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A comparative study of young adolescent, older adolescent, and adult mothers on knowledge of child development, perceived parental competence, and problem-solving ability

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A COMPARATIVE STUDY OF YOUNG ADOLESCENT, OLDER ADOLESCENT, AND ADULT MOTHERS ON KNOWLEDGE OF CHILD DEVELOPMENT, PERCEIVED PARENTAL COMPETENCE, AND PROBLEM-SOLVING ABILITY

by

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CHAPTER I

INTRODUCTION AND REVIEW OF THE RELATED LITERATURE

Parenthood is a major social role which is often thought of as an instinctive process. With the birth of a baby, parents are expected to be fully equipped with the knowledge, love, and skills to raise a healthy, happy child. Yet, increasing awareness of the magnitude of such problems as child abuse and neglect have led researchers to evaluate the assumption that the ability to raise children is a natural talent possessed by most parents (Newberger, 1980; Holden & Ritchie, 1988). Parenting is a complex and difficult process, more accurately viewed as an acquired skill. Due to the complexity of parenting, it is becoming apparent that the skills and responsibilities required to raise children are challenging to even the most mature adults.

The complexities of parenting are even greater for adolescent parents who must face the normative changes of their developmental stage along with the stresses of parenting (Sadler & Catrone, 1983; Young, 1988). Each year in the United States, over one million teenagers between 15 and 19 years of age become pregnant; 600,000 choose to deliver the offspring. Of these, over 95% choose to keep their babies (Alan Guttmacher Institute, 1981; Furstenberg, 1991). Among those who keep their babies, less than half

marry, leaving the vast majority of these adolescent girls as single parents (Furstenberg, Brooks-Gunn, & Chase-Lansdale, 1989; Roosa, Fitzgerald, & Carlson, 1982).

With the recognition of adolescent pregnancy as a major national health and social problem, the consequences of early parenthood, for both the children and the young mothers, have increasingly become the subject of theoretical speculation and empirical investigation. Accompanying the high rate of adolescent childbearing and child rearing is a growing number of reports indicating that children of adolescent mothers are more vulnerable to a number of health risks, including disease, physical disability, and infant death (Hofferth, 1987). In addition to the numerous health risks that the children of teenage mothers face, they are also at greater risk of cognitive deficits and socioemotional problems than are children of older mothers (Hofferth, 1987; Elster, McAnarney, & Lamb, 1983; Newberger, 1980). Further, some have suggested (Bolton, Laner, & Kane, 1980; de Lissovoy, 1973) that children of adolescent parents may be at greater risk for abuse and neglect than children born to older mothers.

The existing research on the consequences of early childbearing suggest that adolescent mothers are at greater risk of social and economic disadvantage throughout their lives than are adult mothers. "They are less likely to complete their education, to be employed, to earn high wages,

and to be happily married; and they are more likely to have larger families and to receive welfare" (Hayes, 1987, p. 138). Despite their poor prospects, though, many young mothers do adapt to their circumstances over the long term and find routes to social and economic recovery (Furstenberg, Brooks-Gunn & Morgan, 1987).

Given the national concern regarding the enduring effects of adolescent childbearing, an increasing amount of research has focused on the factors which place adolescent mothers and their children at risk for a variety of developmentally related problems. Several investigators have begun to describe the parenting of adolescent mothers, questioning their ability to provide for their children in a way that promotes optimal child development. The present review of studies will focus on several cognitive determinants of parenting, specifically, mothers' knowledge of child development and perception of competence in managing and nurturing a child. An additional cognitive component which has been neglected in previous research on adolescent parenting, but seems relevant, is the mothers' level of cognitive development, especially problem-solving ability. Each of these cognitive components appear to be important for effective, responsible parenting.

Knowledge of Child Development

Evidence suggests that unrealistic parental expectations concerning children's normative developmental abilities may

result in ineffective parenting and adverse consequences for children. Parental knowledge of children's normative development has been found to be inversely related to punitive child rearing practices (Johnson, Loxterkamp, & Albanese, 1982), and positively related to parenting skills such as mothers' responsivity to children (Stevens, 1984).

Elster and colleagues (1983) propose that knowledge of child development may directly affect parental sensitivity by influencing the mother's perception, interpretation, and responsiveness to infant cues. They suggest that the more knowledgeable a mother is about normal infant development and behavior, the more likely she is to interpret the baby's cues correctly and to implement appropriate responses. In addition, the mother's knowledge may affect her child rearing attitudes as well as the perceived stressfulness of the parenting role. Therefore, it appears that parental knowledge of normative child development is an important determinant of effective parenting.

Adolescent parents may be less well prepared for parenting than older parents, as assessed by their knowledge of norms for infant development. De Lissovoy (1973), in a study of teenage parents, assessed both maternal and paternal knowledge of motor, language, and social developmental norms and found that both parents had unrealistic developmental expectations of their infants. Teenage parents expected such accomplishments as sitting up, standing, first step, and

first word to occur much earlier than can be realistically expected. However, this study should be interpreted with caution because it included a restricted sample of the rural working class and lacked a non-adolescent comparison group.

Epstein (1980) confirmed that teenagers' knowledge of infant development in some areas is deficient. In contrast to the earlier work of de Lissovoy (1973), the adolescent females in this sample had more accurate knowledge of infant perceptual and motor development, health and nutrition, and basic care, but were lacking in their knowledge of cognitive, social, and language development. In contrast to previous studies, these mothers expected too little of their infants. However, this study also included no adult comparison group and, therefore, it is not clear whether or not the degree of error is greater for adolescent than for nonadolescent parents.

Additional studies have included adults in their design. Field, Widmayer, Stringer, and Ignatoff (1980) found that adult mothers had more realistic expectations regarding developmental milestones than teenage mothers. The teenage mothers were more likely to overestimate the capabilities of their infants; that is, they expected infant abilities to appear too early. However, differences in parity and marital status across the two groups make interpretation difficult. Other studies comparing adolescent mothers (or pregnant adolescents) with adult mothers on their knowledge of infant

abilities have continued to find that adolescent mothers lack general knowledge of certain developmental milestones (Roosa, 1983; Gullo, 1985, 1988; Reis, 1989). These studies disagree, however, over whether the teenage mothers expect infant abilities to appear too soon or too late, and in which area of infant abilities (motor, cognitive, language, social) unrealistic expectations are greatest. They also do not explore possible differences in knowledge of child development between younger and older adolescent mothers.

Perceived Parental Competence

Maternal attitudes are thought to play an important role in the developing mother-child relationship and, therefore, in the child's development (Roosa, et al., 1982). Several studies have investigated the child rearing attitudes of adolescent mothers and/or fathers. De Lissovoy (1973) found teenage parents to be impatient and intolerant with their children, and to have restrictive, less desirable, and punitive child rearing attitudes. Other researchers have also reported young mothers to have less desirable (more punitive) child rearing attitudes (Field, et al., 1980; Reis, 1989). However, some researchers have found there to be no differences in parenting or child rearing attitudes between teenage and adult mothers (Roosa, et al., 1982; Roosa, 1983; Schilmoeller & Baranowski, 1985).

One set of attitudes that has not received attention with adolescent mothers is that associated with parental

self-esteem and competence. Parenting self-esteem encompasses both perceived self-efficacy as a parent and the satisfaction derived from parenting. The self-efficacy literature suggests that higher self-efficacy or confidence improves performance. Bandura (1982) defined self-efficacy as expectations for successful coping in upcoming situations. In the parenting context, this refers to the degree to which the parent feels competent and confident in handling child problems.

Higher perceived sense of parental competence has been associated with perceived difficulty of the baby, social support, and measures of parental well-being (Gibaud-Wallston & Wandersman, 1978). Mash, Johnston, and Kovitz (1983) found that abusive mothers reported lower scores on a measure of perceived sense of parental competence than those reported by nonabusive mothers. In a more recent study, Teti and Gelfand (1991) found that maternal self-efficacy beliefs are related significantly to maternal behavioral competence, perceptions of infant difficulty, social-marital supports, and maternal depression. Perceived parental competence has also been found to be positively related to several aspects of problem-solving ability in adult mothers (Finley, 1990).

No previous studies have investigated the perceived parental self-esteem and competence in adolescent mothers. However, with regard to general self-esteem and personal efficacy (i.e., not relating to parenting competence

specifically), teenage mothers have been found to have lower feelings of both personal esteem and personal efficacy than nonteenage mothers or childless women (McLauglin & Micklin, 1983; Thompson, 1984). McLauglin and Micklin (1983) report that there is evidence that higher personal efficacy is associated with increasing age; therefore, teenage mothers, in comparison to adult mothers, are expected to have lower levels of personal efficacy. Pregnant and parenting teens have also been found to have poorer self-concepts in comparison to standardized norms (Zongker, 1977; Patten, 1981; Thompson, 1984). Streetman (1987), however, found no significant differences in self-esteem between adolescent mothers and nonmothers.

Parental attitudes toward their sense of competence and self-esteem appear to be especially important in adolescent mothers because their own development is associated with changes in self-concept and self-esteem. Thompson (1984) notes that "lower self-esteem and lack of feelings of control over one's circumstances inhibit good parenting, especially when combined with immaturity and social inadequacy" (p. 464). As young mothers develop autonomy in decision-making their perception of competence may become increasingly essential to the well-being of their children.

Cognitive Development and Problem-Solving Ability

A developmental perspective is necessary in order to study adolescent parenting. There are a variety of social,

emotional, and cognitive limitations which may curtail the adolescent's ability to parent. Few studies have taken the adolescent parents' development into account. Larsen and Juhasz (1985) assessed knowledge of child development, parenting attitudes, and social-emotional maturity of college and high school students. Their results indicated that negative parenting attitudes correlated with lack of knowledge of child development and limited personal social-emotional development, e.g., immature, self-centered, undependable. Although they did not study adolescent parents, Larsen and Juhasz realized the importance of considering the individuals' social-emotional developmental status.

Adolescents may be limited in their cognitive preparation for parenthood. In Piaget's view (Inhelder & Piaget, 1958), the final stage of cognitive development is formal operations, which begins after age 11 or 12 and is completed by late adolescence. Children in the formal operational stage can generate many solutions to a problem, think about each one hypothetically, anticipate their consequences, and weigh each factor in reaching a conclusion. However, it needs to be emphasized that 1) there are very large individual differences in how quickly these transitions take place; 2) the process is a gradual one which continues across adolescence into adulthood (Keating, 1980); and 3) adolescents or even adults often fail to employ formal

operational thinking nor do they apply their highest levels of thinking to all problem areas. In the present context, it is likely that among adolescents, there will be great variability in their cognitive abilities to manage the planning and problem solving associated with effective parenting. All of these skills are likely to benefit from experience, but adolescent parents are thrust into a parental role before they have had much experience solving complex social problems. It seems reasonable to suggest that parents must acquire the cognitive ability to accept and perform the parenting role before they can evince the sensitive responsiveness that facilitates optimal child development. It is also likely that the relative cognitive immaturity of adolescent parents inhibits or retards the development of realistic expectations and attitudes regarding child rearing (Elster, et al., 1983).

Although not focusing on adolescent parenting specifically, the study of parental social cognition is receiving much attention. Among these studies are those investigating parents' conceptions or thinking about child development (Newberger, 1980; Sameroff & Feil, 1985). Structured interviews and vignettes have been used to elicit parents' beliefs about the causes of child behavior. Both Newberger (1980) and Sameroff and Feil (1985) have found that such beliefs can be organized into levels of thought (ranging from having a very egoistic to an interactional orientation)

differing in the complexity, abstractness, and flexibility of reasoning. Furthermore, Sigel (1985) suggests that parents use their belief systems to evaluate their child's responses and to select their next behaviors.

