Assessment of the Psychometric Features
of Two Perceived Maternal Competence (PMC) Scales
with a Sample of Adolescent Mothers

by

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A Thesis Submitted to the
Faculty of Graduate Studies in Partial Fulfillment
of the Degree of

DOCTOR OF PHILOSOPHY

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ASSESSMENT OF THE PSYCHOMETRIC FEATURES OF TWO PERCEIVED MATERNAL COMPETENCE

(PMC) SCALES WITH A SAMPLE OF ADOLESCENT MOTHERS

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A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University

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DOCTOR OF PHILOSOPHY

M. Loretta Secco          1997 (c)

# ABSTRACT

Over the past decade, the psychosocial characteristic of Perceived Maternal Competence (PMC) has gained recognition for its possible relationship with performed maternal competence (PerMC) usually measured as mother-infant interaction quality or provision of cognitive stimulation in the home. PMC scales with strong psychometric features are required to examine possible relationships among maternal variables, mothering behavior, and infant developmental outcomes. This doctoral study established psychometric properties for the two investigator-developed PMC scales: the prenatal Infant Care Expectation Questionnaire (ICEQ) and the postnatal Infant Care Questionnaire (ICQ).

Theoretical guidance is derived from Belsky's parenting determinants model which emphasizes the interplay of situational, psychosocial, and child characteristics in determining parenting competence and child developmental outcome. Maternal role theory describes PMC as a psychosocial characteristic defined as the mother's self-assessment of her ability to care for and interact with her infant.

Data were collected on a convenience sample of 60, primiparous adolescent mothers (*i.e.*, less than 20 years old) recruited from two clinics typically used for prenatal care by adolescents in Winnipeg. Adolescent mothers were selected to provide a broader range of scores on the PMC scales. PMC was assessed prenatally and during the first and fourth weeks postpartum. Other variables which may influence and/or modify PMC were assessed such as depression, self-esteem, perceived and enacted social support, and socioeconomic factors.

Study findings revealed high internal consistency reliability for the two PMC scales (Cronbach alpha coefficients from .88 to .91) and a significant, three week test-retest temporal stability (Pearson coefficient $r=.69$; $p=.0000$). Construct validity was evidenced by a significant increase in PMC with time in the mothering role from the prenatal to four week measure (Repeated Measures Analysis of Variance; $F=8.09$; $p=.0007$). Although predicted PMC differences between younger (less than 17 years) and older (17 to 19 years) adolescent mothers were seen, small sample size and age group contrast may have contributed to the lack of significance. It is also possible that time and experience in the mothering role are stronger determinants of PMC than age alone.

While concurrent validity correlation between scores on the PMC and a similar scale (*i.e.*, Maternal Self-Report Inventory) failed to achieve predicted strength *(r = .37; p=.01)*, when five less related items were removed from the MSI scale the correlation strength increased (*i.e.*, $r=.51$; $p=.0003$). In this study self-esteem was the strongest explanatory variable accounting for 17.3% of the variance in the PMC scores. The finding of a significant relationship between self-esteem and PMC was consistent with previous research with older mothers. Multiple regression analysis revealed that self-esteem significantly explained the four week PMC scores even after the role of previous experience was controlled.

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# List of Abbreviations

| Abbreviation | Scale |
|---|---|
| PMC | Perceived Maternal Competence |
| PerMC | Performed Maternal Competence |
| ICEQ | Infant Care Expectations Questionnaire |
| ICQ | Infant Care Questionnaire |
| ICQ1 | Infant Care Questionnaire administered at one week postpartum |
| ICQ4 | Infant Care Questionnaire administered at four weeks postpartum |
| MSI | Maternal Self Report Inventory |
| ISSB | Inventory of Socially Supportive Behaviors |
| PSSFa | Perceived Social Support from Family |
| PSSFr | Perceived Social Support from Friends |
| RSE | Rosenberg Self-Esteem |
| BDI | Beck Depression Inventory |

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# I. BACKGROUND

Belsky describes parenting competence as a quality affected by numerous psychosocial features of the parents, child characteristics, and situational factors of stress and support which, in turn, affect child outcomes [1]. Studies have shown that parenting is multiply influenced by factors such as race, poverty, education, social support [2-4], maternal depression [5-7], self-esteem [8], and locus of control [9], but it is difficult to quantify the relative role of each parental variable. Causal links between parenting characteristics and child development outcomes are poorly understood because researchers generally focused on outcomes such as infant attachment behavior and mother-infant interaction. While most people agree that parents play a major role in determining outcomes of their children, we are not sure exactly which parenting characteristics are important. Therefore, clinicians have few means to identify poor parenting situations before actual child health, development, and/or behavioral deficits have occurred. If researchers could delineate the more influential predictors of parenting competence then assessment and screening techniques could be developed to detect and prevent negative child outcomes.

This doctoral investigation is the first phase of a longitudinal study of the role of perceived maternal competence (PMC) in determining parenting behavior, stress, and child outcomes for a sample of adolescent mothers. The broad theoretical bases for this investigation are provided by Belsky's Parenting Determinants Model [1] and maternal role theory [10-12]. PMC is the core study variable and is generally defined as a mother's self-evaluation of her adaptation to the social role of mother [12-22]. This first phase describes characteristics of adolescent mothers and establishes psychometric data

for two, investigator-developed PMC scales. Outcome data on mothering behavior in the home, child development, and parenting stress are being secured during the second phase of the study. Adolescent mothers are studied because, compared with older mothers, they have more adverse social support, psychosocial characteristics [9, 23-25], performed mothering competence [16, 25-28], and child outcomes [29-34] and will likely provide a range of scores on study variables and may provide crucial information on possible parenting intervention strategies.
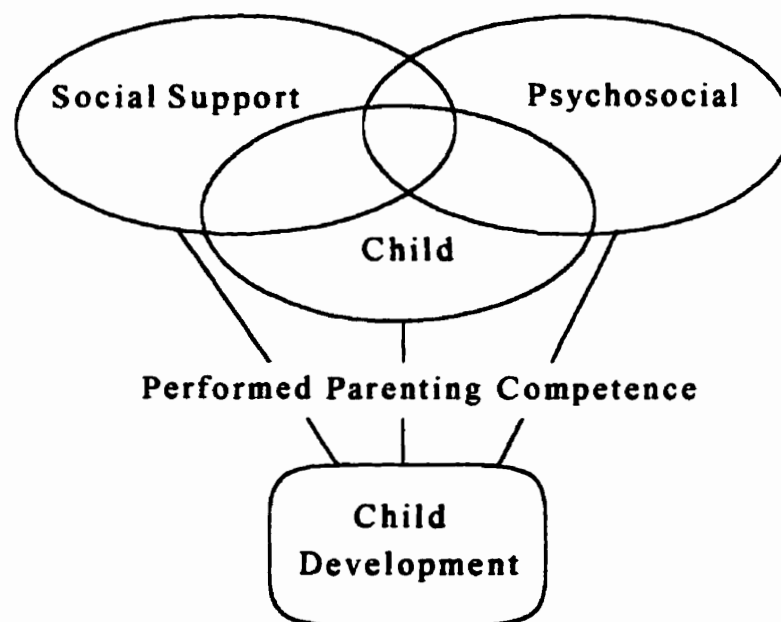


Figure 1: Balloon Analogy of Parenting Competence

## Belsky's Parenting Determinants Model

Belsky's parenting determinants model conceptualizes parenting as a complex, multifaceted process simultaneously affected by numerous variables which can be categorized into psychosocial, social support, and child factors [1]. Performed parenting

competence is characterized by the parent's attitudes and behaviors toward the child and is measured in terms of subsequent child health and developmental outcomes. Figure 1 provides a pictorial analogy using balloons to represent the major categories of factors affecting parenting competence, the strings are performed parenting behaviors, and the basket is child development outcomes. Positive psychosocial, social support, and child characteristics may be viewed as the basic elements required to inflate the balloons or promote positive child development.

The importance of **social support** became evident as numerous cross-sectional and several longitudinal studies highlighted a relationship with parental psychosocial well-being, mothering competence, and child development. Various types of social support have been significantly associated with parent-child attachment [35], satisfaction with parenting, affect displayed during mother-interaction [36, 37], infant care confidence [38], and parenting stress [39, 40].

Although the influence of **child characteristics** on parenting quality is relatively unknown, several researchers have noted a significant relationship between infant temperament and maternal attitudes [14, 22, 41, 42]. In one study, a significant relationship between difficult infant temperament and cognitive stimulation provided in the home remained even after controlling psychosocial and contextual factors (education and self-esteem) [43].

Researchers in many disciplines, some of which have not traditionally focused on psychosocial variables, have recently underscored the strength of **psychosocial characteristics** in determining parenting competence. In fact, Belsky proposed that

parental psychosocial resources are the strongest factor determining the degree to which parenting behavior is developmentally-oriented and positive. Several important psychosocial factors examined to date include maternal depression, self-esteem, and perceived competence in infant care. Maternal depression has been significantly related with maternal attitudes [44, 45], mothering behavior during interaction [5, 7, 46], reports of abusive behavior toward the infant [44], and child development [6, 45, 46]. Another important maternal psychosocial attribute, self-esteem, [47, 48] has been significantly associated with maternal stress level [49], mothering behavior [8, 43], and perceived maternal competence [42, 50-52].

## Perceived Maternal Competence (PMC)

The central study variable, perceived maternal competence (PMC), is generally defined as the mother's self-assessment of her ability to care for and interact with her infant. PMC arises from the broader area of maternal role theory which stems from the perspectives of social and interactionist role theory [10-12]. Since the 1960's, nursing theorists have described dynamic, psychosocial processes that occur as a woman takes on, or attains, the social role of mother [10-12]. Rubin first described the complex process of maternal role attainment involving mimicry of other mothers, role play in mothering behaviors, and fantasy about the infant and self as mother [10].

Mercer applied role acquisition theory to the development of maternal role attainment through four progressive stages [11, 51]. During the anticipatory stage, the pregnant woman fantasizes about the role, relates with her fetus in utero, and role plays being a mother [10]. The formal stage begins when the baby is born and the mother

begins to provide care for the infant and, due to unsureness and unfamiliarity with infant care, she often relies on directions of other mothers and experts to make decisions [51]. During the later informal stage, the mother decides on her own infant care practice and style rather than following the rules and directions of others. The mother learns to respond to her own infant's cues and to develop her unique mothering responses. The final personal stage, or the endpoint if maternal role attainment, involves a '... sense of harmony, confidence, and competence in how she performs the role [10] which is evidenced through confidently enacting the culturally defined behaviors associated with the maternal role. Mercer described the personal stage as the 'maternal role identity' stage which is '... characterized by the mother's sense of competence and satisfaction in her role, attachment to the infant, harmony with other roles, and comfort with the maternal identity' (p. 334 in [51].

Nursing theorists have also identified the major role of the infant and his/her response to the mother's physical and interactional care in the evolution of maternal role attainment. Rubin described maternal identity as residing in the concepts of I (mother) and you (infant) which influence each other (cited in [12]). Maternal identity evolves and is enhanced through the mother-infant relationship as the mother becomes familiar with and learns what to expect from the infant. Maternal identity is reflected both in the mother's positive regard for her infant and for herself as a mother (Rubin, cited in [12]. Maternal role attainment is a process which occurs as a woman becomes a mother and ends with the achievement of maternal identity or a sense of comfort in being a mother. Maternal role attainment has also been characterized by the mother's sense of harmony,

confidence, and competence in performing her role which includes both her relationship with her infant [16] and confidently enacting the socially defined behaviors associated with the role of mother [12]. According to Rubin, as described by Walker *et al.*, maternal identity entails both formation of the mother-infant relationship and the boundaries between mother and infant [12].

