathematical ability from middle childhood on is now well documented (Dossey, Mullis, Lindquist and Chambers, 1988; Eccles, 1983; Entwisle and Baker, 1983; Stevenson and Newman, 1986), but the developmental origins of this difference remain unclear. Eccles (formerly Parsons) and her colleagues argue that parents (Parsons, Adler and Kaczala, 1982) and teachers (Parsons, Kaczala and Meece, 1982) may be perpetuating, if not creating, these sex differences. These investigators designed a study to test the hypothesis that parents contribute to the sex differences in achievement expectancy and self-concept of mathematical ability through their beliefs about their children's abilities, the difficulty of math itself, and the importance of taking math courses (Parsons, Adler and Kaczala, 1982). The data provided confirmatory evidence for the hypothesis. The results showed that both mothers and fathers held sex-differentiated perceptions of their children's mathematics aptitude despite the similarity of the actual performance of boys and girls (non-Hispanic fifth to eleventh graders from middle- to upper-class homes). Parents of daughters believed their child had to work harder to do well in math than did parents of sons, whereas parents of sons thought advanced math was more important for their child than did parents of daughters. Moreover, parents' perceptions of and expectations for their children were related to the children's self- and task-perceptions. Similar results have been reported for younger children (Alexander and Entwisle, 1988; Entwisle and Baker, 1983). These findings point to the potential importance of parents' roles as expectancy socializers. Research further suggests that children's self-concepts of mathematical ability may, in turn, influence their actual performance (Stevenson and Newman, 1986). Other studies suggest a similar, though less substantial, influence by teachers (Eccles, 1983; Parsons, Kaczala and Meece, 1982). In sum, a number of studies suggest an influence on children's attitudes toward mathematics and hence on their mathematical attainment by parents and teachers' gender-stereotyped beliefs and expectations. Such influences appear to be at the root of sex differences in mathematics attainment. These findings are based on non-Hispanic samples, and one may hypothesize similar processes for Mexican Americans; however, this remains an empirical question. It is for future research to ascertain whether or not the processes that account for sex differences in non-Hispanic Whites also explain the sex differences among Mexican Americans.

A different generalizability question is whether or not the processes that account for sex differences also explain the ethnic group differences. Berryman's (1983) study suggests a negative answer. She studied the causes of representation of women and of certain ethnic groups—including Chicanos—among holders of BA, MA, and PhD degrees in the quantitatively based disciplines. Berryman's analyses suggest 'fundamentally different causes of women's and minorities' underrepresentation' among recipients of quantitative degrees. For women, the causes 'seem to be the familiar motivational factors that shift girls' interests away from the sex atypical careers and the high school mathematical sequence associated with quantitative postsecondary training'. For Chicanos, on the other hand, 'the major factors seem to be family socioeconomic status, especially parental education, with its: (1) ... effects on educational aspirations and high school mathematical and science achievements, and (2) ... effects on career information and career preferences' (1983, pp. 105–6). Berryman's findings seem consistent with MacCorquodale's (1988) hypotheses regarding parental influences on Mexican American children's mathematics achievement and general educational attainment. Also germane to the issue of generalizability are the findings of a number of studies suggesting that teachers respond more to a student's racial and
three variables may be especially influential in regard to children's development in quantitative-related areas (e.g., Berryman, 1983; Marjoribanks, 1979). For example, Berryman (1983) points to parental education level as a major influence on Chicano students' curricular choices. Berryman's analyses showed that Chicanos were indeed generally underrepresented in college mathematics, science, and engineering courses, but those Chicanos with a college-educated parent were almost as well represented in these courses as non-Hispanic Whites — in contrast to the pattern for Chicanos who were the first in their families to attend college.

In sum, research on the socialization processes influencing Chicanos' achievement in mathematics or their participation in this subject is scant. It does seem clear, however, that the level of formal education attained by parents constitutes an important influence on their attitudes toward and expectations for their children's participation and performance in mathematics. At the same time, the literature on sex differences in other ethnic populations indicates that women's relatively low participation and achievement in mathematics is related to the expectations and perceptions that their parents held about the women's early mathematical ability, with parents of girls generally expressing lower expectations and making lower ability estimates than those of boys. Beyond the importance of this knowledge in its own right, it has been suggested that an awareness of the research on the processes that affect the participation and achievement of women in mathematics and quantitative-related fields might contribute to our understanding of the kinds of influences involved in opening or closing avenues of opportunity for Chicano students. Although they do have an intuitive appeal, we strongly caution against making such generalizations, given the research evidence (e.g., Berryman, 1983) suggesting that the variables and mechanisms accounting for sex differences are fundamentally different from those determining ethnic group inequalities.