Several researchers believe that parenting behaviors are strongly cognitively mediated (Holden & Ritchie, 1988; Bacon & Ashmore, 1986; Elias & Ubriaco, 1986). Bacon and Ashmore (1986) emphasize that parents are information-processing organisms. They describe several cognitive processes which they believe are crucial in determining adults' responses to observed child behavior: attention, unitization, categorization, integration, and decision-making. Holden and Ritchie (1988) emphasize that the tasks of rearing children often involve the use of the dialectical process to solve problems. They state that "parents are intelligent by making the appropriate decision or arriving at the proper synthesis of the thesis and antitheses under the specific circumstances and then implementing that decision in a suitable fashion" (p. 46). Specific cognitive components required for intelligent acts include differential weighing of factors involved and an awareness of as well as ability to use various strategies or plans of action. As mentioned previously, the adolescent is still working on developing skills to solve problems, resolve conflicts, and make decisions effectively.

The ability to solve interpersonal problems appears to

be an important component of effective parenting. Shure and Spivack (1978) found that students whose parents had learned how to teach their children social problem solving skills had higher IQs than students whose parents had not learned the problem solving approach. Research on parental problem-solving ability has also been conducted in comparing maltreating and comparison mothers. Maltreating mothers have been shown to have significantly greater unrealistic expectations and poorer problem-solving skills than normal mothers (Azar, Robinson, Hekimian, & Twentyman, 1984). Also, Shorkey, McRoy, and Armendariz (1985) have found that parents with attitudes typically associated with successful problem-solving were found to use less intense punishment with their children.

There is limited research that has specifically investigated the relationship between cognitive abilities and adolescent parenting. Only one study was found that addressed this issue. Panzarine (1989) investigated interpersonal problem-solving and its relation to adolescent mothering behaviors. She found that higher means-end problem-solving scores (indicating greater problem-solving skills) were significantly correlated with more optimal maternal interactions. Interpretations from this study are limited, though, because of the failure to employ a comparison group of adult mothers and because the problems addressed did not specifically pertain to child rearing

issues.

Mother-Child Interactions

Researchers have investigated the characteristics of adolescent mother-child interactions to determine whether adolescent mothers evince unique characteristics. Observations of adolescent mothers engaged in routine caregiving situations present a consistent pattern of interaction style with infants; when compared with older mothers, adolescent mothers generally show less desirable behavior in their interactions with their infants. Adolescent mothers tend to use nonverbal, physical interaction patterns with their infants, while older mothers tend to verbalize more to their infants (Epstein, 1980; Roosa, et al., 1982; Schilmoeller & Baranowski, 1985).

Jones, Green, and Krauss (1980) studied responsiveness in primiparous mothers and found that 21- to 23- year-old mothers were significantly more responsive to their newborn infants than were the 17- to 18-year-old mothers. Ragozin and her associates (Ragozin, Basham, Crnic, Greenberg, & Robinson, 1982) also reported that maternal age had a significant effect on the quality of parental behavior; the younger the mother, the less adequate was her observed behavior. In both of these studies, the differences associated with maternal age were evident despite controls for various demographic variables, including socioeconomic status, race, and marital status.

Other researchers have found that the younger the mother, the less she demonstrated behaviors such as synchronous movements and appropriate touching. Some adolescent mothers have been reported to engage in aggressive, inappropriate behaviors, such as picking, poking, and pinching their infants; behaviors which are rarely displayed by adult mothers (Lawrence, McAnarney, Aten, Iler, Baldwin, & Baldwin, 1981).

In a more recent study, Culp, Culp, Osofsky, and Osofsky (1991) examined adolescent mother-infant interaction patterns during feeding and play episodes. They found that, during feeding, the adolescent mothers showed fewer vocalizations, less expressiveness, less positive attitude, and less delight than non-adolescent mothers. During play, the adolescent mothers demonstrated less inventiveness, less patience, and less positive attitude than non-adolescent mothers.

Overall, there is evidence suggesting that adolescent mothers tend to engage in behaviors that are likely to foster suboptimal socioemotional and cognitive development. Together, these studies suggest that adolescent mothers provide more intrusive and less sensitively responsive parenting than adult mothers. Unrealistic expectations of infant abilities and low feelings of self-esteem and maternal competence, as well as the adolescent mothers' self-centeredness and cognitive immaturity, may be responsible for the qualitative differences observed between adolescent and

adult parent-child interactions, in comparison to adult parent-child interactions. An examination of potential differences among adolescent and adult mothers on measures of knowledge of child development, maternal competence, and problem-solving ability may provide useful information for future studies investigating the interaction patterns of adolescent mothers and their infants.

Statement of Questions and Hypotheses

Limitations of past research (i.e., failure to include comparison group of adult mothers, failure to consider mothers' cognitive developmental status, failure to separate young and older adolescents) and limited research on the relationships between the various cognitive components of effective parenting clearly indicate that this area deserves to be further examined.

The purposes of this study are to examine the relationships among several cognitive components of effective parenting and to compare young adolescent, older adolescent, and young adult mothers on these cognitive factors. The cognitive factors to be investigated include knowledge of child development, perceived parental competence, and problem-solving ability. The following questions will be investigated in the present study:

1. Do young adolescent, older adolescent, and adult mothers differ on overall knowledge of child

development? More specifically, do they differ on their knowledge of infant motor, personal-social, cognitive, and language abilities? Do they differ on their knowledge of first-year and second-year infant abilities? If mothers do have unrealistic expectations of development, do they underestimate (expect behaviors to appear later than appropriate) or overestimate (expect behaviors to appear earlier than appropriate) normal development?

2. Do the three groups of mothers differ on their level of perceived parental competence?

3. Do the three groups of mothers differ on problem-solving ability?

4. What are the correlative relationships between knowledge of child development, perceived parenting competence, and problem-solving ability?

It is expected that young adolescent, older adolescent, and young adult mothers will significantly differ on these cognitive components of parenting. The young adolescent mother is expected to have the least knowledge of normative child development, especially for infants' cognitive and social behaviors and for second-year infant abilities.

Whether they will overestimate or underestimate normative development is not known. It is likely that overestimation or underestimation will differ depending on the area of infant behavior (i.e., motor, language, cognitive, social).

Adolescence marks a period of great cognitive advances for the individual. With this stage of cognitive development come the abilities to foresee long-term consequences and to plan for the future; such issues bear directly on teenage parenting ability. It is expected that the younger the mother, the less cognitively mature she will be and, therefore, the poorer her ability to solve problems. Also, it is expected that the younger the mother, the lower her perceptions of parental competence.

The various cognitive components are expected to correlate significantly with one another. Mothers with greater knowledge of child development are expected to have better problem-solving abilities and higher perceptions of parental competence.

CHAPTER II

METHODOLOGY

Subjects

The final sample for this study consisted of 34 mothers ranging in age from 15 to 27 years old. Data were obtained from an additional participant, but are not included in the analyses because it was later determined that the participant misrepresented herself as a mother. The mothers who participated in the study were recruited for voluntary participation from two locations in Evanston, Illinois: Family Focus and Baby Toddler Nursery.

The breakdown of the sample according to age was as follows: 11 young adolescent mothers (14 to 17 years), 14 older adolescent mothers (18 to 19 years), and 9 adult mothers (20 years or older). Thirty-one of the 34 mothers were African-American; of the remainder, one mother was Hispanic, one Caucasian, and one both African-American and Caucasian. Ninety-four percent (n = 32) were single; one mother was married and one separated. Thirty-eight percent (n = 13) were employed and 53% (n = 18) were in school. The mean education level of the sample was 11.6 years.

Although the study was to include only primiparous adolescent and adult mothers, multiparous mothers were later

included to increase the sample size. Seventy-six percent (n = 26) of the mothers were primiparous, 15% (n = 5) had two children, and 9% (n = 3) had three or more children (maximum of 7). Children ranged in age from 13 days to 9 years. Seventy-six percent (n = 26) of the mothers had at least one child under the age of 12 months, a total of 88% (n = 30) had at least one child 2 years of age or younger, and all (n = 34) mothers had at least one child 3 years of age or younger.

Fifty-six percent (n = 19) of mothers and their children lived with their parent(s) (i.e., grandparents of the children), 18% (n = 6) lived alone with their children, 9% (n = 3) lived with family members other than their parent(s), 9% (n = 3) lived with their boyfriends, 6% (n = 2) lived with both their boyfriends and their parent(s), and 3% (n = 1) lived with friends. The number of individuals in the household ranged from 2 to 9 (Mean = 5.18, SD = 1.84).

The modal household income category reported by the participants responding to this question was $20,000 -$30,000 per year (32% of sample). Twenty-nine percent had a household income of $10,000 - $20,000 per year, 15% reported an income of under $10,000 per year, 12% reported having a household income greater than $30,000, and 12% of the sample did not provide a response. Mothers reported receiving from $0 to $367 per week for themselves and their child (children) (Mean = $127.62, SD = 100.77, Median = 125.50, with n = 29).

Demographic characteristics broken down by mothers' age

group are provided in Table 1. The three groups of mothers were found to differ significantly in age at first birth [$F(2,31) = 15.874$, $p < .0001$]. The young teen mothers were younger than the older teen and adult mothers when they had their first child. The adult mothers were more likely to have more children (Cramer's $V = .483$, $X^2(8) = 15.85$, $p < .05$). The mean ages of the oldest child and youngest child were also found to differ among the three groups [$F(2,31) = 20.575$, $p < .0001$ and $F(2,31) = 5.061$, $p < .05$, respectively]. The ages of the oldest child and the youngest child of the adult mothers were significantly greater than those for the younger and older adolescent mothers.

The youngest mothers were more likely to be enrolled in school (Cramer's $V = .406$, $X^2(2) = 5.61$, $p < .10$) and had a mean educational level approximately two years below that of the other mothers. In addition, the three groups of mothers differed significantly in the number of people living in their household and on the number of younger siblings [$F(2,31) = 7.072$, $p < .01$ and $F(2,31) = 3.312$, $p < .05$, respectively]. The youngest mothers had a greater number of younger siblings and had significantly more people living in their homes.

TABLE 1

Demographic Characteristics of the Three Groups of Mothers

	Young Teen (n = 11)	Older Teen (n = 14)	Adult (n = 9)
Mean AGE	16.09 (.83)	18.29 (.47)	22.67 (2.74)***
Mean AGE AT FIRST BIRTH	15.36 (1.03)	17.79 (.80)	18.11 (1.90)***
RACE (%)			
Black	90.9	92.9	88.9
Caucasian	9.1	0.0	0.0
Hispanic	0.0	0.0	11.1
Black/Caucasian	0.0	7.1	0.0
MARITAL STATUS (%)			
Single	90.9	92.9	100.0
Married	0.0	7.1	0.0
Separated	9.1	0.0	0.0
% EMPLOYED	27.3	35.7	55.6
% IN SCHOOL	81.8	35.7	44.4+
Mean GRADE (yrs)	10.18 (.87)	12.00 (.00)	12.78 (1.20)***
Number of Children (%)			
1	81.8	100.0	33.3
2	18.2	0.0	33.3
3	0.0	0.0	11.1
4	0.0	0.0	11.1
7	0.0	0.0	11.1++
Mean AGE OF OLDEST CHILD (months)	9.38 (7.95)	6.96 (6.43)	51.56 (32.22)***
Mean AGE OF YOUNGEST CHILD	6.47 (4.12)	6.96 (6.43)	17.56 (14.43)*

(continued)

TABLE 1 -- Continued

	Young Teen (n = 11)	Older Teen (n = 14)	Adult (n = 9)
Mean NUMBER OF YOUNGER SIBLINGS	2.36 (1.43)	0.77 (1.17)	1.63 (2.07)*
Mean NUMBER OF PEOPLE IN HOUSEHOLD	6.27 (1.62)	4.00 (1.04)	5.67 (2.12)**
MOTHERS' LIVING ARRANGEMENTS (%)			
Alone	0.0	14.3	44.4
With Parent(s)	63.6	50.0	55.6
With Family (Not Parents)	9.1	14.3	0.0
With Parent(s) & Boyfriend	18.2	0.0	0.0
With Boyfriend (or Husband)	9.1	14.3	0.0
With Friends	0.0	7.1	0.0
ANNUAL HOUSEHOLD INCOME (%)			
$ 0-10,000	10.0	18.2	22.2
$ 10-20,000	40.0	18.2	44.4
$ 20-30,000	40.0	45.5	22.2
> $ 30,000	10.0	18.2	11.1

NOTE: SD's in parentheses

* $p < .05$, ** $p < .01$, *** $p < .0001$

+ Cramer's $V = .406$, $X^2(2) = 5.61$, $p < .10$

++ Cramer's $V = .483$, $X^2(8) = 15.85$, $p < .05$

Instruments

Participants completed three measures: 1) the infant development questionnaire (IDQ; Granger, 1982), a measure of knowledge of infant development; 2) The Parenting Sense of Competence Scale (PSOC; Gibaud-Wallston & Wandersman, 1978), a measure of perceived parental competence; and 3) The Stories Told to Pictures (Heath, 1990), a measure of problem-solving ability in parenting situations. Mothers were also asked to complete a background information sheet.