Walker *et al.*, recently specified three components of maternal role attainment or competence as perceived maternal competence (PMC), performed maternal competence (PerMC), and maternal identity [12, 53]. PerMC is defined as the quality of demonstrated mothering behaviors observed by others while PMC is the mother's self-evaluation of her ability to perform mothering behaviors and may be an indirect reflection of PerMC. Maternal identity is an affective component characterized by the mother's assessment of how well she is doing with infant care and mothering compared with other mothers and possible caregivers. This description provided a degree of theoretical clarity and created avenues to establish validity for the PMC scales through assessment of empirical links between PMC and PerMC, several of which have been reported by researchers already [22, 41, 54].

## PMC and Other Psychosocial Variables

Other psychosocial variables important to consider in any study of maternal competence include depression and self-esteem level because they may also relate with PMC. Although few researchers have examined the role of depression in adolescent mothering, studies with older mothers have indicated that maternal depression is related

with maternal attitudes [44, 45], mothering behavior during interaction [5, 7, 46], reports of abusive behavior toward the infant [44], and child development [6, 45, 46]. Wrate alluded to a connection among PMC, PerMC, and depression because depression had an enduring effect on mother-infant interaction only if the mother was also '...excessively concerned about her child or uncertain about her maternal role' [45](p. 625).

Depressed mothers scored significantly lower on many interaction and play behaviors [7] and displayed significantly more negative expressions during interaction [5]. An enduring relationship between postpartum depression and later maternal interaction behavior and child language ability was displayed in a matched control study where only 19 index children compared with 30 control children (49 in the index and control groups; p.<05) could combine two words using the Denver Developmental Screening Test [46]. Significantly lower general cognitive scores were reported among infants whose mothers were depressed during the first 3 and 12 months but not during pregnancy only or at 4 years [6]. One study with adolescent mothers reported significant differences between depressed and non-depressed groups in terms of maternal confidence and mother-infant interaction behavior during feeding [55]. These findings indicate that maternal depression is an important psychosocial characteristic to consider in examining relationships among PMC, PerMC, and child development.

Self-esteem is an important psychosocial attribute for adolescent mothers [47, 48]. While self-esteem is considered a core personality variable which may overlap conceptually with PMC, PMC also includes the component of self-evaluation of performance in the mothering role [41]. Researchers have reported lower self-esteem

among adolescent mothers compared with both older mothers and nonmothering adolescents [56, 57]. Relationships between self-esteem and adolescent maternal attitudes, stress [49], and mothering behavior [8, 43] have also been documented. Strong associations have been reported between self-esteem and both PMC [41] and PerMC [8]. Self-esteem was a highly significant predictor of PMC for both primiparous and multiparous mothers [51] and for mothers of high and low risk infants [50]. Self-esteem has also shown a mediating effect on depression levels of postpartum mothers through its effect on everyday stressors [58].

## PMC and Social Support

Belsky's parenting theory describes a strong relationship between social support and parenting competence and findings from both cross-sectional and longitudinal studies relate psychosocial well-being and mothering competence to social support. Studies have revealed higher social support levels among older mothers [28, 30, 59, 60] and significant association with attachment [35], satisfaction with parenting, affect displayed during interaction [36, 37], infant care confidence [38], and parenting stress [39, 40]. For the adolescent mother, various types of social support have been significantly related with parenting [23], emotional stress [49], and parenting satisfaction [61]. Social support level was moderately to strongly related with PMC for both older $(r=.69; p<.01 [41]; r=0.48; p=.001 [22])$ and adolescent mothers $(r=-.71; p<.001; [23])$ and with performed mothering-infant interaction for older mothers $(r=0.48; p=.001 [22])$

.

Unfortunately, most researchers have examined social support in adolescent mothering using cross-sectional designs which limit causal conclusions to be drawn from any reported relationships [62]. One cross sectional study with older mothers revealed a significant relationship between social support and child development with socioeconomic status (SES) and PerMC controlled [63] but the sample was limited to Caucasian, middle class, married, and well educated mothers. The importance of maternal age and social support was evidenced in a longitudinal study of an overall model of factors affecting child development with control of age, education, and SES [30]. Compared with older mothers, adolescent mothers experienced significantly more life stress, less child care support, and displayed less positive PerMC which together significantly predicted child mental development.

## PMC and Infant Characteristics

Evidence is growing for relationships between PMC, PerMC, and child characteristics. Several descriptive studies with older mothers have detected at least moderate relationships between infant temperament and PerMC during mother-infant interaction. Also, moderate relationships have been reported between PMC and infant difficulty ($r=-.50$; [22]), infant behavior as 'better than average' ($r=.36$; [41]), infant behavioral style ($r=-.32$; [14]), and fussy/difficult behavior ($r=-.30$; [42]). In fact, in one study a stronger relationship was reported between infant difficulty and PMC ($r=-.50$) compared with PerMC during mother-infant interaction ($r=-.30$; [22]). The relationship between infant temperament and PMC held even after objective infant behavior was

controlled using multiple regression [42]. The importance of infant temperament was underscored in another study where difficult infant temperament significantly explained PerMC (HOME scores) of adolescent mothers even after controlling the effects of psychosocial (education and self-esteem) and contextual factors [43].

## PMC and Adolescent Mothers

PMC may be especially important for adolescent mothers who have less positive psychosocial attributes, social support, and PerMC than older mothers [9, 23-26, 60]. Compared with older mothers, adolescent mothers have been consistently rated less competent in PerMC such as mother-infant interaction and provision of cognitive stimulation [25-30] and their children more often suffer less positive mental, language, and social development [29, 31-33, 64]. The few studies with adolescent mothers have revealed lower PMC scores [16] and strong relationships with both social support level and parenting stress [23].

Researchers have generally portrayed adolescent mothers less positively than older mothers in terms of psychosocial attributes, performed mothering competence, and child development outcomes. Although several American reports suggest that adolescent mothering does not adversely affect infant and maternal health or maternal educational attainment when socioeconomic and quality of prenatal care are controlled [29, 33, 65], adverse effects on mothering have been consistently documented elsewhere. For example, cross sectional studies comparing adolescent and older mothers have reported less competent mother-infant interaction, social support, and

home environment quality among adolescent mothers [9, 23-26, 60]. Although one investigator described the adolescent mother as more affectionate toward her infant [24], she is generally depicted as self-centered, punitive, and unsuited to the mothering role [32, 66]. Adolescent mothers are reported to have less knowledge about child development [59, 67], less positive mother-infant interaction [25-28], cognitive stimulation in the home [29, 30], and a greater tendency toward child abuse [47, 66, 68].

The few published longitudinal studies consistently document cognitive, behavioral, and emotional deficits among children of adolescent mothers which span from infancy to adolescence. Infants of adolescent mothers have displayed lower cognitive ability as measured with the Bayley Scales at both 8 [29] and 12 months [30] and lower scores on the speech items of the Denver Parent Questionnaire [31] compared with infants of older mothers. Socioemotional effects evident in the pre-schooler include greater aggression, activity, and poorer impulse control [31-33] while cognitive effects included lower Caldwell Pre-school Inventory [64] and English Picture Vocabulary Test scores [34]. Reported effects of adolescent mothering on adolescent children include higher rates of grade failure, misbehavior, and early sexual activity [31, 32, 64].

Despite the accumulation of negative findings for adolescent mothers and their children, comparative studies fail to determine whether age is a causal factor. Age was a strong factor in several studies where less optimal development was detected among infants of adolescent mothers after controlling race, income, and marital status [24, 28, 30, 34, 69, 70]. However, the influence of age on mothering competence is difficult to

isolate because it is often confounded with marital status, income, education, and race [9, 23, 25, 26, 60] which vary with age and may strongly influence mothering practices and subsequent child outcomes. Therefore, it remains a mystery which specific characteristics of adolescent mothers related to age and/or their situation contribute to the less optimal mothering behavior and child developmental outcomes.

Although the adolescent birth rate in Canada remains high and stable, there have been few studies of the effects of adolescent mothering on Canadian children. In 1990 the overall Canadian adolescent fertility rate was 26.6 and Manitoba's rate was 42.4 per 1,000 which is higher than most other provincial rates [71]. Although there are wide variations in adolescent fertility rates among the regions of Manitoba and between Native and Caucasian females, many adolescent females continue to become mothers during adolescence. In Winnipeg alone 642 infants were born to adolescent mothers in 1990 [71]. Canadian studies are essential because adolescent mothering is common and most studies to date have been done in the U.S. with black adolescents in poverty situations and findings don't necessarily generalize to Canada.

## Measurement of Maternal Competence

Although theoretical work on maternal role competence began during the 1960's and nursing practice embraced the construct, researchers only began to measure PMC during the past decade. Initial studies in maternal role competence were exploratory, descriptive field studies that sought to describe the phenomenon and its processes [10]. Researchers first measured PMC indirectly using instruments which measured related

concepts such as anxiety. For example, Mercer combined five existing scales to create an index of maternal role attainment [16] and Brouse studied maternal role transition [13] with two related instruments. Brouse hypothesized that anxiety is an indirect measure of maternal competence because the competent mother would not experience high anxiety in mothering. Flagler also used two subscales of a related scale which measures the mother's ability to read her infant's cues and respond and maternal anxiety related to childrearing [14].

Most of the first generation PMC scales were developed by maternal/child nurse researchers during the late 1980's and are self-reported Likert ratings of perceived confidence or competence in performing the maternal role [18-21, 52, 72, 73]. Several scales used the semantic differential approach which involved rating bipolar adjectives in determining the mother's rating of herself as a mother [12, 14]. While some of the scales were developed thoroughly with great attention to psychometric goals of reliability and validity, others appeared to be developed quickly for the particular research study.

Most of the PMC scales were developed within the theoretical perspective of maternal role competence theory and defined PMC conceptually as the mother's self-assessment of her adaptation to the maternal role (Appendix A: [12-16, 19-21]). Several PMC scale developers relied more heavily on the tenets of coping, problem-solving [17, 18], and social learning theories [22] but the operational definitions are similar overall. Many operational definitions developed due to the broad nature of maternal role competence theory and the specific interpretations and views of

the researchers. Some of the scales, their theoretical underpinnings (if demonstrated), and operational definitions are described in Appendix A.

**Evidence for Reliability of PMC**

Internal consistency alpha coefficients reported for PMC scales ranged from 0.33 for a subscale of the What Being the Parent of a New Baby is Like (WPL; [72]) to 0.99 for the Preparedness for Infant Care scale [20]. However, most internal consistencies range between .70 and 0.95 suggesting consistent measurement [14, 15, 19, 21, 22, 42, 72, 74].

Several four-week test-retest reliabilities reported for PMC scales have ranged from 0.52 [12] to 0.85 [14, 21]. Lower test-retest stability is expected if PMC is measured among primiparous mothers during the early postpartum period because there is an increase or change in infant care confidence which contributes to lower temporal stability. This phenomenon of increasing PMC may have affected the lower test-retest correlations reported by Secco (.70) and Walker *et al.*, (.55 - .63) who assessed PMC levels of both primiparous and multiparous mothers during early infancy [74]. The test-retest correlations for the semantic differential scale (SD-Self) were moderately low for primiparous mothers (r = .35; p < 01) and even lower and insignificant for multiparous mothers (r = .07; [12]).