**Concluding Comments**

The focus of this chapter is primarily on the innermost level in Bronfenbrenner's (1979, 1988) four-level conception of the human environmental ecology, namely, the microsystem — and, more specifically, the child's socialization in the family. We reviewed and discussed selected research studies attempting to illuminate various factors within the family setting that may influence Chicano children's academic development. In addition to the family, the microsystem contains settings that, too, can be important socializers and determinants of academic development — including the school itself, the peer group, and the media. Similarly, the other levels of the environmental ecology — the exosystem, the mesosystem, and the macrosystem — exert their own important, although indirect, influences on the child. These other socialization settings and ecological levels must be examined along with the family in any attempt at a comprehensive analysis of Chicano children's academic development — if such a task were possible. The point is that the family is important, but the other settings and levels of the human ecology should not be ignored.

Indeed, the results of the research reviewed and discussed in this chapter implicate all four levels of Bronfenbrenner's ecological system. As an illustration,
Consider Laosa's research on maternal teaching strategies. It will be recalled that Laosa (1978, 1980a, 1982b) conducted direct observations of Chicana mothers in their homes while they taught their own children. Among Laosa's findings was a substantial relationship between the kinds of teaching strategy employed by the mothers and the number of years of formal schooling that they themselves had attained. Although correlational, these data suggest that a mother's choice of strategies for teaching her children in the home is determined by the mother's own schooling level. Laosa's data revealed that the higher a mother's schooling level, the more her teaching strategies resemble those that one generally expects to find in school classrooms, thereby likely facilitating her child's adaptation to school. This finding thus implicates all four levels of Bronfenbrenner's ecological framework in the academic development of Chicanos, as follows. The mother's years of schooling correspond to an exosystem variable; that is to say, the events that in the past the mother had herself experienced as a student in school are now indirectly affecting her child's immediate environment, or microsystem. Further, the findings bearing on home-school similarities in teaching strategies suggest a mesosystem relation between home and school.

Finally, any policy implications that one might draw from these findings point to macro system considerations. On the level of Bronfenbrenner's macrosystem belong a society's policies. Many aspects of the present-day social and educational inequalities affecting Chicanos can be understood only in light of the caste-like structures that have evolved out of the earliest contacts and interrelationships between this population and other US ethnic groups (Carter and Segura, 1979; Laosa, 1984b). As Bronfenbrenner (1979, 1988) reminds us, the macrosystem can be altered through policy change, with the result that there will be change bearing on the society's exosystem, mesosystem, and microsystem structures.

The study of Chicano children's socialization is still in its infancy — so much so that no attempt is made here to list the myriad research questions that need to be addressed in future research. Many of these questions are raised, however, throughout the chapter — implicitly or explicitly. As shown here, the research literature has moved some distance — both empirically and theoretically — toward specifying the variables and mechanisms in the socialization process that seem to mediate, at least partly, Chicano children's intellectual development and academic attainment; but much remains to be done. We require more studies that illuminate how the socialization process interacts with other levels of the environmental ecology to create and maintain patterns of ethnic group differences in academic learning, scholastic motivation, and movement through the schooling process. It is hoped that this chapter will point researchers in interesting directions toward work that further specifies these mechanisms and that traces their precise effects on Chicano children's academic development.

A large proportion of the academic achievement effects of ethnic group membership appears to be transmitted by mechanisms that in principle are susceptible to control by educators and policy makers. By broadening and deepening our understanding of the nature and action of these mechanisms, research programs such as those reviewed in this chapter can increase our capacity 'to make wise, effective policy in pursuit of an equitable distribution of life chances' (Bidwell and Friedkin, 1988, p. 468). 

Notes

1 In this chapter, we interchangeably use the terms Chicano and Mexican American to refer to persons of Mexican origin or descent in the United States. In the Spanish language, Chicana corresponds to a female referent, and Chichon, the male; Chicano is also the appropriate term for the gender aggregate. In describing and discussing particular studies, we generally use the terms chosen by their authors in reference to their respective samples.

2 The difference in factorial structure between Laosa's (1984a) and the Valencia et al. (1981) data is likely the result of the difference in the sampling designs of the two studies.

3 Only a very small proportion of families are headed by a man with no wife present: as counted in the 1980 US census, only 3.1 per cent of the Mexican-origin families with own children under 18 years of age were headed by a man with no wife present (Laosa, 1988a).

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