Knowledge of Child Development. In order to assess mothers' knowledge of infant development, participants completed a questionnaire adapted from Granger (1982). The Infant Development Questionnaire (IDQ) contains items dealing with the following developmental areas or domains of infant behaviors: a) motor (e.g., At what age are most babies first able to lift their head from time to time when being held upright?); b) language (e.g., At what age do most babies begin to babble using two-syllable sounds?); c) cognitive (e.g., At what age do most babies begin to look briefly at bright colored objects?); and d) personal-social (e.g., At what age do most babies begin to act differently with strangers than with parents?).

The measure contains 56 items; 14 items from each of these domains are represented in the questionnaire, 7 each of behavior characteristic of infants 0 to 12 months and of infants 13 to 24 months. After the items, the numbers 1

through 24 are listed. The respondents are asked to circle the number that corresponds to the month that they believe babies are first able to do the behaviors described in the item. The questionnaire was modified for use in this study. Thirty-two of the original 56 items were used; 8 from each of the 4 infant domains. The shortened version of the IDQ appears in the Appendix.

Scoring is achieved by determining the number of months the subject deviates from the normative score for each item and computing a mean absolute error score for overall knowledge of infant development, a mean absolute error score for each of the four developmental domains, and a mean absolute error score for first-year and second-year items. This permits the determination of whether subjects' expectations regarding the time of emergence of infant abilities are accurate. In order to determine whether mothers were more likely to overestimate or underestimate infant abilities, the number of items for which the respondent expected infant abilities to occur earlier and the number of items for which the respondent expected infant abilities to occur later than the normative score were determined.

For the original measure, split-half reliabilities are reported as .59, .69, .78, and .67 for the motor, cognitive, personal-social, and language domains, respectively (Granger, 1982). The Infant Development Questionnaire was used in a

preliminary study which included 77 college students. The shortened version of the Infant Development Questionnaire was examined to ascertain whether it evidenced sufficient internal reliability. The overall internal consistency (Cronbach's alpha) for the shortened questionnaire was .658. Alpha levels for the four developmental subscales were low to moderate: Cognitive, .128; Motor, .242; Language, .383; and Personal-Social, .488. Higher alpha levels were obtained for the First and Second Year subscales, .817 and .515 respectively.

Perceived Parental Competence. The Parenting Sense of Competence Scale (PSOC; Gibaud-Wallston & Wandersman, 1978) was used to obtain a measure of self-esteem in the parenting situation. The PSOC is a seventeen item scale which is divided into two subscales. The first, Skill/Knowledge, assesses parents' perceptions of the degree to which they have acquired the skills and understanding to be a good parent. The second, Value/Comfort, assesses the degree to which the individual values parenthood and is comfortable in that role.

An adapted version of the PSOC (Finley, 1990) was used for this study. The modified version eliminates the doublebind questions and contains 16 items. Each item is answered on a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). Higher scores indicate greater self-esteem or perceived competence.

Reliability for the revised version of the PSOC was high. Alpha coefficients are reported as .90, .82 and .85 for the total measure, the Skill/Knowledge Scale, and the Value/Comfort Scale, respectively (Finley, 1990). The revised version of the PSOC appears in the Appendix.

Problem-Solving Ability. The Stories Told To Pictures (Heath, 1990) was used to assess mothers' problem-solving skills. The instrument was designed to assess the effectiveness of the Learning About Parenting: Learning to Care curriculum; a curriculum directed at children which aims to support specific attitudes and to teach relevant skills and information related to parenting. The instrument measures the ability to generate stories about parent-child interactions that reflect developmentally and effective parent-child outcomes. The Stories Told To Pictures is an interview instrument which consists of a series of 5 photographs of infants and toddlers in different situations and takes about 20 minutes to complete. Subjects are asked individually to tell for each picture: (1) What they see in the picture? (2) What happened just before the picture was taken? (3) What will happen next? (4) What are all the different ways a parent might handle the situation? and (5) What would they do and why?

Four scores are computed on each of the five stories generated from the pictures: (1) Detail of Observation; (2) Understanding of the Adult Role; (3) Ability to Brainstorm

Alternatives; and (4) Adequacy of Subjects' Choice of Method for Handling the Situation. Corresponding scores are summed across the five pictures to arrive at overall scores for each subscale.

Preliminary analyses demonstrate that stories can be obtained from an inner city population of children in grades 6 and 7. Since the Stories Told to Pictures is a new measure, no definitive information regarding its validity and reliability is as yet available. However, it does appear to have face validity (Heath, 1990). Students have been able to relate stories about parent-child interactions and to generate alternative solutions to the situations presented in the pictures.

Background Information Sheet. In addition to completing the above instruments, participants were asked to complete a background information sheet which was designed to obtain information on demographic variables and on experiences related to children and child development knowledge. Information on age, race, marital status, education, living arrangements, employment status, annual income, and child's age was collected. Subjects were also asked about experiences with children. They were asked if they had babysat regularly, if they had helped to care for younger siblings, if they had participated in a childbirth education class, and if they had completed coursework in child development. The background information sheet appears in the

Appendix.

Procedures

Two community services in Evanston, Illinois were contacted in person by the investigator and by one member of her thesis committee: Family Focus (Our Place), a family community center which serves as a drop-in center for adolescents (including pregnant and parenting teens), and Baby Toddler Nursery, a day nursery for infants under age three. The nature of the study was explained to the program directors, and the investigator requested permission to recruit mothers enrolled in their programs and to collect data on their premises. Program directors provided the investigator with a list of mothers who were interested in participating. Potential subjects were contacted by phone and also were approached directly on the premises by the investigator and asked to participate in the study.

Mothers were informed of the general nature of the study, the procedures to be followed, and the time commitment involved. Confidentiality of the data to be provided was assured and inquiries regarding the general research proceedings were addressed. Before beginning, subjects read and signed a general consent form. Parental permission was also obtained for those mothers that were under 18 years of age.

Data collection was conducted at the location from which the participant was recruited. Mothers were first

interviewed individually to complete the problem-solving instrument, The Stories Told To Pictures. After completion of the problem-solving instrument, the mothers completed the paper and pencil measures, either individually or in small groups. The mothers completed the adapted Parental Sense of Competence Scale followed by the adapted Infant Development Questionnaire and the background information sheet. This order was determined to be most appropriate, allowing for the least transfer of information. The investigator explained the instructions for each instrument and read each item to the subjects directly.

Following administration of the measures, any questions were addressed, and the nature of the study was explained. Before leaving, each subject was presented a written description of the project and was encouraged to contact the investigator if she had any questions or wished to learn more about the study. In return for the mothers' participation, the investigator paid the mothers $5.00 after they had completed the problem-solving interview. They also received a small toy for their child after completing the written questionnaires. Refreshments were also provided for the mothers and their children.

CHAPTER III

RESULTS

Preliminary Analyses

Before the specific hypotheses of the study were tested, the young teen, older teen, and adult mothers were compared on their direct experiences with children and on their completion of courses which contained information on child development. Table 2 compares the three groups of mothers on their child rearing experiences and on their completion of child-related coursework.

As indicated previously, the adult mothers were more likely to have more than one child; sixty-seven percent of adult mothers and 18% of younger teen mothers had more than one child whereas none of the older teen mothers had more than one child. Sixty-four percent of young teen mothers helped care for their siblings whereas only 21% of older teen mothers and 44% of adult mothers did so. Also, a greater percentage of young teen mothers babysat regularly, 73% compared to 57% for older teen mothers and 56% for adult mothers.

The youngest mothers had also completed more child-related courses. Seventy-three percent of young teen mothers had completed a childbirth education class, whereas

TABLE 2

Child Rearing Experiences and Child Related Coursework of the Three Groups of Mothers

	Young Teen (n = 11)	Older Teen (n = 14)	Adult (n = 9)
% MULTIPAROUS	18.2	0.0	66.7 **
% HELPED CARE FOR SIBLINGS	63.6	21.4	44.4
% BABYSAT REGULARLY	72.7	57.1	55.6
% TOOK CHILDBIRTH EDUCATION CLASS	72.7	42.9	44.4
% TOOK CHILD DEVELOPMENT CLASS	81.8	71.4	22.2 *
Mean EXPERIENCE SCORE	2.909 (1.300)	1.929 (0.997)	2.333 + (0.707)

SD's in parentheses.

NOTE: The Experience Score was calculated by summing yes/no responses about experience and child related coursework (multiparous, helped care for siblings, babysat regularly, took childbirth education class, and took child development class). Values can range from 0 to 5.

* Cramer's V = .497, $X^2(2)$ = 8.39, p < .05

** Cramer's V = .637, $X^2(2)$ = 13.79, p < .001

+ $F(2,31)$ = 2.715, p < .10

only 43% of older teen mothers and 44% of adult teen mothers had participated in childbirth education classes. In addition, 82% of the young teen mothers and 72% of the older teen mothers had completed a child development class; only 22% of the adult mothers had done so.

A composite variable was created to reflect the mothers' direct experience with children and completion of courses which contained information on child development. An Experience Score was calculated by summing yes/no responses about the following types of experience and child related coursework: multiparous, helped care for siblings, babysat regularly, took childbirth education class, and took child development class. Scores on the composite could range from 0 to 5. The mean Experience Score was found to be 2.9 for the young teen mothers, 1.9 for the older teen mothers and 2.3 for the adult mothers. A one-way analysis of variance revealed that there was a marginally significant difference between the three groups' mean scores [$F(2,31) = 2.72$, $p < .10$]. The youngest mothers seem to have the most experience and the older teen mothers seem to have the least experience with child rearing and child related coursework.

The potential influences of experience and other demographic variables (i.e., mother's age at first birth, number of children, age of oldest and youngest child, and number of younger siblings) on knowledge of child development, perceived parental competence, and problem-

solving ability were investigated.

Pearson correlation coefficients between the composite variable Experience Score and the dependent variables knowledge of child development, perceived parental competence, and problem-solving ability were examined for potential relationships. Experience was not correlated significantly with knowledge of child development or perceived parental competence. However, experience correlated significantly with one of the four problem-solving subscales, Adequacy of Method Chosen (r = .36, p < .05). Mothers with greater experience demonstrated more competency in deciding upon appropriate actions; that is, they were more likely to choose a more appropriate method for handling the parenting situation presented in pictures.