**Evidence for Validity of PMC**

Convergent validity for PMC is evidenced in significant, moderate relationships with other measured variables such as infant temperament [22, 52], depression [21, 22], and social support [22]. Construct validity is supported by detection of

theoretically-predicted differences between groups [75] such as mothers with different levels of infant care experience (*i.e.*, primiparous versus multiparous), lengths of time mothering, risk status, and mothers of premature and full-term infants. Several research studies reported higher maternal identity [14] and PMC levels for experienced, multiparous mothers compared with primiparous mothers [72, 74]. A trend of higher PMC scores with ratings of infant care experience was also mentioned by one researcher [74]. One study which failed to find PMC differences between multiparous and primiparous mothers reported significantly higher maternal identity for multiparous mothers [12]. Significant PMC differences have been documented between depressed and nondepressed mothers [22], mothers of full-term and prematurely born infants [42], and abusive and nonabusive mothers [54].

Construct validity is also shown in comparisons of PMC scores and the trajectory of PMC scores over time for both primiparous and multiparous mothers. Several researchers have shown that PMC scores increases with time in the role [50, 51] and are higher and more stable for multiparous mothers [12, 41, 51, 74]. Although primiparous mothers usually show greater increases in PMC during the early postpartum period, they do not achieve the same peak score as the multiparous mother [12, 74]. One study [51] failed to display the typical trajectory of increase for multiparous mothers although the inexperienced, primiparous mothers did follow the trajectory. Also noteworthy was the finding that although primiparous mothers displayed the typical trajectory, the range of increase was very narrow (only about four mean points over 8 months) and multiparous

mothers failed to demonstrate any score increase over four measures during the first eight months after the infant's birth.

Criterion concurrent validity correlations between PMC scales ranged between 0.37 and 0.67. For example, the semantic differential (SD-self) correlated significantly with the Pharis Self-Confidence scale (r = 0.37) [12], the Parent Problem Solving (PPS) correlated significantly with the What Being the Parent of a New Baby is Like (WPL; r = 0.44; [72]), and the investigator's earlier version of the ICQ correlated significantly with the Maternal Confidence Scale (r = .67; [74]). Evidence for criterion validity is shown in significant correlations between PMC and PerMC such as observer ratings of performed interaction competence during a teaching session (r=.33; p<.05) and reports of feeding problems (r=-.35; p<.05) [41]. In one study, the moderate relationship between PMC and PerMC during mother-infant interaction (r=.47; p<.001) was maintained even when social support, depression, and difficult infant behavior were controlled with multiple regression techniques [22]. The only investigation of the relationship between PMC and PerMC during mother-infant interaction for adolescent mothers [76] failed to achieve significance but the sample size (N=20) was small, the PMC measure lacked temporal stability, and the investigators did not report inter-rater reliability for the measure of PerMC (*i.e.*, NCAFS; Nursing Child Assessment Feeding Scale [77]). Some of the NCAFS subscale means were much higher for this small sample of adolescent mothers than the normative data reported by Barnard [78].

Although one group of PMC researchers aptly pointed out that the practical and theoretical importance of PMC lies in its links with mothering behavior quality and child

development outcomes [12] or its predictive validity, few researchers have examined these relationships. One investigation of the link between PMC, maternal identity, PerMC, and child development revealed a moderate relationship between maternal identity and child social competence and behavior problems at nine years of age [79]. However, despite the fact that relationships made theoretical sense, neither PMC nor PerMC were shown to significantly predict child social competence [79]. As suggested by these authors, consideration of differences in social support and intervening child events would have helped because of the time span of 9 years and loss of 36% of the original sample to follow up [79].

Issues related to the measurement of PMC and PerMC may have also contributed to the weak findings because the measure of PerMC (mother-infant interaction) suffered from low median inter-rater reliability (.7) and the PMC scale may have assessed only a small part of the total construct of PMC [79] or confidence in carrying out basic infant care tasks. Although not commented on by the authors, correlations reported for the two time points revealed moderate test-retest stability for the PMC scale (r = .55 for multiparous mother; r = .63 for primiparous mothers) and low PMC score stability for the multiparous mothers. Also PMC was significantly correlated with mother-infant interaction only at one time point and for just primiparous mothers (r= .37; p<.001). With the evidence pointing out the lack of stability of measurement with time and weak relationships between PMC and the criterion of mother-infant interaction behavior, it was difficult to achieve a significant relationship between PMC and child social competence nine years later.

In summary, PMC appears to be a central, psychosocial variable related with other maternal competence variables such as level of social support, depression, and self-esteem. Although theoretical evidence for a relationship between PMC and PerMC exists, the only study which tested the role of PMC in predicting child development suffered methodological difficulties related to measurement of PMC. While there are numerous PMC scales available, few have the psychometric characteristics necessary to assess the predictive relationship between PMC and PerMC. The two PMC scales developed by the investigator, the ICEQ and the ICQ [74], have been exposed to rigorous preliminary validation procedures and appear to be excellent candidates to assess the predictive relationship between PMC and PerMC.

## II. OBJECTIVE

The aim of this doctoral project is to establish psychometric characteristics for two PMC scales developed by the researcher and to set the stage for a follow-up longitudinal study to determine the utility of PMC in predicting later mothering in the home, child development, and parenting stress. The demographic, psychosocial, and social support characteristics of a convenience sample of 60 primiparous, adolescent mothers are described and relationships between these characteristics and PMC levels are explored. Psychometric characteristics, including construct and concurrent validity, are established for the two PMC scales. The theoretical and operational definitions of reliability and validity used in this study are outlined in Figure 2. Construct validity was assessed by: a) examining changes in PMC with time in the mothering role and b) comparing mean PMC scores of younger (less than 17 years old) and older (equal to and greater than 17 years) adolescent mothers. Reliability features of the PMC scales, at both scale and item levels, are determined using item analysis.

## Hypotheses and Predictions

### Predictions: Reliability

*The Infant Care Expectation (ICEQ) and the Infant Care Questionnaires (ICQ; [74]) will each have an internal consistency reliability of at least .8 at each measurement.*

*The ICEQ and ICQ [74]) mean scores will have a three week test-retest temporal stability Pearson correlation of .6 or greater.*

*All of the ICEQ and ICQ item-total score correlations will be positive.*

### Hypotheses and Prediction: Construct and Concurrent Validity

*Hypothesis I: Construct Validity: Time:*

*The PMC scores will increase significantly with time from the prenatal to four week postpartum scores demonstrated with Repeated Measures Analysis of Variance (level of significance set at .05).*

*Hypothesis II: Construct Validity: Age:*

*The young (14-16 years) and older (17-19 years) adolescent groups will show significant differences in PMC scores demonstrated with Repeated Measures Analysis of Variance (level of significance set at .05).*

*Prediction: Concurrent Validity:*

*The Pearson correlation between the ICQ and the Maternal Self-Report Inventory (MSI) both measured at four weeks postpartum will be strong (r=.7 or stronger).*

## Study Definitions of Reliability and Validity

| Theoretical | Operational |
|---|---|
| **Reliability** | |

**SCALE**
reproducibility, consistency, stability of measurement [80, 81]

**Cronbach Alpha Coefficient**

stability of scores with time [75]

**test-retest correlation** between scores at two times

**ITEMS**
internally consistency - extent to which all scale items measure the same construct, i.e., homogeneity [80]

**item-deletion Cronbach alpha coefficients** and **item-total score correlations**

| **Validity** | |

**ITEMS**
**Content validity** relevance of scale items in measuring the scale construct [82, 83] comprehensively [81]

**inter-rater agreement** of relevance among experts

**SCALE**
**Criterion validity** - correlation of study scale with another scale considered a 'gold standard' [80].
**concurrent** - measured at the same point in time
**predictive** - assessed at a later point in time

Most conceptual and abstract measures have no 'gold standard' and researchers must rely on construct validation procedures [81].

**SCALE**
**construct validity** - a process of collecting evidence that indicates the scale measures a specific construct [80, 81]

predicted changes in scores with time, differences between groups, and/or relationships with other theoretically related variables

Figure 2

# III. METHODS

## Instruments

The **Infant Care Questionnaire** (ICQ; [73]), a 28 item five-point Likert scale, measures perceptions of infant care competence during the first 6 weeks of infancy. Mothers rate their knowledge, feelings of frustration, and skill ability in providing infant physical and interactional care on a five point scale from 'strongly agree' to 'strongly disagree'. Six of the ICQ items are negatively worded and are reversed scored, the highest possible score on the total scale is 140.

The first version of the ICQ, then titled the 'Maternal Competence Questionnaire (MCQ)', was developed during the investigator's master's degree research with mothers and premature infants [73] because there was no appropriate measure available at that time. Psychometric properties for the MCQ were established with a sample of mothers 18 years and older (N=164) who gave birth to healthy, full-term infants. The scale displayed a high internal consistency (Cronbach alpha=.92), temporal stability (2 week test-retest Pearson correlation=0.7), concurrent validity with the Maternal Confidence Scale (r=0.6; [19]), and detected PMC differences between primiparous and multiparous mothers [74].

During the current doctoral program, the MCQ was further revised and content validated through a four step process involving expert mothers and published PMC researchers. The first step occurred during an assignment for a health measurement course when two expert mothers rated whether the MCQ items assessed PMC, defined as the mother's infant care ability. Both mothers independently agreed that items related

to the quality of infant behavior and temperament should be excluded as they depend more on the infant's personality than the mother's infant care competence. The process resulted in the deletion of 18 items related to infant behavior and development (*E.g.*, *My baby smiles when I talk with him/her*). The title of the scale was changed from the Maternal Competence Questionnaire (MCQ) to the 'Infant Care Questionnaire' (ICQ) to reflect both the qualitative change in the items and the specific area of maternal competence that the scale addresses.

During the second step of content validation, the shorter scale version (ICQ; 20 items) was sent to a PMC researcher who developed and published several parenting instruments [84]. The expert rated, on a 4-point scale, the relevance of each item in measuring infant care competence: 1 = 'not relevant', 2 = 'unable to assess without revision', 3 = 'relevant but needs minor revision', and 4 = 'very relevant, succinct'. Fifteen of the items (75%) were rated as very relevant and succinct and the other 5 items (25%) as were rated as relevant but needing minor revision. Minor revisions were provided and 4 new items were suggested to comprehensively assess PMC (*e.g.*, 'I can help my baby fall asleep when he/she is tired').

During the third step of the content validation two more published PMC experts [85, 86] rated the ICQ items (now 24) with the same relevance scale and the result was an inter-rater agreement of .95. The final step was the addition of four more items (*e.g.*, *'I am able to take my baby's temperature'*), after field observations of adolescent mothers and their infants, to increase the likelihood that the ICQ assessed PMC comprehensively.

| | |
|---|---|
| 1. I am confident that I can meet my baby's general needs. | 16. I can usually tell when my baby has had enough breast milk or formula. |
| 2. I know about my baby's needs | 17. I usually feel frustrated when my baby fusses. |
| 3. I understand my baby's needs for food and nutrition. | 18. I can tell by the sound of my baby's cry what he/she needs. |
| 4. I understand my baby's emotional needs. | 19. When my baby is tired or fussy I know what he/she needs. |
| 5. I feel unable to meet my baby's needs. | 20. My baby's facial expression and color show me when he/she is upset. |
| 6. I am confident that I can bath my baby. | |
| 7. I am confident that I can feed my baby. | 21. I can usually soothe my baby when he/she is upset. |
| 8. I can tell when my baby is hungry. | |
| 9. I usually feel frustrated when my baby cries. | 22. I can usually help my baby fall asleep when he/she is tired. |
| 10. My baby usually responds to my care as expected. | 23. As my baby grows and changes, I can usually figure out how to give my baby |
| 11. I can usually tell when my baby is tired. | 24. I can think ahead and be prepared for changes in my baby's care. |
| 12. I usually feel frustrated when I can't satisfy my baby. | 25. I am able to take my baby's temperature. |
| 13. I can usually tell when my baby is finished feeding. | 26. I feel unsure caring for my baby. |
| 14. It is difficult for me to decide what my baby needs when he/she cries. | 27. My baby responds positively to my care. |
| 15. I know several ways to help my baby relax. | 28. I feel well prepared to care for my baby. |

Figure 3: Infant Care Questionnaire Items

The **Infant Care Expectations Questionnaire (ICEQ)** is a 30 item scale developed during doctoral studies to measure prenatal perceptions of expected infant care competence. As such, it is the first PMC scale to the author's knowledge that is specifically designed for the prenatal period. The ICEQ contains items very similar to

the ICQ with the introductory phrase 'I expect that I will be able to ...'. The ICEQ has two items different from the ICQ rating amount of '...past experience caring for small babies' and '...knowing who to ask for help if there are questions about infant care needs'. There are five negatively stated items which are reverse scored and the total possible score is 150. This study will establish the first psychometric properties for the prenatally administered ICEQ.

The **Maternal Self-Report Inventory** short form (MSI; Appendix B; [41]) consists of 26 items and five dimensions: Caretaking ability, General Ability as a Mother, Acceptance of Baby, Expected Relationship with Infant, and Feelings During Pregnancy, Labor, and Delivery. Mothers rate statements like 'I think that I will be a good mother' on a 5-point scale from 'completely false' to 'completely true'. The MSI was significantly correlated with actual mothering behavior as reflected in a significant correlation with the Disbrow Interactive Score ($r = 0.33$) and reliability estimates have ranged from 0.66 to 0.89 [41]. For the present study the Cronbach alpha coefficient was 0.81.

The **Rosenberg Self-Esteem Scale** (RSE; Appendix B) is a ten item, 4-point Likert-scaled instrument with satisfactory coefficients of reproducibility (92%) and Scalability (72%) [87]. Respondents select a response from Agree to Strongly Disagree on items such as 'On the whole, I am satisfied with myself'. The scores range from 0 to 40 with higher scores reflecting greater self-esteem. The RSE has been used in many studies looking at the role of self-esteem as a mediator variable [58], an outcome [88], and as a predictor of perceived maternal competence [16, 51]. Internal consistency

Cronbach alpha coefficients for the RSE have ranged from .82 to .85 [50] in a study with high and low risk mothers and from 0.84 to 0.9 with experienced and inexperienced mothers [51].

**Beck Depression Inventory (BDI**; [89]) is a self-report scale using 21 clinically derived, 4-point ordered items ranging from 0 to 3. The items are consistent with attitudes and symptoms of depression [90]. A low score on the BDI reflects absence of depression and the four clinical categories include: a) minimal (0 - 9), b) mild (10 - 16), c) moderate (17 - 29), and d) severe (30 - 63) depression [91]. The scale is designed to assess severity of depression in adolescents and adults and is probably the most widely accepted measure of depression intensity [91]. Internal consistency reports for the BDI have ranged between .79 to .90 for depressed individuals [91] and the Cronbach alpha coefficient for this sample of adolescent mothers is .79. The BDI has been used in several studies examining the role of depression in mothering both for older and adolescent mothers [55].

**Perceived Social Support from Family (PSS-Fa) and Friends (PSS-Fr;** Appendix B) are two similar 20-item scales designed to measure an individual's perception that his/her needs for support, information, and feedback are being fulfilled by family and friends [92]. Responses include 'yes', 'no', and 'don't know' to questions such as 'My friends give me the moral support I need' and 'My family enjoys hearing about what I think'. Several researchers have reported difficulties with the response category of 'don't know' in that, if the interviewer probes for an answer, there may be a forced choice response which is not necessarily a correct reflection of the responder's

opinion. Internal consistency reliability reported for the scales range have been satisfactory (.88 - .90) and the PSS-Fa correlated significantly with depression (r=-.43) while the PSS-Fa correlated significantly with lack of confidence (r=-.43) [92]. For the current study, the internal consistency Cronbach alpha coefficient was .82 for the PSSFr and 0.91 for the PSSFa.

Enacted social support was measured with the **Inventory of Socially Supportive Behaviors (ISSB;** Appendix B), a 40-item self-report measure which assesses the frequency of various forms of assistance (i.e., enacted support or support mobilization) during the previous month [93]. This scale was specifically developed through content analysis of interviews with pregnant adolescents [94] and has been used in studies with pregnant adolescents [95]. The frequency of specific helping behaviors are rated on a scale ranging from '1' (not at all ) to "5" (almost every day). Internal consistency for the ISSB has been above .90 and test-retest is reported 0.88 over a 2-day period and from .63 to .80 over a one-month period [93]. For the current study, the internal consistency Cronbach alpha coefficient was 0.91.

## Recruitment Procedure

After receipt of written ethical (Appendix C) and site approval healthy, pregnant adolescents less than 20 years of age, living in Winnipeg, and able to read and speak English were recruited from three ambulatory care obstetric clinics of two teaching hospitals in Winnipeg. One of the clinics was strictly for adolescents less than 18 years, another for adults 18 years and over, and another for adolescents less than 20 years of

age. On intake, interested adolescents and their guardian (when available) were provided a verbal and written study explanation and signed a consent form (Appendix D). The adolescent was informed that participation was voluntary and may result in no benefit to her or her infant although findings may help professionals better understand adolescent mothers and their infants. The investigator recruited from these sites by regularly attending the clinics two and one-half days a week (all day Tuesday, Thursday, and Wednesday afternoons). The researcher kept track of deliveries through contact with the clinics; a telephone number of a friend or relative was collected when possible to help maintain contact with subjects in the study. Over a 16 month period, a convenience sample of sixty primiparous adolescent mothers less than 20 years of age were recruited.

**Exclusion Criteria**

Adolescents with known psychiatric problems, plans to relinquish, confinement in jail, drinking, drug, and/or developmental problems were not approached for the study. Mothers who deliver prematurely (less than 37 weeks gestational age) were also excluded from the study.

## Data Collection

Data were collected at three time points: during the last trimester (usually recruitment time) and during the first and fourth weeks postpartum (Figure 4). The prenatal intake and demographic forms (Appendix E) were completed in the clinic usually at the time the adolescent agreed to join the study. The one week postpartum form (ICQ) was given to the adolescent at intake so she could complete the form during

the first week after the baby's birth and mail it to the investigator in the provided self-addressed and stamped envelope. The investigator phoned the adolescent after the birth to remind her to complete and mail the ICQ form. The investigator helped the adolescent complete the four week postpartum forms in the home unless the adolescent was scheduled to attend clinic that week.

## Data Collection Times

| | Prenatal | Postpartum | |
|---|---|---|---|
| | 28 - 40 weeks | one week | four weeks |
| **Variable:** | | | |
| | ICEQ | ICQ | ICQ |
| | RSE | | ISSB |
| | PssFa | | MSI |
| | PssFr | | BDI |
| | Demog | | |

Figure 4

ICEQ - Infant Care Expectations Questionnaire  
ICQ - Infant Care Questionnaire  
RSE - Rosenberg Self-Esteem  
PssFa - Perceived Social Support from Family  
BDI - Beck Depression Inventory  

Demog. - Demographic Data  
ISSB - Inventory of Socially Supportive Behaviors  
MSI - Maternal Self Report Inventory  
PssFr - Perceived Social Support from Friends  

## Analysis

Data analysis was conducted in consultation with a qualified statistician from the Biostatistical Consulting Unit, Community Health Sciences Department, University of Manitoba. The Number Cruncher Statistical System (NCSS; [96]) was used for the descriptive, psychometric, and comparison analyses. Descriptive data analyses were run to determine means, medians, standard deviations, distribution qualities, and

correlations. Cross tabulations summarize race, income, education, and other demographic characteristics of the adolescent mothers. Pearson correlation coefficient was used to assess bivariate relationships between the continuous variables.

Psychometric characteristics of the two PMC scales were determined using the item analysis feature of the Number Cruncher program. The Cronbach alpha coefficient reflected the internal consistency stability of the PMC scales while the three week test-retest for temporal stability was assessed with the Pearson correlation coefficient. Both the item-total score Pearson correlations and item deletion Cronbach alpha coefficients were used to determine the need for scale refinement. Item deletion criteria included an item-total score correlation less than 0.2 [97] and significant increases in reliability with item deletion [80].

## Construct and Concurrent Validity

Group differences in PMC scores were hypothesized based on adolescent age categories with the younger (less than 17 years) adolescents scoring significantly lower than the older (17 to 19 years) adolescents. Theoretically, the PMC scores are expected to increase with time in the mothering role or the four week postpartum scores should be significantly higher than the prenatal and one week scores. Repeated measures analysis of variance assessed the influence of both age group and time in the mothering role for those adolescent mothers where all three PMC measures were secured. A closer look at the unpaired t-tests highlights the PMC differences between the two adolescent mother age groups. Concurrent validity of the PMC scales was tested with correlations between

the four week ICQ and both the MSI and depression score and between the prenatal ICEQ and social support and self-esteem variables measured at the same time points.

**Form Completion Rate**

One-hundred percent of the intake forms were completed, 71.6% (N=43) of the one week ICQ forms and 78.3% (N=47) of the four week forms were completed. When negotiating for completion of the four week forms, the investigator's first choice was to bring the forms to the adolescent's home and help her complete them. If unable to secure a home visit, the investigator's second choice was to bring the forms to the adolescent's home, explain them, and leave them for completion as soon as possible. In several days, the investigator phoned to determine whether the adolescent needed assistance to complete the forms. Although all the adolescents received the four week forms, not all returned them.

Reasons for not receiving forms included: a) the investigator was unaware of the delivery and didn't remind the adolescent to complete the one week form b) the adolescent didn't complete the form even though reminded c) the adolescent didn't mail or give the forms to the researcher, d) the forms were lost, e) the adolescent could not be reached by phone, f) an event prevented completion of the forms (eg., boyfriend from boot camp visits at Villa Rosa just as the investigator arrived).

# IV. RESULTS

## Sampling Issues

### Representativeness of Sample

An important sampling issue is the extent to which the sample represents the population of adolescent mothers who typically attend prenatal care at the two main teaching hospitals in Winnipeg. Selection biases would limit both the likelihood that the sample represents the larger population and the generalizability of study findings. Selection bias would result if adolescents with certain characteristics were approached more often and/or if those adolescents who chose to participate differed in any important ways from those who declined participation (i.e., self-selection).