Mother's age at first birth was found to be significantly correlated with the Alternatives subscale of the problem-solving measure (r = .422, p < .05) and the Total Scale, the Skills/Knowledge subscale, and the Value/Comfort subscale of the measure of perceived parental competence (r = -.509, p < .01, r = -.417, p < .05, and r = -.429, p < .05, for the Total Scale, Skills/Knowledge subscale, and the Value/Comfort subscale, respectively).

In addition, number of children was significantly correlated with the Skills/Knowledge subscale of the perceived parenting competence measure (r = .396, p < .05); mothers with more children perceived themselves as having

more parenting knowledge. Also, number of younger siblings was found to be correlated significantly with the Value/Comfort subscale of the perceived parenting competence measure (r = .463, p < .01); mothers with more younger siblings reported greater value associated with the parenting role. No significant relationships were found between age of youngest child or age of oldest child and knowledge of child development, perceived parental competence, or problem-solving ability.

Knowledge of Infant Development

Analyses of variance were performed in order to determine if there were any differences between the three groups of mothers on their overall knowledge of infant development, on their knowledge of specific developmental areas (cognitive, motor, language, and personal-social), and on their knowledge of first year and second year behaviors.

The means and standard deviations computed from the absolute value of error scores for each of the developmental areas and for overall knowledge of infant development (all items) are presented in Table 3. As Table 3 indicates, mean error scores based on the absolute value of item error scores ranged from approximately 3 to 5 months.

A 3(mothers' group) by 4(developmental area) analysis of variance with repeated measures on the second factor was performed on the error scores. No main effect for mothers' group was found [$F(2,31)$ = .26, p > .05]; that is, the three

TABLE 3

Means and Standard Deviations based upon the Absolute Values of Error Scores on the Infant Development Questionnaire for Young Teen, Older Teen, and Adult Mothers

	YOUNG TEEN < 17	OLDER TEEN 18-19	ADULT 20+	ALL
	n=11	n=14	n=9	N=34
MOTOR ITEMS	3.364 (0.767)	3.232 (0.939)	3.472 (0.602)	3.338 (0.790)
COGNITIVE ITEMS	5.102 (1.199)	4.616 (1.191)	4.264 (0.754)	4.680 (1.114)
LANGUAGE ITEMS	4.023 (1.027)	3.607 (0.820)	3.542 (1.021)	3.724 (0.939)
PERS/SOCIAL ITEMS	3.591 (1.199)	3.848 (0.880)	4.431 (0.929)	3.919 (1.029)
TOTAL ITEMS	4.020 (0.734)	3.815 (0.651)	3.934 (0.645)	3.913 (0.663)

SD's in parentheses

Note: Error scores are reported in months.

groups of mothers did not differ on their overall knowledge of infant abilities. However, there was a significant main effect for developmental area, $F(3,93) = 15.29$, $p < .0001$. Cognitive items received the largest error scores (Mean = 4.68) followed by Personal-Social items (Mean = 3.92), Language items (Mean = 3.72), and Motor (Mean = 3.34) items. Pairwise comparisons between developmental areas using the Scheffe test revealed that the error scores for the Cognitive items were significantly different from the error scores for each of the other areas, Personal-Social, Language, and Motor. In addition, the error scores for the Personal-Social area were significantly different from the error scores for the Motor domain. No other pairwise comparisons were significant.

The interaction between mothers' age group and developmental area was found to be approaching significance, $F(6,93) = 2.06$, $p < .10$. It appears that for the motor items the error scores for three groups of mothers are about equal, for the cognitive and language areas the young teen mothers have the highest error scores and the adult mothers have the lowest error scores, and for the personal-social items the pattern is reversed with adult mothers having the highest error scores and the young teen mothers having the lowest error scores. The error scores for the older teen mothers fall between those of the younger teen and adult mothers.

Table 4 presents means and standard deviations computed

from the absolute value of error scores for First Year Items (items with normative scores between 1 and 12 months) and Second Year Items (items with normative scores between 13 and 24 months) for each of the three groups of mothers. Mean error scores for first year items ranged from 2.7 to 3.5 months, and mean error scores for second year items ranged from 4.3 to 5.4 months.

A 3(mothers' group) by 2 (year of item) analysis of variance with repeated measures on the second factor revealed a significant main effect for year of item only [$F(1,31) = 51.95$, $p < .0001$]; there was no significant main effect for mothers' age group. There was also a significant interaction effect between mothers' group and year of item, $F(2,31) = 4.24$, $p < .05$. Tests of simple main effects indicated that the young teen mothers' and the older teen mothers' error scores for the second year items were greater than for the first year items [$F(1,31) = 39.39$ and 23.34, $p < .01$]. However, for the adult mothers, there was no significant difference found between the mean error scores for first year and second year items [$F(1,31) = 3.07$, $p > .05$).

In addition, the simple main effect of mothers' age group at each level of infant age was examined to determine whether the three groups of mothers differed on first year and second year items. A marginally significant difference between the three groups of mothers was found on the error scores for the second year items [$F(2,60) = 2.680$, $p < .10$]. The youngest

TABLE 4

Means and Standard Deviations based upon the Absolute Value of Error Scores on the Infant Development Questionnaire for First and Second Year Items for Young Teen, Older Teen, and Adult Mothers

	YOUNG TEEN < 17	OLDER TEEN 18-19	ADULT 20+	ALL
	n=11	n=14	n=9	N=34
FIRST YEAR	2.682 (0.741)	2.902 (0.575)	3.521 (0.991)	2.995 (0.804)
SECOND YEAR	5.358 (1.430)	4.728 (1.141)	4.347 (0.743)	4.831 (1.195)

SD's in parentheses

Note: Error scores are reported in months.

mothers tended to have the highest error scores, the adult mothers tended to have lowest error scores, and the error scores for the older teen mothers fell in between those of the other two groups. There was no difference between the three groups of mothers' error scores for the first year items, however.

In order to determine whether mothers were more likely to overestimate (expect behaviors to appear earlier than appropriate) or underestimate (expect behaviors to appear later than appropriate) infant abilities, the number of items for which the respondent expected infant abilities to occur earlier and the number of items for which the respondent expected infant abilities to occur later than the normative score were determined. The means and standard deviations for the number of late and early responses for the three groups of mothers are presented in Table 5.

A 3(mothers' group) by 2 (type of response) analysis of variance with repeated measures on the second factor revealed a significant interaction effect [$F(2,31) = 3.56$, $p < .05$], but no significant main effects for mothers' age group or type of response. Analyses of simple main effects indicated that there was a significant difference between the number of early responses and the number of late responses for the young teen mothers only [$F(1,31) = 6.15$, $p < .05$]. The young teen mothers were more likely to overestimate infant abilities (i.e., expect infant abilities to appear earlier

TABLE 5

Means and Standard Deviations for the Number of Late (+) and Early (-) Responses on the Infant Development Questionnaire for Young Teen, Older Teen, and Adult Mothers

	NO. OF LATE RESPONSES (+)	NO. OF EARLY RESPONSES (-)	RATIO EARLY/LATE
YOUNG TEEN	10.909 (4.549)	17.545 (4.762)	1.608
OLDER TEEN	14.000 (4.297)	15.429 (4.327)	1.102
ADULT	16.778 (4.868)	12.778 (4.324)	0.762

SD's in parentheses

Total items = 32

than the norm). Although there was not a significant difference between the number of late and early responses for the older teen mothers or for the adult mothers, the ratio of early to late responses is reversed for the adult mothers (Ratio = 1.6, 1.1, and .76, for young teen, older teen, and adult mothers respectively). The adult mothers appear more likely to underestimate infant abilities (i.e., expect infant abilities to appear later than the norm).

This pattern becomes more apparent when examining the simple main effect of mothers' age group at each level of type of response (i.e., number of late responses versus number of early responses). There was a significant difference between the groups on the mean number of late responses [$F(2,60) = 4.11$, $p < .05$]; adult mothers had a greater mean number of late responses than the young teen mothers (Mean = 16.78 and 10.9 respectively). For the number of early responses, there was only a marginally significant difference between the three groups [$F(2,60) = 2.69$, $p < .10$]; the young teen mothers had a higher number of early responses (Mean = 17.5, 15.4, and 12.8 for the young teen, older teen, and adult mothers respectively).

Table 6 presents the means and standard deviations for the number of late and early responses in the motor, cognitive, personal-social, and language domains for each of the groups. In order to determine if there were any differences among the three groups' number of early and late

TABLE 6

Means and Standard Deviations for the Number of Late (+) and Early (-) Responses for Each Developmental Area on the Infant Development Questionnaire for Young Teen, Older Teen, and Adult Mothers

	NO. OF LATE RESPONSES (+)	NO. OF EARLY RESPONSES (-)	RATIO EARLY/LATE
MOTOR ITEMS			
YOUNG TEEN	1.909 (1.136)	5.273 (1.348)	2.762
OLDER TEEN	2.643 (1.216)	4.643 (1.216)	1.757
ADULT	3.889 (1.965)	3.667 (1.658)	0.943
COGNITIVE ITEMS			
YOUNG TEEN	2.455 (1.508)	4.909 (1.136)	2.000
OLDER TEEN	3.214 (0.893)	4.071 (0.997)	1.267
ADULT	3.556 (1.236)	3.556 (1.130)	1.000
PERSONAL-SOCIAL ITEMS			
YOUNG TEEN	3.727 (1.902)	3.000 (2.145)	0.805
OLDER TEEN	4.786 (1.528)	2.786 (1.477)	0.582
ADULT	5.111 (1.054)	2.333 (1.414)	0.456
LANGUAGE ITEMS			
YOUNG TEEN	2.818 (1.537)	4.364 (1.748)	1.549
OLDER TEEN	3.357 (2.098)	3.929 (1.979)	1.170
ADULT	4.000 (1.500)	3.444 (1.667)	0.861

SD's in parentheses

Each developmental area contained 8 items.

responses a 3(mothers' group) by 2 (type of response) analysis of variance with repeated measures on the second factor was performed for each of the developmental areas.

For the motor domain, a significant main effect for type of response [$F(1,31) = 13.37$, $p < .001$] and a significant interaction effect [$F(2,31) = 4.44$, $p < .05$] were found. Analyses of simple main effects indicated that there were significant differences between the number of early and late responses for the young teen and older teen mothers only [$F(1,31) = 17.24$ and 7.76, $p < .01$]. Both groups of teen mothers were more likely to overestimate infants' motor abilities (i.e., expect them to occur earlier than the norm).

The analysis of variance for the cognitive domain also revealed a significant main effect for type of response (number of late versus number of early responses) [$F(1,31) = 8.35$, $p < .01$] and a significant interaction effect [$F(2,31) = 3.32$, $p < .05$]. Analyses of simple main effects indicated that the number of early and late responses differed significantly for the young teen mothers only [$F(1,31) = 13.87$, $p < .01$]; that is, the young teen mothers were more likely to overestimate infants' cognitive abilities (i.e., expect them to occur sooner than normative).

Analysis of the personal-social domain revealed a significant main effect for type of response [$F(1,31) = 10.75$, $p < .01$]; the interaction was found not to be significant. All three groups of mothers underestimated

infants' personal-social abilities; that is, they all expected these abilities to begin later than normal. Notice that the pattern of the ratio of early to late responses is opposite from those of the other domains; this is so because all three groups were more likely to underestimate infants' personal-social abilities.

Finally, analysis of the language domain revealed no significant main effects and no significant interaction effect. The ratios of the number of early to the number of late responses are 1.5, 1.2, and .86 for the young teen, older teen, and adult mothers respectively. Although not significant, the pattern for the language domain is similar to that found for the motor domain with both groups of teen mothers responding early to more items and the adult mothers responding late to more items.