To assess representativeness, a four month partial sampling frame was developed at one teaching hospital using index cards which are prepared by clinic staff for each mother on first visit with the facility. Along with other information, the index card documents the name, age, address, and expected date of confinement. All the adolescents attending the adolescent and adult clinics at this site during a four month period were listed to determine whether those adolescents who joined the study differed from those who declined.

Eighty-six 14- to 19-year-olds appeared to meet the study criteria of at least 28 weeks gestation, living in Winnipeg, primiparous (after June, 1996), not suffering from psychiatric illness, and planning to parent (Figure 3). Forty-nine (56.9%) of these adolescents either did not meet the study criteria (for various reasons not reflected on the index card) or were not seen in clinic. Twenty-six (30.2%) of the total number of

adolescents for whom there was an index card were not seen in clinic during the four month time period and were not approached because of a) exceptionally poor prenatal care attendance, b) attendance at another clinic while the investigator was recruiting, and/or c) change in prenatal care to another health care setting after the initial visit (and completion of the index card). Twenty-three (26.7%) of the adolescents did not meet the study criteria due to greater than first parity, being in jail, living outside the city, plans to relinquish or non-guardianship, and/or known substance abuse (these details were not always recorded on the index card). This left a total of 37 adolescents approached in the four month period who met the study criteria (Figure 5).

## Recruitment Details Over a 4 Month Period

| | | |
|---|---|---|
| Number | | |
| 86 | | appeared to meet the study criteria |
| | 23 (26.7%) | did not meet the study criteria |
| | 26 (30%) | never seen in clinic |
| 37 | | actually met the study criteria |
| n = 20 Adolescent Clinic | | n = 17 Adult Clinic |
| Declined | Joined | Declined | Joined |
| 8 | 12 (60%) | 12 | 5 (29.4%) |

Figure 5

During the four month period, of the 37 adolescents who met the study criteria and were approached, 54.1% (n = 20) were approached in the adolescent clinic and 45.9% (n = 17) in the adult clinic (Figure 3). Seventeen (45.9%) adolescents in total

joined the study, five (29.4%) from the adult clinic and 12 (60%) from the adolescent clinic. It was evident that few primiparous 18- or 19-year-olds who lived in the city attended the adult clinic. Several of the older adolescent mothers appeared more 'street wise' and untrusting of the additional attention. For example, one of the 18-year olds approached stated that she '... didn't like people that she didn't know well entering her home' and that she already had so much supervision she '... couldn't even smoke a cigarette without it being documented and reported somewhere.' Therefore, the study sample best represents the younger adolescent mother who may have had a greater perceived need to join the study.

Over the entire recruitment time, twenty-one (35%) adolescents were recruited from the adolescent clinic at the second teaching hospital on Wednesday afternoons. Although recruitment of over one-third of the sample during one-fifth of the total recruiting time may appear adequate, the sample recruited may not be representative because of a noted decline in sample accruement over time. While there were 12 (57.1% of the total) adolescents recruited at this site during the first 5 month period, there were only 5 (23.8%) recruited in the next 5 month period and only 4 (19%) recruited during the final 5 month period. One possible factor contributing to the recruitment decline was a change in primary place of employment for the clinic obstetrician which resulted in a heavier work load for the nurse-midwife. Another factor affecting recruitment at this hospital was a stipulation from Nursing Research that the clinic nurse-midwife approach the adolescent first to determine interest in the study.

This meant that the onus of initial contact was placed on the shoulders of the clinic nurse-midwife.

In conclusion, although he study sample is most representative of younger (15 - 17 years) rather than older (18 - 19 years) adolescent mothers who attended prenatal care in the core area at one of the teaching hospitals, it is questionable whether the sample adequately represents clients at each clinic.

## Description of the Sample

### Race, Marital Status and School Attendance

Thirty-one (51.7%) of the adolescent mother in the sample were Caucasian and 25 (41.6%) were either Native Indian or Metis (Table 1). Thirty-five (58.3%) of the adolescents considered themselves single, 14 (23.3%) reported having a serious relationship with a boyfriend, and 9 (15%) reported being in a common law relationship while 2 (3.3%) were married.

| TABLE 1: Adolescent Mothers' Characteristics | | n | % |
|---|---|---|---|
| Race of Mother | Caucasian | 31 | 51.7 |
| | Native Indian | 14 | 23.3 |
| | Metis | 11 | 18.3 |
| | Other | 4 | 6.7 |
| | TOTAL | 60 | 100 |
| | | | |
| School Attendance | No | 20 | 33.3 |
| | Yes | 37 | 61.7 |
| | Sort Of | 3 | 5 |
| | TOTAL | 60 | 100 |
| | | | |
| Marital Status | Single | 35 | 58.3 |
| | Serious Boyfriend | 14 | 23.3 |
| | Common Law | 9 | 15 |
| | Married | 2 | 3.3 |
| | TOTAL | 60 | 100 |

Thirty-seven (61.7%) of the adolescents reported attending school while 20 (33.3%) did not. The most commonly attended highschool (Table 2) was the Adolescent Parent Center (n=18; 45%) which is designed for mothering adolescents and provides day care until the child is two years old. The next most commonly attended school was Villa Rosa (n=7; 17.5%) which is a residential home designed to prove a safe place for mothers and infants in need. The remainder of the adolescent mothers (n=13; 37.5%) attended various schools mostly in the Winnipeg core area.

| TABLE 2: School Attendance | | |
|---|---|---|
| SCHOOL | n | % |
| Adolescent Parent Center | 18* | 45 |
| Villa Rosa | 7 | 17.5 |
| Other | 13 | 37.5 |
| TOTAL | 38 | 100 |

\* One of the participants reported 'sort of attending'
Adolescent Parent Center

## Age and Education

Some of the age and education characteristics of the sample are shown in Table

3. The average age of the adolescent mothers was 16.65 years with a range from 14 to

19 years; the average age of the fathers is 19.33 years. The average highest grade

completed by the mother was 9.55 and that for the father of the baby was 10.4.

| TABLE 3: Age and Education | | | | |
|---|---|---|---|---|
| | MEAN | St. Dev. | Range | N |
| Age | 16.65 | 1.23 | 14-19 | 60 |
| Mom Grade | 9.55 | 1.23 | 8-12 | 60 |
| FOB Age | 19.33 | 2.52 | 15-27 | 54 |
| FOB Grade | 10.44 | 1.39 | 8-14 | 48 |

Age:        Mother's average age
Mom Grade:  Highest Grade Completed by mother
FOB Age:    Father's average age
FOB Grade:  Highest Grade Completed by Father

## Place of Dwelling and Financial Source

Twenty-four (40%) of the adolescent mothers reported that their parents were the main source of funds for everyday living, 32 (53.3%) reported financial support from either Social Assistance (i.e., 'Welfare'; n=21; 35%) or City of Winnipeg, Child and Family Services (n=11; 18.3%; Table 4). The dwelling place was the parents' home for 33 (55%) of the adolescents while 10 (16.7%) reported living in either Villa Rosa or a group home. Eleven (13.3%) adolescents reported living in their own or their boyfriend's home or apartment.

| TABLE 4: Place of Dwelling And Financial Source | | | |
|---|---|---|---|
| | | n | % |
| Home | Parents | 33 | 55 |
| | Boyfriend | 6 | 10 |
| | Self | 11 | 18.3 |
| | Residential Home | 10 | 16.7 |
| | TOTAL | 60 | 100 |
| | | | |
| Money Source | Parents | 24 | 40 |
| | Boyfriend | 4 | 6.7 |
| | Social Assistance | 21 | 35 |
| | CFS | 11 | 18.3 |
| | Self | 0 | 0 |
| | TOTAL | 60 | 100 |

The younger adolescents more commonly named their parents (60%; n = 18) as the chief source of money for everyday living whereas the older adolescent mothers tended to name Social Assistance (56.7%; n = 17).

## Involvement of the Father and Grandmother of the Baby

The father of the baby provided daily care for 16 (34%) of the infants while 14

(29.8%) fathers provided no care and had no contact with the baby (Table 5). Another

17 (36.2%) of the fathers saw or visited the infant from less than once a week (n=10;

21.3%), twice a week (n=5; 10.6%), to greater than 3 times a week (n=2; 4.3%). The

grandmother of the baby was involved in daily care for 23 (48.9%) of the infants while 6

(12.8%) reported no grandmother involvement with the infant. Eighteen (38.3%) of the

grandmothers saw the baby in varying degrees from less than once a week (n=5; 10.6%),

two times a week (n=3; 6.4%), and greater than 3 times a week (n=10; 21.3%).

| TABLE 5: Involvement of Father and Grandmother of Baby | | |
|---|---|---|
| Father of Baby | n | % |
| None | 14 | 29.8 |
| sees <1 per week | 10 | 21.3 |
| sees 2 per week | 5 | 10.6 |
| sees >3 per week | 2 | 4.3 |
| daily care provider | 16 | 34 |
| TOTAL | 47 | 100 |
| Grandmother | | |
| None | 6 | 12.8 |
| sees <1 per week | 5 | 10.6 |
| sees 2 times/week | 3 | 6.4 |
| sees >3 per week | 10 | 21.3 |
| daily care provider | 23 | 48.9 |
| TOTAL | 47 | 100 |

**Equality of Groups**

The average age of the adolescent mothers in this study is 16.65 years with a range from 14 to 19 years and a standard deviation of 1.23. The mean age for the older adolescent age group (greater than 16) was 17.6 (Sd=.81) and the mean age for the younger age group (less than 17) was 15.7 years (Sd=.66; T=-10.3; p=.0000). Education level of both the adolescent and her parents was compared at the group level. As expected, the older adolescent mother group had significantly higher educational attainment (10.07 grades completed; Sd=1.30) compared with the younger adolescent mothers (9.03; Sd=.89; T = -3.57; p=.0008). However, the adolescent age groups did not significantly differ in terms of the reported education level of their mother (T=-.86; p=.39) or father (T=.33; p=.74). Although the older adolescent mothers tended to have greater involvement of the father of the baby in infant care, the difference was not significant (Sd=3.48; T=-.41; p=.68). The younger mothers have significantly greater involvement of the grandmother in baby care (mean=5.60; Sd=3.1) compared with the older adolescent mothers (mean=4.04; Sd=2.96; T=1.77; p=.08; one-sided test). This finding was most likely related to younger adolescents living at home where the grandmother assists with infant care either due to school attendance or cultural practice. Source of finances for everyday living varied between the two age groups and reflects the fact that Social Assistance is available for adolescents at least 18 years old. The younger group of adolescent mothers more commonly reported their parents as their chief source of financial support (60%; n = 18) whereas the older adolescent mother

group most frequently reported Social Assistance as the main source of funds (56.7%; n = 17).

## PMC Means by Descriptive Variables

The PMC means were examined by the descriptive variables (i.e., race, school attendance, marital status, place of dwelling, financial source, and involvement of the grandmother and father of the baby) for trends or differences. Comparisons are descriptive and caution is a guideline when drawing any conclusions due to the small number of mothers in some variable groups. None of the group differences were significant using two-sample T tests. However, an overall trend for every variable grouping was an increase in PMC with time in the mothering role.