Perceived Parental Competence

Perceived parental competence was measured by scores on the adapted Parenting Sense of Competence Scale (PSOC). The scale consists of two subscales: Skill/Knowledge Scale and Value/Comfort Scale. The Skill/Knowledge Scale assessed the degree to which the mother believes she possesses the skills needed to be a good parent. The Value/Comfort Scale assessed the degree to which the mother values parenting, that is, feels comfortable and satisfied with the maternal role.

Scoring for items 3, 6, 7, 8, 14, and 15 were reversed so that for all items, higher scores indicated greater self-

esteem or perceived competence. PSOC total scores were calculated by summing the items and dividing the sum by 16 (total items). Scores for the Skill/Knowledge Scale were calculated by summing items 1, 2, 3, 4, 9, 10, 11, 12, and 16 and dividing the sum by 9 to obtain a mean Skills/ Knowledge score for each subject. Similarly, scores for the Value/Comfort Scale were calculated by summing the remainder of the items and dividing the sum by 7 to obtain a mean Value/Comfort score for each subject.

In order to test the hypothesis that the youngest mothers would have the lowest perceived parenting competence, one-way analyses of variance were performed on the young adolescent mothers', older adolescent mothers', and adult mothers' scores on the PSOC and on each of the two subscales. Table 7 presents the means and standard deviations for the PSOC and the two subscales for the three groups of mothers.

A significant difference between the three groups of mothers was found on the PSOC total score [$F(2,31) = 6.215$, $p < .01$]. Follow-up analysis using the Scheffe test revealed that, for the total scale, the young adolescent mothers had greater self-esteem or perceived competence than the older adolescent mothers. There was also a significant difference between the three groups of mothers on the Value/Comfort subscale of the PSOC [$F(2,31) = 8.027$, $p < .01$]. Again, follow-up analysis using the Scheffe test showed that the young adolescent mothers' scores on the Value/Comfort

TABLE 7

Means and Standard Deviations for the Parenting Sense of Competence Scale for Young Teen, Older Teen, and Adult Mothers

	YOUNG TEEN < 17 n = 11	OLDER TEEN 18-19 n = 14	ADULT 20+ n = 9	F for Group effect
TOTAL PSOC SCORE	4.114 (0.406)	3.545 (0.416)	3.813 (0.367)	6.215*
VALUE/ COMFORT SCALE	4.351 (0.369)	3.612 (0.450)	3.937 (0.558)	8.027*
SKILL/ KNOWLEDGE SCALE	3.929 (0.510)	3.492 (0.542)	3.716 (0.586)	2.003

SD's in parentheses

Note: Values can range from 1 to 5
Higher scores indicate a greater sense of self esteem or perceived competence in parenting situations.

* $p < .01$ and the Scheffe procedure revealed that the younger teen mothers' scores differed significantly from those of the older teen mothers at the .05 level.

subscale were significantly higher than the scores of the older adolescent mothers, indicating that the younger mothers possessed more comfort and satisfaction in being parents. There was no overall difference between the three groups of mothers on the Skills/Knowledge subscale of the PSOC [$F(2,31) = 2.003$, $p > .05$].

For each group of mothers, a paired-samples t test was performed in order to determine if the scores on the Skills/Knowledge subscale and the Value/Comfort subscale differed significantly from each other. There was no significant difference between the subscale scores for the older adolescent mothers or for the adult mothers [$t(13) = .787$, and $t(8) = .745$, $p > .05$]. However, the young adolescent mothers scored significantly higher on the Value/Comfort subscale than on the Skills/Knowledge subscale of the PSOC scale [$t(10) = 3.420$, $p < .01$]. These results indicate that the young adolescent mothers perceived themselves as possessing greater competence in terms of values (comfort and satisfaction in being a mother) than in terms of skills and knowledge needed to be good mothers.

Problem-Solving Ability

Problem-solving ability was measured by scores on the Stories Told to Pictures. Four components of problem-solving were assessed: 1) Detail of Observation, a measure of observational skills; 2) Understanding of Adult Role, an indication of the importance of adult interaction and

intervention with infants; 3) Alternatives, a measure of the respondents' ability to generate alternative solutions to the situations presented in the photographs; and 4) Adequacy of Method Chosen, a measure of the respondents' competency in deciding upon appropriate actions.

Scoring of Detail of Observation was achieved by summing the number of people, objects, details, and actions described by the mothers for all 5 photographs. Scores for Understanding of Adult Role were obtained by employing the following rating scale: 0 = no adult intervention, 1 = adult intervened in a developmentally inappropriate manner (i.e., hitting, physically abusive), 3 = adult intervened in neutral manner (i.e., separating children, removing toy), 4 = adult intervention falls between 5 and 3, and 5 = adult intervened with consideration for the development of the infant. The ratings for each of the 5 photographs were summed (highest score possible = 25) to give one overall score for Understanding of Adult Role.

Scoring for Alternatives was achieved by summing the number of different ways mothers listed for handling the situation presented in each of the 5 photographs. And finally, for Adequacy of Method Chosen, scores were calculated by giving 1 point for each of the following: method age appropriate, aware of consequence relevant to situation, meeting infant's needs for protection and health, teaching infant (explaining), indicating awareness of

infant's needs to be loved, indicates awareness of individuality of child, and consequence beneficial to growth of child. A total score for this scale was obtained by summing the total number of points received for each of the 5 situations.

Responses to the pictures were scored by both the investigator and an undergraduate psychology major. Inter-rater reliability was determined by using the following conventional calculation:

$$\frac{\text{\# agreements}}{\text{\# agreements + \# disagreements}} \times 100.$$

Inter-rater reliabilities for each of the scales were as follows: Detail of Observation, 82%; Understanding of Adult Role, 93%; Alternatives, 87%; and Adequacy of Method Chosen, 45%. Disagreements in scores between the two raters were discussed and attempts were made to reach agreement on the final scores. When agreements could not be made, the final score was determined by averaging the scores of the two raters.

The means for the total sample for each of the scales were as follows: for Detail of Observation, Mean = 48.24 (SD = 14.28); for Understanding of Adult Role, Mean = 4.21 (SD = 3.03); for Alternatives, Mean = 16.06 (SD = 3.39); and for Adequacy of Method Chosen, Mean = 19.03 (SD = 2.50). On the average, the mothers made 10 observations per picture and listed 3 different ways of handling the situation depicted in

each picture. Scores for Understanding of Adult Role were quite low (Mean = 4.2; Range = 0 to 10) given that the highest possible score was 25. Scores for Adequacy of Method Chosen ranged from 13 to 25, with the highest possible score being 35. Table 8 presents the means and standard deviations for the four scales of the Stories Told to Pictures for each group of mothers.

Table 8 presents the means and standard deviations for the problem-solving scales for the young teen, older teen, and adult mothers. In order to test the hypothesis that the youngest mothers would have the poorest problem-solving abilities, one-way analyses of variance were performed on the young adolescent mothers', older adolescent mothers', and adult mothers' scores on each of the four components of problem-solving ability: detail of observation, understanding of adult role, alternatives, and adequacy of method chosen. The analyses revealed that there were no significant differences between the three groups of mothers on any of the four scales [Detail of Observation: $\underline{F}(2,31) = 1.195$, $\underline{p} > .05$; Understanding of Adult Role: $\underline{F}(2,31) = .212$, $\underline{p} > .05$; Alternatives: $\underline{F}(2,31) = 1.433$, $\underline{p} > .05$; and Adequacy of Method Chosen: $\underline{F}(2,31) = .316$, $\underline{p} > .05$].

TABLE 8

Means and Standard Deviations for the Stories Told to Pictures (Problem-Solving Measure) for Young Teen, Older Teen, and Adult Mothers

	YOUNG TEEN < 17 n = 11	OLDER TEEN 18-19 n = 14	ADULT 20+ n = 9	F for Group effect
DETAIL OF OBSERVATION	50.273 (17.106)	43.857 (11.245)	52.556 (14.492)	ns
UNDERSTANDING OF ADULT ROLE	4.273 (2.901)	4.500 (2.955)	3.667 (3.279)	ns
ALTERNATIVES	14.727 (2.370)	17.000 (3.762)	16.222 (3.667)	ns
ADEQUACY OF METHOD CHOSEN	19.455 (3.328)	18.642 (2.098)	19.111 (2.088)	ns

SD's in parentheses

Note: Values for "Understanding of Adult Role" can range from 0 to 25.

Values for "Adequacy of Method Chosen" can range from 0 to 35.

Values for "Detail of Observation" and for "Alternatives" have no upper limit.

Correlational Analyses

Zero-order correlations were calculated to determine the relationships among the variables for the entire sample and for the three groups of mothers separately. The inter-correlations among the variables for the total sample are presented in Table 9. Correlations between knowledge error and perceived competence were not significant, but were in the expected direction; mothers with higher perceived competence had less error on the knowledge of infant development measure.

Two of the four problem-solving scales, Understanding of Adult Role and Alternatives, correlated significantly with error scores on the knowledge of infant development measure (r = -.35 and -.34, $p < .05$); mothers who had lower error scores on knowledge of infant development had a better understanding of the importance of the parental role and listed more options for handling the situations presented in the pictures. The correlations between knowledge of infant development and the other two problem-solving scales, Detail of Observation and Adequacy of Method Chosen, were not significant, but in the expected direction.

Correlations between perceived competence and problem-solving were also examined. None of these correlations was significant, however. The magnitudes of the correlations were very low (Range = .01 to .20) and unexpectedly, there were several negative relationships between total score and

subscale scores of the subscale of the Parenting Sense of Competence Scale (PSOC) and the problem-solving scales.

As expected, the two subscales of the PSOC, Skills/Knowledge and Value/Comfort, were positively correlated with the total scale score of the PSOC (r = .88 and r = .77, p < .0001) and with each other (r = .37, p <.05). Only two of the problem-solving scales correlated significantly with each other, Alternatives and Adequacy of Method Chosen (r = .37, p < .05).

Table 10 presents the intercorrelations of the measures separately for each of the three groups of mothers. For the older teen mothers, knowledge error scores were significantly correlated with the total scale of the Parenting Sense of Competence measure (r = -.80, p < .01) and with the Skills/Knowledge subscale (r = -.77, p < .01); the correlation between knowledge error and the Value/Comfort subscale was marginally significant (r = .51, p < .10). For the younger teen mothers, only the correlation between knowledge error and the Value/Comfort subscale was marginally significant (r = .56, p < .10). Finally, for the adult mothers, the correlations between the error scores on the knowledge of infant development measure and the perceived competency scales were all non-significant and in the opposite direction from that expected; knowledge error and perceived competency were positively related.