### PMC Means by Race, School Attendance, and Marital Status

Several descriptive observations can be made about PMC and race, school attendance, and marital status or relationship with the father of the baby (Table 6). The prenatal ICEQ mean was lower for the Metis (119.5) and Native Indian (119.5) compared with Caucasian adolescent mothers and the one and four week postpartum ICQ means were lower for the Metis adolescent mothers than either the Caucasian and Native Indian mothers. The ICQ mean was the same at one week and four weeks postpartum for both the Caucasian and Native Indian adolescent mothers. Overall, the Caucasian adolescents reported higher PMC than either Native Indian or Metis adolescents althouh both Native and Caucasian adolescent mothers achieved the same and higher PMC means at four weeks (129.4).

The prenatal ICEQ and four week ICQ4 were lower for adolescents attending school (120.2) while the one week postpartum ICQ mean was higher for adolescents attending school (126.1). The higher ICQ1 for those adolescent mothers attending school is likely related to the fact that 15 adolescents reported attendance at schools which provide parenting education and child care along with the regular high school curriculum (i.e., Adolescent Parent Center and Villa Rosa). It should also be noted that among those not attending school are some older adolescent mothers who have already completed their high school education.

| Table 6 : Mean PMC Scores by Race, School Attendance, and Marital Status | | |
|---|---|---|
| | ICEQ (n) | ICQ1 (n) | ICQ4 (n) |
| Race | | |
| Caucasian | 124.8 (31) | 125.9 (22) | 129.4 (25) |
| Native Indian | 119.5 (14) | 125.9 (10) | 129.4 (11) |
| Metis | 119.5 (11) | 119.3 (7) | 125.3 (8) |
| Other | 104.5 (4) | 119.1 (3) | 115.3 (3) |
| School Attendance | | |
| No | 123.9 (20) | 123.9 (14) | 128.3 (15) |
| Yes | 120.2 (37) | 126.1 (26) | 127.8 (30) |
| Sort Of | 116 (3) | 109.7 (3) | 124.5 (2) |
| Marital Status | | |
| Single | 120.1 (35) | 124.8 (24) | 127.4 (29) |
| Attached | 122.8 (25) | 126.2 (18) · | 128.3 (18) |

Marital status was compared using two groups: those who reported being single and those who reported some form of attachment with the father of the baby (i.e., serious boyfriend, marriage, or common law). Although PMC means were higher at all three times for adolescent mothers reporting an attachment with the father of the baby, none of these differences were significant with two sample T testing.

**PMC Means by Place of Dwelling and Money Source**

The mean ICQ4 scores were lower for adolescents living in either their boyfriend's home (125) or a residential homes (126.1) compared with adolescents living either on their own (132) or with their parents (127.9; Table 7). The highest PMC mean was among the adolescent mothers who reported living in their own home or apartment (132).

| Table 7: PMC Scores by Adolescent Mother's Home and Money Source | | | |
|---|---|---|---|
| · | ICEQ (n) | ICQ1 (n) | ICQ4 (n) |
| **Home** | | | |
| Parents | 120.1 (33) | 122.9 (23) | 127.9 (25) |
| Boyfriend | 119.7 (6) | 120.5 (6) | 125 (6) |
| Own | 123.1 (11) | 127.1 (7) | 132 (7) |
| Residential Home | 123.9 (10) | 128.7 (7) | 126.1 (9) |
| **Money Source** | | | |
| Parents | 122.9 (24) | 124.8 (16) | 126.7 (18) |
| Boyfriend | 124.8 (4) | 117.5 (4) | 127.5 (4) |
| Social Assist. | 121.3 (21) | 125.2 (15) | 128.5 (15) |
| Child & Family S. | 116.2 (11) | 124.8 (8) | 128.7 (10) |

PMC scores were quite similar regardless of whether the were receiving money from parents, social assistance, and Child and Family Services (Table 7). Although the numbers are small, those adolescents who reported a boyfriend as the main source of money had a relatively high prenatal ICEQ mean (124.8) followed by a dip in the one week postpartum ICQ mean (117.5) and a ICQ4 mean (127.5) approximately the same as the other money source groups.

**PMC Means by Involvement of the Baby's Father and Grandmother**

The prenatal ICEQ scores appeared to increase with degree of involvement of the father of the baby (Table 8). The ICEQ mean was lowest for adolescents with no involvement of the father (120.5), higher for adolescents with some involvement with the father of the baby (122.4), and highest where the father is a daily care provider (124.5; Table 8). The ICQ1 mean was higher for the adolescents with some (126) or no (126.7) contact with the father of the baby compared with daily care by the father (122.5). At four weeks after birth, the ICQ4 is the same for adolescent mothers with daily and no involvement of the father in infant care (128.6) and slightly lower for some father contact (126.3).

| Table 8: PMC Scores by Father and Grandmother Involvement in Infant Care | | |
|---|---|---|
| ICEQ (n) | ICQ1 (n) | ICQ4 (n) |
| Father | | |
| None 120.5 (14) | 126.7 (10) | 128.6 (14) |
| Some 122.4 (17) | 126 (14) | 126.3 (17) |
| Daily 124.5 (16) | 122.5 (14) | 128.6 (16) |
| Grandmother | | |
| None 128 (6) | 125.4 (5) | 131 (5) |
| Some 122.5 (18) | 124.8 (16) | 127.6 (19) |
| Daily 121.7 (23) | 124.8 (17) | 127.2 (23) |

Adolescent mothers with no involvement of the grandmother in infant care scored higher each time (128; 125.4; 131) than when the grandmother provided daily infant care (121.7; 124.8; 127.2; Table 8). Adolescents with daily involvement of the grandmother in infant care are likely younger and grandmother provision of care may adversely affect the adolescent's maternal competence perceptions. However, due to the small number of cases where the grandmother has no involvement, it is probably best to compare 'some' with 'daily' contact means which were very similar at each measurement time.

## Item Means: Differences Between Age Groups

The PMC item means for the two age groups which differed by at least .25 (absolute value) were tested with two sample T tests (Table 9). The only prenatal ICEQ mean item higher for the younger adolescent mother group was item 1 which assessed amount of experience with small babies. The older adolescent mothers scored more favorably on five ICEQ item means including feeling prepared for infant care (item 17), understanding infant nutritional (item 3: T=22.11; Sd=.80; p=.02) and emotional (item 4) needs, feeling frustrated if she can't satisfy her baby (item 6), and feeling that the baby will respond positively to her care (item 22). It is interesting to note that although the younger adolescents reported greater experience with small infants, the older adolescents reported feeling more prepared for infant care and scored higher on some of the infant care items.

The older adolescent mothers scored better on eight of the one week postpartum ICQ1 item means, two of which were also higher on the prenatal assessment:

understanding emotional needs (item 4) and feeling prepared for infant care (item 28).
The older mothers also scored better on being able to bath (item 6), feed (item 7), and
soothe (item 21) the baby; feeling frustrated when the baby cries (item 9) and baby
responds to care as expected (item 10; T=-2.18; Sd=.56; p=.02). The younger
adolescent mothers scored higher on three ICQ1 item means: being able to tell when the
baby is finished feeding (item 13; T=2.27; SD=.24; p=.01), when the baby has had
enough breast milk or formula (16: T=1.82; p=.04), and deciding what baby needs when
he/she cries (item 14).

| Item | ICEQ | Older | Younger | Mean Diff. |
|---|---|---|---|---|
| | **Table 9:PMC Mean Items that Differed by at least 0.25 For the Younger and Older Adolescents** | | | |
| 1 | ... experience caring for small babies | 3.93 | 4.2 | -0.27 |
| 3 | ... understand nutritional needs | 4.33 | 3.8 | 0.53* |
| 4 | ... understand emotional needs | 4.33 | 3.93 | 0.4 |
| 6 | ... frustrated if can't satisfy baby | 2.8 | 2.53 | 0.27 |
| 17 | ... feel well prepared for baby care | 4.53 | 4.27 | 0.25 |
| 22 | ... baby respond positively to my care | 4.47 | 4.23 | 0.34 |
| | **ICQ1** | | | |
| 4 | ... understand emotional needs | 4.7 | 4.26 | 0.43 |
| 6 | ...I can bath baby | 4.61 | 4.26 | 0.35 |
| 7 | ...I can feed baby | 5 | 4.73 | 0.27 |
| 9 | ...frustrated when baby cries | 4.13 | 3.74 | 0.39 |
| 10 | ... baby responds to care as expected | 4.69 | 4.05 | 0.64* |
| 13 | ... can tell when finished feeding | 4.52 | 4.95 | -0.43* |
| 14 | ... difficult to decide what baby needs when cries | 4 | 4.26 | -0.26 |
| 16 | ... tell when had enough milk/formula | 4.57 | 4.84 | -0.27* |
| 21 | ... soothe baby when upset | 4.74 | 4.42 | 0.32 |
| 25 | ... I can take my baby's temperature | 4.3 | 4 | 0.3 |
| 28 | ... feel well prepared to care for baby | 4.91 | 4.63 | 0.28 |
| | **ICQ4** | | | |
| 2 | ... know about baby needs | 4.83 | 4.52 | 0.32* |
| 4 | ... understand emotional needs | 4.78 | 4.48 | 0.28 |
| 10 | ... baby responds to care as expected | 4.74 | 4.28 | 0.51** |
| 12 | ... frustrated when can't satisfy | 3.3 | 3.88 | -0.61* |
| 14 | ... difficult to decide what baby needs when cries | 4.3 | 3.88 | 0.48 |
| 21 | ... soothe baby when upset | 4.78 | 4.52 | 0.28 |
| 25 | ...can take baby's temperature | 4.69 | 4.36 | 0.30* |

\* $p < .05$

\*\*$p < .005$

Of all the <u>four week postpartum</u> ICQ4 item means only one favored younger adolescent mothers: feeling frustrated if unable to satisfy the baby (item 12; T=-2.7; Sd=.44; p=.005). Six item means were at least 0.25 higher for the older mothers including three which were also higher at one week postpartum: understanding emotional needs (item 4) being able to soothe the upset baby (item 21), and baby responds to care as expected (item 10; T=-2.7; Sd=.44; p=.005). The older adolescents also had higher means on items related to knowing about baby needs (item 2; T=-1.94; Sd=.38; p=.03), being able to take the baby's temperature (item 25; T=-1.75; Sd=.62; p=.04), and difficulty in knowing what the baby needs when he/she cries (item 14).

In summary, the older adolescent mothers reported feeling more prepared for infant care at two of the measurement times even though the younger mothers had more experience with small babies. The older adolescents' item means were consistently higher on the same items (i.e., one item mean was higher for three measurements and three were higher twice) and they scored higher on more items at each measurement time.

## Continuous Variables: Mean Differences Between Age Groups

Analysis of the continuous variable mean score differences between the two age groups was performed using unpaired, two sample t-tests (Table 10). Only the scores on perceived social support from friends significantly differed between the two groups (T=-2.73; p=.008) with the younger adolescent mothers (i.e., less than 17 years) reporting significantly lower perceived support from friends than the older mothers (17 years and greater). This finding combined with the lower reported perceived social

support from their family indicates that older adolescent mothers rely more on friends for support while younger adolescent mothers tend to live at home and receive family support. While the self-esteem means of the two age groups was essentially equal, the younger adolescent mothers scored higher, though not significantly, on the depression scale and enacted social support (ISSB). The older adolescent mothers scored higher, though not significantly on maternal self-esteem.