TABLE 9

Intercorrelations of Measures of Knowledge of Infant Development, Perceived Parental Competence, and Problem-Solving Ability for the Total Sample of Mothers

		1	2	3	4	5	6	7	8
KNOWLEDGE									
1	Error Total	1.00							
PERCEIVED COMPETENCE									
2	Total	-.20	1.00						
3	S/K	-.13	**.88*** **	1.00					
4	V/C	-.21	**.77*** **	**.37***	1.00				
PROBLEM-SOLVING									
5	Observations	-.07	-.10	-.09	-.08	1.00			
6	Adult Role	**-.35***	.06	-.01	.13	.13	1.00		
7	Alternatives	**-.34***	-.20	-.14	-.20	-.12	.20	1.00	
8	Adequacy	-.06	.01	-.06	.09	-.27	.01	**.37***	1.00

* $p < .05$, *** $p < .0001$

TABLE 10

Intercorrelations of Measures of Knowledge of Infant Development, Perceived Parental Competence, and Problem-Solving Ability for Each Group of Mothers

	1	2	3	4	5	6	7	8
YOUNG TEEN MOTHERS								
KNOWLEDGE								
1 Error Total	1.00							
PERCEIVED COMPETENCE								
2 Total	-.25	1.00						
3 S/K	-.04	**.95*** **	1.00					
4 V/C	**-.56+**	**.83** **	**.61***	1.00				
PROBLEM-SOLVING								
5 Observations	.08	-.45	-.33	**-.53+**	1.00			
6 Adult Role	-.41	.20	.09	.36	.21	1.00		
7 Alternatives	.18	-.30	-.33	-.17	-.23	.07	1.00	
8 Adequacy	-.06	-.20	-.30	.03	-.50	-.29	.39	1.00
OLDER TEEN MOTHERS								
KNOWLEDGE								
1 Error Total	1.00							
PERCEIVED COMPETENCE								
2 Total	**-.80** **	1.00						
3 S/K	**-.77** **	**.90*** **	1.00					
4 V/C	**-.51+**	**.73** **	.35	1.00				
PROBLEM-SOLVING								
5 Observations	-.38	.30	.12	.44	1.00			
6 Adult Role	-.16	.29	.17	.35	.20	1.00		
7 Alternatives	-.40	.43	.45	.22	-.24	.18	1.00	
8 Adequacy	.00	.17	.20	.04	**-.47+**	.24	**.67** **1.00	
ADULT MOTHERS								
KNOWLEDGE								
1 Error Total	1.00							
PERCEIVED COMPETENCE								
2 Total	.45	1.00						
3 S/K	.50	**.76***	1.00					
4 V/C	.00	.48	-.21	1.00				
PROBLEM-SOLVING								
5 Observations	-.06	**-.77***	-.34	**-.70***	1.00			
6 Adult Role	-.56	-.36	-.31	-.13	.08	1.00		
7 Alternatives	**-.69***	**-.74***	**-.60+**	-.31	.28	.33	1.00	
8 Adequacy	-.26	-.29	-.29	-.04	.30	.24	.26	1.00

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .0001$

For both the young teen mothers and the older teen mothers, there were no significant relationships between knowledge error scores and the problem-solving scales. However, for the adult mothers, there was a significant correlation between knowledge error scores and Alternatives (r = -.69, p < .05); mothers who had less errors on knowledge of infant development listed more options for handling the parenting situations.

Examination of the relationships between perceived competency and problem-solving for each group of mothers also revealed differences. One marginally significant relationship for the young teen mothers was found, that between the Value/Comfort score and the Detail of Observation score; however, the direction of the relationship was opposite from that expected (r = -.53, p < .10). None of the correlations between perceived competency and problem-solving were significant for the older teen mothers. However, for these mothers the relationships were in the expected direction; that is, greater perceived competency was related to greater problem-solving skills.

For the adult mothers, the relationships between perceived competency and problem-solving skills were again negative (i.e., greater perceived competency associated with poorer problem-solving skills). The correlations between Detail of Observation and Alternatives were significantly related to total perceived competency (r = -.77 and -.74, p <

.05). In addition, Detail of Observation scores and Value/Comfort scores were significantly correlated (r = -.70, p < .05) and the relationship between Alternatives and Skills/Knowledge scores was marginally significant (r = -.60, p < .10).

For the older teen mothers, the correlation between Adequacy of Method Chosen and Alternatives was significant (r = .67, p < .01), and the correlation between Adequacy of Method Chosen and Detail of Observations was marginally significant (r = -.47, p < .10). Although the relationship between Adequacy of Method Chosen and Alternatives was in the expected direction, that between Adequacy of Method Chosen and Detail of Observation was not. There were no significant correlations between the problem-solving scales for either the young teen mothers or the adult mothers.

CHAPTER IV

DISCUSSION

The present study compared young adolescent, older adolescent, and adult mothers on several cognitive measures of effective parenting. The purpose of this research was to determine whether the three groups of mothers differed significantly on their knowledge of child development, on their level of perceived parental competence, and on their problem-solving ability. More specifically, with regards to knowledge of child development, the study sought to determine whether the mothers differed on their knowledge of infant abilities in specific developmental areas (i.e., motor, personal-social, cognitive, and language areas), whether they differed on knowledge of first-year and second-year infant abilities, and whether they were more likely to underestimate or overestimate normal development. And finally, the study sought to examine the relationships among knowledge of child development, perceived parenting competence, and problem-solving ability.

Knowledge of Child Development

With respect to overall knowledge of infant abilities, the hypothesis that the young teen mothers would be less knowledgeable than the older teen mothers and the adult

mothers was not supported. Overall, the majority of mothers in this study regardless of their age lacked knowledge of basic developmental norms. The magnitude of errors in mothers' expectations regarding development ranged from 3 to 5 months. This lack of difference between the groups in overall knowledge of infant abilities was unexpected because several authors have found that adolescent mothers lack general knowledge of developmental milestones (De Lissovoy, 1973; Epstein, 1980; Roosa, 1983; Gullo, 1985; Reis, 1989).

As predicted, examination of knowledge of infant abilities in specific developmental areas revealed that mothers knew more about their infants' motor and language abilities than they did about their infants' cognitive and personal-social abilities. This finding is consistent with previous research conducted by Gullo (1985) and Epstein (1980).

However, it is interesting to note that the interaction between mothers' age group and developmental area was found to be approaching significance. For motor items, the error scores for the three groups of mothers appear about equal. For the language and cognitive items, the trend indicates that the young adolescent mothers had the greatest error, that the adult mothers had the least error, and that the older adolescent mothers had intermediate error scores. The pattern is reversed for the personal-social items; here the trend indicates that adult mothers had the greatest error, that the

young adolescent mothers had the least error, and that the older adolescent mothers' error scores were intermediate. The marginally significant interaction between mothers' age group and developmental area challenges previous research conducted by Gullo (1985, 1988) indicating that adult mothers were better than adolescent mothers at predicting the emergence of infant behaviors in each of the four developmental areas.

In terms of knowledge of first-year and second-year infant abilities, results of this study indicate that error scores for second year items were greater than for first year items for both the young teen mothers and the older teen mothers. In contrast to Gullo's (1985, 1988) findings which indicated that adult mothers were better at predicting first year behaviors, this study found no significant between-groups difference on knowledge of first year behaviors. In addition, although Gullo (1985, 1988) found that there were no differences among adolescent mothers and adult mothers in their ability to predict second year behaviors, the results of the present study reveal a trend indicating that the adult mothers were better than both groups of adolescent mothers at predicting second year behaviors. Perhaps this resulted from the fact that the adult mothers were more likely to have children over 12 months of age, and therefore, had more of an opportunity to observe the infant behaviors and benefit from experience. It should be noted, however, that the magnitude of error for second year items for the adult mothers is still

rather large, approximately 4.3 months. The emergence of second-year behaviors appear to be more difficult to identify than first-year behaviors.

Finally, with respect to overestimation or underestimation of the emergence of infant abilities, results of this study indicate that the young adolescent mothers were more likely to overestimate infant abilities; that is, they were more likely to expect infant abilities to appear earlier than they normally do. There were no significant differences between the number of late and early responses for the older adolescent mothers or for the adult mothers. Although not significant, the pattern for the older adolescent mothers is similar to that of the young adolescent mothers indicating more early responses than late responses; however, the pattern for the adult mothers is different from both groups of adolescent mothers showing that the adult mothers responded late to more items.

The tendency to overestimate or underestimate infant abilities was also examined for each developmental area. Both the young adolescent mothers and the older adolescent mothers overestimated infants' motor abilities; that is, they expected them to occur earlier than the norm. The adult mothers were just as likely to overestimate as to underestimate infant motor abilities. Only the young adolescent mothers significantly overestimated infants' cognitive abilities. Contrary to the other domains of infant

abilities, all three groups of mothers underestimated the infants' personal-social abilities; that is, the mothers expected these abilities to begin later than normal. And finally, although not significant, the pattern for language abilities is similar to that of the motor domain; both groups of adolescent mothers responded early to more language items and the adult mothers responded late to more items.

These findings contradict Gullo's (1985, 1988) findings of no clear patterns of either over- or underestimation of the emergence of infant abilities for adolescent or adult mothers. However, except for the results from the personal-social domain, these findings are consistent with De Lissovoy's (1973) and Field's (1980) findings that adolescent mothers tend to expect infant behaviors to emerge earlier than they normally do. In addition, older adolescent mothers, while still more likely to underestimate infant abilities than adult mothers, did so less than the younger adolescent mothers.

Perceived Parenting Competence

With respect to perceived parental competence, the hypothesis that the young adolescent mothers would have the lowest level of perceived parenting competence was not supported. In fact, for both the total scale and the Value/Comfort subscale of the Parenting Sense of Competence Scale, the young adolescent mothers had greater parenting self-esteem or perceived competence in parenting situations than the older adolescent mothers. The results indicate that

the young adolescent mothers report more overall sense of competence as mothers and more comfort and satisfaction in the maternal role than did the older adolescent mothers. Although the young adolescent mothers had higher perceived competence than the adult mothers, the difference was not statistically significant. Similarly, there was no significant difference between perceived parenting competence scores for the adult mothers and the older adolescent mothers. The three groups of mothers did not differ on the Skills/Knowledge subscale, indicating that there were no significant differences on their perceptions of the degree to which they have acquired the skills and knowledge to be good mothers.

Because earlier studies have not compared adolescent and adult mothers on their level of perceived parenting competence, there is no support in the literature for this finding. The literature on general self-esteem and personal efficacy (i.e., not relating specifically to parenting competence and parental self-esteem), however, indicates that teenage mothers have lower feelings of both personal esteem and personal efficacy than nonteenage mothers or childless women (McLauglin & Micklin, 1983; Thompson, 1984). In addition, McLauglin and Micklin (1983) report that there is evidence that higher personal efficacy is associated with increasing age. These findings would seem to counter that of the present study which showed that the youngest group of mothers had the highest level of perceived parenting

competence and parenting self-esteem.

The results of the present study also differ from Streetman's (1987) results which found no significant differences in self-esteem between adolescent mothers and nonmothers. However, Streetman's (1987) study did find that the younger age group of adolescents (14-17) measured significantly higher on self esteem than did the older age group (18-19). If general self esteem or general self-efficacy is comparable to that associated with parenting situations, this finding may be consistent with the results of the present investigation which found the younger adolescent mothers to have the highest perceived parental competence. Inclusion of a general measure of self-efficacy or self-esteem would allow for a comparison of a mother's general efficacy with perceived competence in the parenting situation.

Other sample characteristics may also help account for the finding that the youngest adolescent mothers were more confident about parenting overall and appeared to value parenting more highly. Since the young adolescent mothers tended to have had more child rearing experiences (i.e., helped care for siblings and babysitting experience) and more child-related coursework, it may be that these experiences affected their level of perceived parenting confidence. Experience with children has been found to be a contributing factor to perceived parenting competence (Finley, 1990) and dissatisfaction with the maternal role has been associated

with less child development preparation information (Stern & Alvarez, 1991). Additionally, the higher the level of anticipatory socialization (both formal education or training and informal preparation), the less the difficulty of the transition to parenthood (Steffensmeier, 1982).

Another factor which may be responsible for the higher parenting confidence and parenting self-esteem of the younger adolescent mothers is the fact that the younger mothers were more likely to be living with their parents and/or with their boyfriends. These young mothers, therefore, may be receiving more social support than the other mothers. Research has shown that young mothers who receive support from their own mothers report less stress, an increase in self-esteem, and greater satisfaction with the maternal role (Colletta & Lee, 1983; Thompson, 1986). In addition, the baby's father or the teen's current partner has been found to enhance a teenage mother's self-worth, sense of maternal competency, and attachment to the baby (Cervera, 1991; Cooley & Unger, 1991). According to Thompson (1986), "an intimate interpersonal relationship fulfills the need for connectedness which affirms one's identity, provides a sense of security, and communicates attachment" (p. 1018).

Still another reason for greater self-esteem among the younger adolescent mothers is that having a baby elevated their status with their families and among their friends. Furstenberg (1991) states that "in neighborhoods and families

where teenage parenthood is a familiar event, there is a cultural script for entering parenthood prematurely--even though it may not be the preferred way of starting a family" (p. 134). Within some subcultures, therefore, teenage parenthood may be normative (Furstenberg, 1991). According to Ketterlinus, Lamb, and Nitz (1991), the transition to parenthood may have positive psychological or social benefits (e.g., enhanced self-esteem or social competence for some adolescents. Becoming a parent may allow adolescents to become members of the adult society and its social support networks (Ketterlinus, Lamb, & Nitz, 1991). In addition, Furstenberg (1991) reports that childbearing may provide direction and purpose to teens whose future prospects appear bleak.

Problem-Solving Ability

With respect to problem-solving ability, the hypothesis that the youngest mothers would have the poorest problem-solving abilities was not supported. No significant between-groups differences emerged on any of the four problem-solving subscales (Detail of Observation, Understanding of Adult Role, Ability to Brainstorm Alternatives, and Adequacy of Method Chosen for Handling the Situation). This lack of significant differences contrasts with previous research on adolescent cognitive development which suggests that throughout adolescence there are changes in both the degree and the sophistication of use of interpersonal problem-solving

strategies such as the ability to generate multiple solutions to an interpersonal problem and the ability to anticipate and evaluate the consequences to each alternative solution (Piaget, 1958; Spivack & Shure, 1985).

Findings of previous research indicate that adolescent mothers, compared to adult mothers, appear to be less competent caretakers and to have greater difficulty in discriminating between appropriate and inappropriate interactions (e.g., Lawrence, et al., 1981; Schilmoeller & Baranowski, 1985; Culp, et al., 1991). Moreover, Panzarine (1989) found that adolescent mothers with poorer problem-solving skills (means-end problem solving) evinced less optimal behavior in their interactions with their infants. Although the present study did not observe actual caretaking behavior or mother-child interactions, no differences were found between adolescent and adult mothers on their problem-solving abilities. Overall, the majority of mothers in this study, regardless of their age, performed poorly on the problem-solving subscale Understanding of Adult Role. The mothers failed to acknowledge the importance of adult interaction and intervention with infants. In addition, performance on the subscale Adequacy of Method Chosen was low to moderate, suggesting that the mothers lacked competence in deciding upon appropriate actions. Observations of mother-child interactions would be required to affirm or refute such a link between problem-solving abilities and parental

behavior.

Interrelationships Among the Variables:

As expected, knowledge of child development correlated positively with problem-solving abilities. This finding is consistent with previous studies of parental reasoning in adult mothers which have found that knowledge of child development is related to problem-solving ability (Newberger, 1980; Holden, 1988; Finley, 1990). In the present study, significant relationships were obtained among knowledge of child development and two of the problem-solving subscales, Understanding of Adult Role and Alternatives. Mothers with greater knowledge of infant abilities (i.e., lower error scores) better understood the importance of the adult role and listed more alternative solutions for handling the parenting situations. Although not statistically significant, the correlations between knowledge and the remaining problem-solving subscales, Detail of Observation and Adequacy of Method Chosen, were in the expected directions; mothers with greater knowledge were more likely to list more observations and were more likely to choose more appropriate methods for dealing with the parenting situations presented to them. When the three groups of mothers were considered separately, a significant relationship was found between knowledge of child development and the number of alternative solutions generated to the parenting situations in the problem-solving measure for the adult mothers only.

Correlational analyses did not reveal any significant relationships between knowledge of child development and perceived parenting competence. However, the relationship was in the expected direction, suggesting that mothers with greater perceived competence were more likely to have less knowledge errors. When the three groups of mothers were considered separately, however, a significant positive relationship between knowledge of child development and perceived competence (Total and Skills/Knowledge) was found for the older adolescent mothers.

Contrary to expectation, for the total sample, perceived parenting competence and its components, Value/Comfort and Skill/Knowledge, did not significantly correlate with problem-solving abilities in this study. Since self-efficacy affects performance (Bandura, 1982), mothers who had a greater sense of perceived competence were expected to perform better on parental problem-solving. Unexpectedly, several negative correlations, although very low, were observed between perceived competence and problem-solving abilities. In fact, when each of the three groups of mothers was considered separately, several significant negative relationships were found for the adult mothers between perceived competence and problem-solving abilities. These findings are inconsistent with those of Finley (1990) which found perceived parental competence to be positively related to several aspects of problem-solving abilities in adult mothers. This suggests,

perhaps, that the mothers in the present study may be overly confident in perceiving themselves as competent and possessing the skills needed to be a good parent. The mothers may not be aware that there may be better ways to parent, and this may adversely affect the development of their children.

Limitations and Future Research:

This study addressed several methodological issues that have limited previous studies, including the use of an adult comparison group and the examination of young teen mothers and older teen mothers separately. However, interpretation of the findings reported in this study must be made in light of several limitations, and these limitations should be considered when planning future research on adolescent parenting and on parenting in general.

The first limitations concern the sample and the sample size. The present sample was small, primarily African American, and of predominantly low socioeconomic status. Generalizations, therefore, should be made cautiously and limited to this particular group. Furthermore, the participants in this study represent a volunteer, nonrandom sample of mothers who are receiving social services. It is possible that mothers who do not partake in social services and/or do not participate in research somehow differ systematically from those who do. For example, Lineberger (1987) cites several studies which found that adolescent mothers who had not attended parent education programs were

more dependent, more isolated, more stressed in raising children, and more unrealistic in their expectations of their children than adolescent mothers who had attended parent education programs. Future work in this area should attempt to recruit mothers who do not participate in parent education programs and/or other social services and also investigate potential racial differences between African American and Caucasian and/or Latino adolescent mothers.

Moreover, group differences on overall knowledge of infant abilities and on problem-solving abilities in this study failed to reach significance, perhaps due, in part, to the low statistical power of the relatively small sample studied. However, it is also possible that the young adolescent mothers were more knowledgeable than expected due to their previous child rearing experiences and child related coursework. It may also be that the young adolescent mothers had more knowledge and skills because they were more likely to live at home with their parents. Research has demonstrated that teen mothers' social ties to extended family members, particularly their own mothers, can enhance their knowledge of normative child development and their parenting skills (Field, 1980; Stevens, 1984; Hofferth, 1987; Sistler & Gottfried, 1990). The young adolescents in the present study, therefore, may have represented the upper end of the parenting distribution of adolescents as reflected by their ability to continue their education and to receive special assistance and

services prior to and after the birth of their babies. Because supportive adults have the potential to influence parenting, the effects of mothers' current living situations on their parenting practices need to be examined. The effects of increased level of social support, especially that provided from the adolescent's mother and current partner, and other contextual factors such as ethnicity and social class on adolescent parenting warrants further investigation.

Another limitation of the present study, and perhaps another reason for the lack of group differences, concerns the knowledge and problem-solving instruments used. The knowledge of child development measure used was a revision (shortened version) of an existing measure, the Infant Development Questionnaire (Granger, 1982). Its psychometric properties have not yet been sufficiently explored. Preliminary analyses of the shortened version show an overall reliability of .66 (Cronbach's alpha); alpha levels for the developmental domains were even lower, ranging from .13 to .49. Furthermore, the Infant Development Questionnaire may not be sensitive enough to detect small differences among the three groups; the wide range of normal variation in achievement of developmental milestones lessens the scales's ability to discern differences between groups. A different knowledge instrument, and one with better reliability, might help researchers better determine whether there are significant differences between adolescent and adult mothers on their knowledge of child

development. Development of more psychometrically sound measures of parenting knowledge is clearly in order (Stevens, 1984).

Similarly, more information is needed about the reliability and validity of the problem-solving measure used in this study, the Stories Told to Pictures. Inter-rater reliability for some of the scales was low, due to difficulties encountered in the scoring procedures. The instrument was chosen because it was designed to measure the ability to generate stories about parent-child interactions that reflect developmentally and effective parent-child outcomes; however, until now, it has not been used with adolescent or adult participants. Further exploration of the appropriateness of the use of this instrument with participants other than children is needed. Moreover, there is a need to explore further the relationship between cognitive abilities and adolescent parenting behaviors. Future research should include more direct measures of maternal cognitive status (i.e., concrete vs. formal operations) and cognitive ability (i.e., cognitive maturity).

The present study is also limited by its use of primarily self-reports. Unfortunately, measures of mother-child interaction were not included in this study. Future research might use more objective, behavioral measures of problem-solving and parenting skills to enhance the validity of their findings. Heath's (1990) projective technique seems to be a

promising intermediate method for tapping parental reasoning and behavior when direct observation is not possible. In addition, future researchers should attempt longitudinal examinations of the impact of knowledge of child development, perceived parental competence, and problem-solving skills on adolescent parenting behavior and child developmental outcomes.

Given the small number of subjects in this study, replication of these results with a larger sample is needed. Tentatively, however, these data appear to have important implications for the enhancement of programs aimed at fostering good parenting skills, both in adolescents and in the population as a whole. Although many programs exist to prepare mothers for childbirth, too few programs exist to prepare them for parenting. Interventions aimed at modifying unrealistic expectations as to when infants achieve various developmental milestones, at enhancing parental self-esteem and sense of competence, and at training in problem-solving skills may be fruitful for both adolescent and adult mothers.

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Appendix A

INFANT DEVELOPMENT QUESTIONNAIRE
(Shortened Version)

As you know, during the first two years (24 months) of a baby's life he or she learns to do many things. On this questionnaire there are 32 questions about the things babies and young children learn to do and when they learn to do them.

After each question, the numbers 1 through 24 are listed. These numbers correspond to the first 24 months of a baby's life.

Read each question to yourself as it is read out loud. Then decide the age (in months) you think babies are first able to do the thing described in the question. Finally, circle the number that is the same as the age you decided upon. Only circle one number for each question.

Here is an example:

When are most babies first able to eat with a spoon?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

If you think that babies are first able to eat with a spoon when they are 18 months old, you would circle the number "18" like this;

When are most babies first able to eat with a spoon?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

The correct answer to this question is 15 months so an answer of "18" is pretty close. What is important on this test is not how many questions you answer exactly correct, but how close your answers are to the correct answers.

On this questionnaire there will be some questions for which you will not be very sure of an answer. On these questions it is alright to guess. Please make sure, then, that you answer every question.