TABLE 10: Continuous Variables:
Mean Differences Between Age Groups

|  | < 17 years | n | | >or = 17 | n | T |
|------|------|------|------|------|------|------|
| PssFa | 12.5 | 30 | 10.8 | 30 | | 1.04 |
| PssFr | 11.3 | 30 | 14.2 | 30 | | -2.73* |
| RSE | 30.3 | 30 | 29.8 | 30 | | 0.45 |
| BDI | 11.8 | 24 | 10.4 | 24 | | 0.53 |
| ISSB | 107.7 | 23 | 103.9 | 24 | | 0.48 |
| MSI | 109.3 | 24 | 112.5 | 23 | | -0.62 |

*p=.008

## Scores on Continuous Variables

At the group level, the PMC scores showed an increase with time from the prenatal ICEQ (mean = 121.2), to the first (mean = 125.4) and fourth (mean = 127.8) week postpartum (Table 11). At both the prenatal and four weeks postpartum, the PMC

scores followed a normal distribution as assessed with the D'Agostino-Pearson Omnibus K² Normality Test. To achieve a normal distribution for the ICQ1 scores, the data for one low scoring outlier (ICQ1=76) was removed and statistical analyses were run without the outlier data.

TABLE 11: Continuous Variable Scores

| Scale | N | Mean | Confidence Limits | Std.Dev | Range | K² (normality) |
|-------|---|------|-------------------|---------|-------|----------------|
| *ICEQ* | 60 | 121.2 | 117.3 - 125.1 | 15.1 | 81-144 | Yes |
| *ICQ1* | 42 | 125.4 | 122.1 - 128.2 | 10.7 | 104 - 140 | Yes |
| *ICQ4* | 47 | 127.8 | 125.2 - 130.3 | 8.7 | 109 - 140 | Yes |
| | | | | | | |
| *MSI* | 47 | 110.9 | 107.7 - 114.0 | 10.4 | 82 - 127 | Yes |
| | | | | | | |
| *PSSFA* | 60 | 11.65 | 10.1 - 13.2 | 6.1 | 0-20 | |
| *PSSFR* | 60 | 12.75 | 11.3 - 13.9 | 4.3 | 0-20 | Yes |
| | | | | | | |
| *RSE* | 60 | 30.1 | 28.8 - 31.3 | 4.8 | 19-40 | Yes |
| | | | | | | |
| *ISSB* | 47 | 105.7 | 99.2 - 112.3 | 22.4 | 65 - 150 | Yes |
| | | | | | | |
| *BDI* | 47 | 11.7 | 9.4 - 13.9 | 7.7 | 1 - 34 | No |

The mean Maternal Self-Report Inventory (MSI) score at four weeks postpartum was 110.9. The mean self-esteem score for the adolescent mothers, as measured with the Rosenberg Self-Esteem Inventory, was 30.1 out of a highest possible score of 40. The mean perceived social support from family was 11.65 while that from friends was 12.75. The mean Beck Depression score for the adolescent mothers was 11.7 is in the

low range of scores that reflect mild depression (10 - 16) [91]. Most of the adolescent mothers in the current study were not classified as depressed although several high scores in the moderate and severely depressed range increased the depression mean for the entire sample. The mean ISSB score was 105.7 reflecting an overall tendency for the adolescent mothers to receive social support from their social network.

## Bivariate Relationships Between Continuous Variables

PMC scores were significantly related with some of the continuous variables including perceived social support from friends, self-esteem, and maternal self-esteem (Table 12). Self-esteem was significantly related with each measure of PMC including the prenatal ICEQ ($r$=0.34; $p$=0.007), the ICQ at one week ($r$=.41; $p$=.008), and both the ICQ ($r$=.56; $p$=.0000) and MSI ($r$=.37; $p$=.03) at four weeks postpartum. While PMC did not significantly relate with perceived social support from family at any measurement time, it was significantly related with perceived social support from friends at all three times ($r$=.31-.35). Age was not significantly correlated with any PMC measure and was significantly correlated with only one study variable, $i.e.$, PSSFr ($r$=.31; $p$=.01). However, the correlation of age and ICQ4 was significant if the influence of self-esteem was controlled ($r$=.34; $p$=.02).

TABLE 12: Pearson Correlation Coefficients Between Continuous Variables

| | PSSFa | PSSFr | RSE | ISSB | MSI | BDI | Age |
|---|---|---|---|---|---|---|---|
| PSSFa | — | — | — | — | — | — | — |
| PSSFr | 0.21 | — | — | — | — | — | — |
| RSE | 0.32* | 0.31* | — | — | — | — | — |
| ISSB | 0.09 | -0.11 | -0.31* | — | — | — | — |
| MSI | 0.10 | 0.35* | 0.32* | 0.2 | — | — | — |
| BDI | -0.33* | -0.09 | -0.43*** | 0.07 | -0.34* | — | — |
| Age | -0.15 | 0.31* | -0.08 | -0.01 | 0.12 | -0.05 | — |
| ICEQ | 0.18 | 0.35** | 0.34** | -0.21 | 0.2 | 0.03 | -0.02 |
| ICQ1 | -0.00 | 0.31* | 0.41** | -0.15 | 0.39* | -0.14 | -0.22 |
| ICQ4 | 0.02 | 0.32* | 0.56**** | -0.16 | 0.37* | -0.26 | -0.28 |

*p level =.01 - 0.04          ***p level =.002
**p level =.006 - 0.008          ****p level =.0000

Self-esteem was also significantly related with perceived social support from family (r=.32; p=.01) and friends (r=.31; p=.02) while depression was significantly correlated with both self-esteem (r=-.43; p=.002) and perceived social support from family (r=-.33; p=.02).

## Predictions: Reliability

### Internal Consistency

The predictions about the internal consistency reliability of the perceived maternal competence (PMC) questionnaires were tested using item analysis. The reliability reports reveal an internal consistency Cronbach Alpha of .91 for the prenatal Infant Care Expectation Questionnaire (ICEQ; Table 13) and .89 for the one week Infant Care Questionnaire (ICQ; Table 14) and .88 for the four week ICQ (Table 15). The

strong internal consistency alpha coefficients indicate that together all the PMC items address a similar, global construct.

The consistency of the scales was further underscored by the item-total score correlations and the item-deletion Cronbach alphas. The item-total score correlations were all positive and low enough at the three measurement times (i.e., none greater than 0.8) to indicate that the individual items are not redundant questions which would falsely raise the scale internal consistency. At the same time, the item deletions correlations were strong enough to indicate that the items were measuring the same construct. Overall, the item deletion Cronbach alpha coefficients are satisfactory with none of the ICEQ or ICQ4 items and three of the ICQ1 items (items 12, 14, and 17) lowering the total scale alpha coefficient slightly (Table 12:14). At this point, none of the items will be deleted because the internal consistency is high for both PMC scales and virtually all of the item-total score correlations are satisfactory. Additional refinement of the PMC scales may be necessary after further analysis during the larger outcome study.

Table 13: Reliability Statistics for the Prenatal ICEQ

| Item | Mean | Standard Dev. | Item Deletion | |
| --- | --- | --- | --- | --- |
| | | | Coefficient Alpha | Correlation with Total Score |
| 1 | 4.07 | 0.97 | 0.9 | 0.58 |
| 2 | 3.87 | 0.91 | 0.9 | 0.6 |
| 3 | 4.08 | 1.01 | 0.9 | 0.54 |
| 4 | 4.13 | 0.96 | 0.9 | 0.57 |
| 5 | 4.63 | 0.84 | 0.91 | 0.35 |
| 6 | 2.67 | 1.11 | 0.91 | 0.27 |
| 7 | 4.52 | 0.77 | 0.9 | 0.58 |
| 8 | 4.07 | 0.95 | 0.9 | 0.59 |
| 9 | 4.08 | 1 | 0.9 | 0.7 |
| 10 | 3.08 | 1.12 | 0.91 | 0.45 |
| 11 | 3.62 | 1.11 | 0.9 | 0.59 |
| 12 | 3.58 | 1.27 | 0.91 | 0.38 |
| 13 | 4.27 | 0.88 | 0.91 | 0.48 |
| 14 | 4.15 | 0.95 | 0.9 | 0.61 |
| 15 | 4.43 | 0.72 | 0.91 | 0.49 |
| 16 | 3.78 | 1.25 | 0.91 | 0.5 |
| 17 | 4.4 | 0.85 | 0.9 | 0.59 |
| 18 | 4.6 | 0.62 | 0.91 | 0.43 |
| 19 | 4.23 | 0.87 | 0.91 | 0.45 |
| 20 | 3.15 | 1.29 | 0.91 | 0.43 |
| 21 | 3.91 | 1.31 | 0.91 | 0.55 |
| 22 | 4.3 | 0.83 | 0.91 | 0.46 |
| 23 | 4.3 | 0.68 | 0.91 | 0.52 |
| 24 | 3.4 | 1.22 | 0.91 | 0.32 |
| 25 | 3.9 | 0.97 | 0.91 | 0.45 |
| 26 | 4.37 | 0.8 | 0.91 | 0.46 |
| 27 | 4.17 | 0.72 | 0.9 | 0.63 |
| 28 | 4.17 | 0.89 | 0.91 | 0.46 |
| 29 | 4.65 | 0.55 | 0.91 | 0.51 |
| 30 | 4.57 | 0.72 | 0.91 | 0.09 |
| Total | 121.2 | | 0.91 | |

0.91 Std Cronbach Alpha

Table 14: Reliability Statistics for the ICQ at One Week Postpartum

| Item | Mean | Standard Dev. | Item Deletion | |
|---|---|---|---|---|
| | | | Coefficient Alpha | Correlation with Total Score |
| 1 | 4.66 | 0.66 | 0.89 | 0.57 |
| 2 | 4.68 | 0.61 | 0.89 | 0.55 |
| 3 | 4.83 | 0.54 | 0.89 | 0.43 |
| 4 | 4.56 | 0.71 | 0.88 | 0.62 |
| 5 | 4.59 | 0.77 | 0.88 | 0.65 |
| 6 | 4.54 | 0.92 | 0.89 | 0.46 |
| 7 | 4.9 | 0.49 | 0.89 | 0.25 |
| 8 | 4.71 | 0.68 | 0.88 | 0.6 |
| 9 | 4 | 1 | 0.89 | 0.51 |
| 10 | 4.44 | 0.81 | 0.89 | 0.47 |
| 11 | 4.63 | 0.7 | 0.88 | 0.4 |
| 12 | 3.51 | 1.27 | 0.89 | 0.24 |
| 13 | 4.71 | 0.6 | 0.88 | 0.41 |
| 14 | 4.17 | 0.95 | 0.89 | 0.2 |
| 15 | 4.32 | 0.85 | 0.88 | 0.38 |
| 16 | 4.71 | 0.56 | 0.89 | 0.57 |
| 17 | 3.78 | 1.17 | 0.89 | 0.32 |
| 18 | 4 | 1.07 | 0.89 | 0.41 |
| 19 | 4.2 | 0.75 | 0.88 | 0.6 |
| 20 | 4.59 | 0.55 | 0.89 | 0.61 |
| 21 | 4.66 | 0.57 | 0.89 | 0.54 |
| 22 | 4.73 | 0.63 | 0.89 | 0.49 |
| 23 | 4.51 | 0.68 | 0.88 | 0.61 |
| 24 | 4.49 | 0.71 | 0.88 | 0.68 |
| 25 | 4.24 | 0.89 | 0.89 | 0.52 |
| 26 | 4.68 | 0.57 | 0.89 | 0.49 |
| 27 | 4.73 | 0.5 | 0.89 | 0.43 |
| 28 | 4.83 | 0.44 | 0.89 | 0.36 |
| Total | 125.4 | | 0.89 | |