1) At what age are most babies first able to lift their head from time to time when being held upright?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

2) At what age do most babies begin to say at least four words?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

3) At what age do most babies begin to show feelings like eagerness, simply with the noises they make?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

4) At what age do most babies begin to stand momentarily without any support?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

5) At what age are most babies first able to make several different sounds with their voice?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

6) At what age do most babies begin to babble using two-syllable sounds?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

7) At what age do most babies begin to enjoy looking around their cribs?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

8) At what age do most babies begin to know that they can reach a toy that is on top of a small rug, simply by pulling the rug?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

9) At what age do most babies begin to enjoy putting small objects in a container and dumping them out again?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

10) At what age do most babies begin to pretend, like pretending they are eating something?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

11) At what age are most babies first able to roll over?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

12) At what age do most babies begin to act differently with strangers than with parents?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

13) At what age do most babies begin to be able to replace a bottle that has slipped out of their mouth?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

14) At what age do most babies begin to enjoy looking at picture books?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

15) At what age are most babies first able to overcome simple obstacles, like moving one toy that is in the way of playing with another?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

16) At what age do most babies begin to be particularly interested in looking at their mother's face?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

17) At what age are most babies first able to throw a ball in an overhand fashion?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

18) At what age are most babies first able to take off their own shoes and socks?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

19) At what age do most babies begin to look briefly at bright colored objects?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

20) At what age are most babies first able to help while dressing, by putting their arms in shirt sleeves?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

21) At what age are most babies first able to point to their eyes, nose, or hair as an adult names them?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

22) At what age are most babies first able to build a tower of two blocks?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

23) At what age do most babies begin to walk alone?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

24) At what age do most babies begin to change their facial expression when another person looks at them face-to-face?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

25) At what age are most babies first able to find a rattle they have just dropped?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

26) At what age do most babies begin to wave bye-bye?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

27) At what age do most babies begin to say the words "mama" or "dada"?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

28) At what age do most babies begin to crawl?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

29) At what age do most babies begin to enjoy playing with an adult by, for instance, giving a ball back and forth?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

30) At what age do most babies begin to jabber, that is sound like they are talking even though they are not using real words?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

31) At what age do most babies begin to help around the house by doing very simple tasks, like putting toys away?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

32) At what age are most babies first able to ask for things they want while eating at the table?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

On this test I was sure of (circle one)

a. most of my answers
b. about half of my answers
c. very few of my answers

PARENTING SENSE OF COMPETENCE SCALE
(Adapted Version)

This questionnaire asks for your opinions about different aspects of child-rearing. Please give your own opinions and do not worry about what others may think. You will probably agree with some statements and disagree with others. There are no right or wrong answers to these questions since they are all matters of opinion. Please read each item carefully as it is being read out loud. Then check the extent to which you agree or disagree with each statement.

	STRONGLY DISAGREE 1	SURE 2	NOT AGREE 3	AGREE 4	STRONGLY AGREE 5
1) The problems of taking care of a child are easy to solve once you know how your actions affect your child.	1	2	3	4	5
2) I understand how my actions affect my child.	1	2	3	4	5
3) A difficult problem in being a mother is not being able to tell if you are doing a good or a bad job.	1	2	3	4	5
4) I would make a fine model for a new mother to follow in order to learn how to be a good mother.	1	2	3	4	5
5) Being a mother is often rewarding.	1	2	3	4	5
6) I am often frustrated in caring for my child.	1	2	3	4	5
7) I feel like I'm being manipulated by my child even though I'm supposed to be in control.	1	2	3	4	5

	STRONGLY DISAGREE 1	DISAGREE 2	NOT SURE 3	AGREE 4	STRONGLY AGREE 5
8) My mother was better prepared to be a good mother than I am.	1	2	3	4	5
9) Problems with my child are easily solvable.	1	2	3	4	5
10) If anyone can find the answer to what is troubling my child, it is I.	1	2	3	4	5
11) I feel thoroughly comfortable with my role as a mother.	1	2	3	4	5
12) I have all the skills necessary to be a good mother to my child.	1	2	3	4	5
13) Being a good mother is a reward in itself.	1	2	3	4	5
14) My talents and interests are in other areas, not in being a mother.	1	2	3	4	5
15) Being a mother makes me tense and nervous.	1	2	3	4	5
16) I feel well prepared to be a mother.	1	2	3	4	5

STORIES TOLD TO PICTURES

Instructions for Collecting Data

Five pictures will be shown of children of different ages in varying situations

Upon meeting the participant,
Thank her for being willing to participate in this study.
Inform her that she will be asked to describe what she sees in pictures and tell stories about those pictures and that there is no one right answer... many answers could be possible.

Ask if it is O.K. to write down what she says so we could remember it.

With each picture ask the following questions:
(Always indicate on your protocol any questions asked beyond the first one.)

1. Here is a picture or See this picture (handing picture to participant) Tell me what is happening in this picture.

   (If the participant gives very little information you may need to ask questions such as:)

   a. Do you see anything else in the picture? or
   b. Do you see anybody else or anything else in the picture? or
   c. What do you think was going on when this picture was taken?

2. (After participant has told what is happening) What do you think happened just before this picture was taken? or (If the student indicates something specific happening you can put that into the wording.)

3. Make up a story about what you think might happen next.

4. (The question asked will depend on the specificness of the situation the participant has described.)

   a. If the participant had described a specific situation, say:

      You have just described _____ (give situation as described by participant).

What are all the different things a parent could do in this (name situation). Is there anything else?

b. (If the participant has not described a specific situation, ask the following question related to the specific card:)

First card: If this infant were getting into things she shouldn't be, what are all the different things a parent might do?

Second card: If this infant has woken up and is very unhappy, what are all the different things a parent might do?

Third card: If the two children are fighting over this toy (Point to the toy), what are all the different ways a parent could do to handle the situation?

Fourth card: If this toddler is wanting to investigate the next room, what are all the different ways a parent could handle the situation?

Fifth card: If this toddler is trying to put together a puzzle, what are all the different ways a parent could handle the situation?

5. Which of these ways would you use if you were responsible for this infant (for these children)?

(After participant has given answer ask:)
Why? Any other reasons?

Ask participant if she has any questions about what she has done or the purposes of the process.

Thank her for participating.

For more information about this measure contact
Harriet Heath, Director, The Parent Center, Department of Human Development, Bryn Mawr College, Bryn Mawr, PA 19010

BACKGROUND INFORMATION

1. When were you born? _____
   Month Day Year

2. How many children do you have? _____
   Please specify their date of birth and sex.

	Date of birth	Sex
First Child	_____	_____
Second Child	_____	_____

3. Are you married? _____ Yes _____ No

4. What is your race?
   _____ African American
   _____ Asian
   _____ Caucasian/White
   _____ Hispanic
   _____ Other (please specify) _____

5. Are you currently in school? _____ Yes _____ No

   If yes, what grade are you in? _____

   If you are not in school, what was the last grade of school that you completed? _____

6. Do you have a job? _____Yes _____No

   If yes: What kind of job do you have? _____

   How many hours a week do you work? _____

7. Who do you and your child live with?
   List all persons in your household

Relation to you	Age
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

8. Who has the primary responsibility for taking care of your child? _____

9. What is the annual income for your whole household?

_____ $0 to $10,000
_____ $10,000 to $20,000
_____ $20,000 to $30,000
_____ greater than $30,000

Approximately how much money do you get per week for you and your baby? _____

10. How many brothers and sisters do you have? _____

What are their ages? _____

Were you ever asked to take care of a younger brother or sister? _____Yes _____No

11. Did you, or do you, ever babysit regularly (i.e., once a month or more)? _____Yes _____No

12. Please place an X next to those programs at Family Focus that you have participated in or that you are currently participating in.

_____ Beginnings
_____ Partners
_____ TLC
_____ Teen Cuisine
_____ Teen Baby Nursery
_____ Other (please specify) _____

How long have you been involved with Family Focus? (i.e., indicate the number of months or years) _____

13. Did you participate in a childbirth education program during your pregnancy? _____Yes _____No

14. Have you ever taken a class in school on child development or child care? _____Yes _____No

THANK YOU FOR PARTICIPATING IN THIS STUDY.

VITA

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EDUCATION

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Major: Developmental Psychology

Master's Thesis: A comparative study of young adolescent, older adolescent, and adult mothers on knowledge of child development, perceived parental competence, and problem-solving ability.
Director: Jill Reich, Professor and Chairperson of Psychology, Loyola University of Chicago

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Majors: Psychology and Biology
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Honors Thesis: Estimating the size of the mental lexicon using a count of words in the *Oxford American Dictionary*.
Director: Eugene B. Zechmeister, Professor of Psychology, Loyola University of Chicago

AWARDS AND HONORS

GRADUATE:

Graduate Assistantship 1989-1992
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Graduate Student in Developmental Psychology. Department of Psychology, Loyola University of Chicago. 1989-present

Research Intern at the John D. & Catherine T. MacArthur Foundation, Program on Mental Health and Human Development. Dec. 1992-present

Duties: assist staff by providing background information for the development of new program initiatives in the area of mental health and human development; conducting literature searches, preparing literature reviews.

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Project: Learning to Parent, Learning to Care
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Research Assistant 1988-1989
to Dr. Eugene Zechmeister. Department of Psychology, Loyola University of Chicago.
Project: Vocabulary size and metacognitive knowledge about the mental lexicon.
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Society for Research in Child Development
Midwestern Psychological Association

PUBLICATIONS

D'Anna, C. A., Zechmeister, E. B., & Hall, J. W. (1991). Toward a meaningful definition of vocabulary size. Journal of Reading Behavior, 23, 109-122.

Cull, W. L., D'Anna, C. A., Hill, E. J., Zechmeister, E. B., & Hall, J. W. (1991). When are optimal rates of presentation optimal (for learning)? Bulletin of the Psychonomic Society, 29, 48-50.

Zechmeister, E. B., D'Anna, C. A., Hall, J. W., Paus, C., & Smith, J. A. (in press). Metacognitive and other knowledge about the mental lexicon: Do we know how many words we know? Applied Linguistics, in press.

MANUSCRIPTS IN PREPARATION

D'Anna, C. A., & Duckett, E. (1991). A needs assessment of women students at Loyola University of Chicago. Unpublished manuscript, Loyola University of Chicago.

Zechmeister, E. B., D'Anna, C. A., Healy, N., & Chronis, A. The case for a smaller number: Estimates of the vocabulary size of junior high school students, college students, and elderly adults. Manuscript in preparation.

Zechmeister, E. B., D'Anna, C. A., & Cull, W. L. Vocabulary instruction: Utilizing a computer-based vocabulary program to teach word meanings of 1000 words. Manuscript in preparation.

Zechmeister, E. B., D'Anna, C. A., & Merlino-Gantner, J. C. What's in a dictionary and how much do people know of what's in a dictionary? An examination of word frequency estimates, subjective word-knowledge ratings, and vocabulary knowledge. Manuscript in preparation.

Jose, P. E., Katz, N., & D'Anna, C. A. Development of the comprehension and appreciation of fables. Manuscript in preparation.

WORK IN PROGRESS

Jose, P. E., D'Anna, C. A., & Cafasso, L. Development and construction of the Children's Coping Strategies Scale. Work in progress.

Zechmeister, E. B., Dugoni, B. L., & D'Anna, C. A. An investigation of formal discipline, training, and problem types on methodological reasoning about everyday events. Work in progress.

PRESENTATIONS

Zechmeister, E. B., Hall, J. W., & D'Anna, C. A. (1989, November). Metacognitive knowledge about the mental lexicon. Paper presented at the 30th Annual Meeting of the Psychonomic Society, Atlanta, GA.

Cull, W. L., D'Anna, C. A., Hill, E. J., Zechmeister, E. B., & Hall, J. W. (1990, May). When are optimal rates of presentation optimal (for learning)? Poster presented at the Midwestern Psychological Association, Chicago, IL.

Dugoni, B. L., D'Anna, C. A., & Zechmeister, E. B. (1991, August). Methodological reasoning and pragmatic inferential rules: A cross-sectional analysis. Poster presented at the American Psychological Association, San Francisco, CA.

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Jose, P. E., D'Anna, C. A., & Cafasso, L. (1992, October). Grade school children's experience of stressors and efforts to cope with them. Paper presented at the 1992 Annual Fall Conference of the Far North Chapter of the Chicago Association for the Education of Young Children, College of Lake County, Grayslake, IL.

Jose, P. E., D'Anna, C. A., & Cafasso, L. Ethnic group differences in children's abilities to cope with stress. Submitted for poster presentation at the 1993 Convention of the Society for Research on Child Development, New Orleans, LA.

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The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

December 11, 1992
Date

Director's Signature