0.91 Std Cronbach Alpha

Table 15: Reliability Statistics for the ICQ at Four Weeks Postpartum

| Item | Mean | Standard Dev. | Item Deletion | |
| | | | Coefficient Alpha | Correlation with Total Score |
| --- | --- | --- | --- | --- |
| 1 | 4.8 | 0.4 | 0.87 | 0.67 |
| 2 | 4.67 | 0.64 | 0.87 | 0.51 |
| 3 | 4.8 | 0.4 | 0.87 | 0.59 |
| 4 | 4.64 | 0.61 | 0.87 | 0.6 |
| 5 | 4.78 | 0.47 | 0.87 | 0.52 |
| 6 | 4.84 | 0.47 | 0.87 | 0.36 |
| 7 | 4.98 | 0.15 | 0.88 | 0.24 |
| 8 | 4.93 | 0.25 | 0.87 | 0.47 |
| 9 | 3.73 | 0.99 | 0.88 | 0.24 |
| 10 | 4.49 | 0.66 | 0.87 | 0.49 |
| 11 | 4.69 | 0.6 | 0.87 | 0.41 |
| 12 | 3.6 | 1.23 | 0.88 | 0.28 |
| 13 | 4.84 | 0.42 | 0.87 | 0.58 |
| 14 | 4.07 | 1.01 | 0.88 | 0.37 |
| 15 | 4.38 | 0.78 | 0.87 | 0.48 |
| 16 | 4.76 | 0.48 | 0.87 | 0.46 |
| 17 | 3.89 | 0.98 | 0.87 | 0.41 |
| 18 | 4.29 | 0.82 | 0.87 | 0.57 |
| 19 | 4.4 | 0.72 | 0.87 | 0.55 |
| 20 | 4.82 | 0.44 | 0.87 | 0.19 |
| 21 | 4.64 | 0.61 | 0.87 | 0.58 |
| 22 | 4.82 | 0.39 | 0.87 | 0.48 |
| 23 | 4.64 | 0.57 | 0.87 | 0.62 |
| 24 | 4.42 | 0.75 | 0.87 | 0.57 |
| 25 | 4.53 | 0.73 | 0.88 | 0.32 |
| 26 | 4.6 | 0.72 | 0.87 | 0.47 |
| 27 | 4.84 | 0.42 | 0.87 | 0.42 |
| 28 | 4.84 | 0.37 | 0.87 | 0.56 |
| Total | 127.8 | | 0.88 | |

0.90 Std. Cronbach Alpha

## Temporal Stability

For all the sample, the three week test-retest Pearson correlation for the ICQ was

*.69 (N=38; p=.0000)* (Table 16) indicating a high temporal stability but not so high as to

eliminate the possibility of change or increase in PMC scores with time in the mothering

role. If the three week test-retest correlations are examined more microscopically by age

group it reveals a higher test-retest stability for the older adolescents (r=0.8; n= 21;

p=.0000) than for the entire sample and for younger adolescent mothers (r=.54; n=17;

p=.03; Table 15). The older adolescent may more accurately and consistently evaluate

her PMC level and also have less change in her score compared with the younger

adolescent, thus reflecting the difference in temporal stability.

The ICEQ scores correlated moderately with the ICQ scores during actual

mothering at both one (r=.50; N=42; p=.0007) and four (r=.46; N=47; p=.001) weeks

after birth indicating that the ICEQ is a moderately strong prenatal predictor of PMC

during the first month after birth.

TABLE 16: Test-Retest: Temporal Stability
of PMC Scales Using Pearson Correlations*

|  | Whole Sample | | < 17 years | | > = 17 years | |
|  | ICEQ | ICQ1 | ICEQ | ICQ1 | ICEQ | ICQ1 |
|---|---|---|---|---|---|---|
| ICQ1 | 0.50** | —— | 0.52*** | —— | 0.5** | —— |
| ICQ4 | 0.46* | 0.69+++ | 0.47* | 0.54* | 0.46* | 0.8+++ |

* p = .03    + p = .001
** p = .01    ++ p = .0007
*** p = .004    +++ p = .0000

### Restatement of Predictions: Reliability

*The Infant Care Expectation (ICEQ) and the Infant Care Questionnaires (ICQ: [74])
will each have an internal consistency reliability of at least .8 at each measurement
time.*

*The ICEQ and ICQ [74]) mean scores will have a three week test-retest temporal
stability correlation of .6 or greater.*

*All of the ICEQ and ICQ item-total score correlations will be positive.*

## *Conclusion for Predictions: Reliability*

***The prediction of high internal consistency reliability was accepted.***

***The prediction of a temporal stability Pearson correlation of at least 0.6 was
accepted indicating that the scales were stable with time.***

***The prediction of positive item-total score correlations was accepted.***

***Study results related to reliability predictions indicate that the PMC scales meet the***

***basic requirement of any measure, i.e., that they are reliable.***

## Construct Validity

### Comparison for Time in the Mothering Role

The PMC scores for all the adolescent mothers who completed the

questionnaires (*i.e.*, ICEQ, N=60; ICQ1, N=42; ICQ4, N=47) show an overall increase

with time in the mothering role (Figure 6).

**PMC Change with Time**
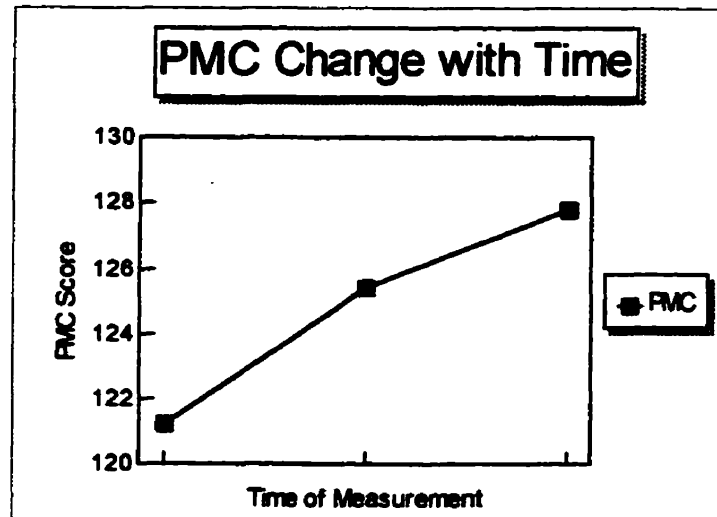
| Means: | Confidence Intervals: | N: |
|---|---|---|
| ICEQ: 121.2 | 117.3 - 125.1 | 60 |
| ICQ1: 125.4 | 122.1 - 128.7 | 42 |
| ICQ4: 127.8 | 125.2 - 130.3 | 47 |

Figure 6

## Comparison Between Age Groups

A closer look at differences in these PMC means (N=60; N=42; N=47) by age group using unpaired t-tests shows that the older age group has a higher PMC mean at each time point (Table 17; Figure 7). Although not statistically significant, the four week postpartum ICQ4 scores reflect the greatest mean difference (3.16) which approached significance (p=-.11).
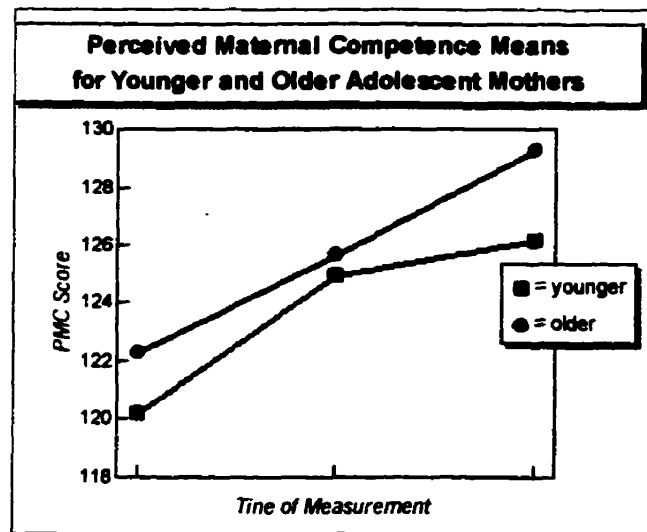
|  | **Younger** | **Older** |
|---|---|---|
| **ICEQ Mean** | 120.2 | 122.3 |
| **Confidence Intervals** | 113.9 - 126.4 | 117.2 - 127.3 |
| **ICQ1 Mean** | 125 | 125.7 |
| **Confidence Intervals** | 120.2 - 129.8 | 120.8 - 130.5 |
| **ICQ4 Mean** | 126.2 | 129.3 |
| **Confidence Intervals** | 122.2 - 130.1 | 125.9 - 132.8 |

Figure 7

The overall increase in PMC scores for the two groups was quite similar with a 6.0 score point increase for the younger and 7.0 increase for the older adolescent mothers. The mean differences between the two age groups were greater at the prenatal (2.1) and four weeks postpartum measures (3.16) with only a small difference at the one week postpartum measure (.67).

TABLE 17: Unpaired T-Tests of Mean PMC Differences Between
Age Groups for The Three Time Points

|      | < 17  | n   | >or =17 | n   | M. Diff. | T Value | p.   |
|------|-------|-----|---------|-----|----------|---------|------|
| ICEQ | 120.2 | 30  | 122.3   | 30  | 2.1      | -0.53   | 0.30 |
| ICQ1 | 125   | 18  | 125.7   | 24  | 0.67     | -0.2    | 0.42 |
| ICQ4 | 126.2 | 23  | 129.3   | 24  | 3.16     | -1.26   | 0.11 |

M. Diff. = Mean PMC Difference

The paired T tests revealed more dramatic mean increases within the three time periods for the older age group (Table 18). While all of the mean increases were significant for the older adolescent mother group, none were significant for the younger group. The younger adolescent mothers may require more time in the role before significant increases are achieved.

TABLE 18: Paired T-Tests of Mean PMC Differences Between Age Groups for the Three Time Intervals

|      |       | < 17 Years | | | >= 17 Years | | | |
|------|-------|-------|---------|---------|-------|-------|---------|---------|
|      |       | Pairs | T value | M. Diff. |       | Pairs | T value | M. Diff. |
| ICEQ | 122.1 |       |         |         | 121.4 |       |         |         |
| ICQ1 | 125   | 18    | -0.95   | -2.94   | 125.7 | 24    | -1.65*  | -4.25   |
|      |       |       |         |         |       |       |         |         |
| ICQ1 | 124.5 |       |         |         | 125.1 |       |         |         |
| ICQ4 | 127.7 | 17    | -1.47   | -3.18   | 129.4 | 21    | -2.64** | 4.2     |
|      |       |       |         |         |       |       |         |         |
| ICEQ | 122.1 |       |         |         | 122.9 |       |         |         |
| ICQ4 | 126.2 | 23    | -1.55   | -4.04   | 129.3 | 24    | -2.95***| 6.4     |

M. Diff. = Mean PMC Difference
*p< .06            ***p=.004
**p=.008

## Hypothesis I: Construct Validity

### Comparison for Time in the Mothering Role

**Repeated measures analysis of variance** revealed significant increases in mean

PMC scores with time in the role for the smaller number of adolescent mothers who

completed all PMC scales at the three measurement times (F=8.09; p=.0007; N=38;

Figure 8).
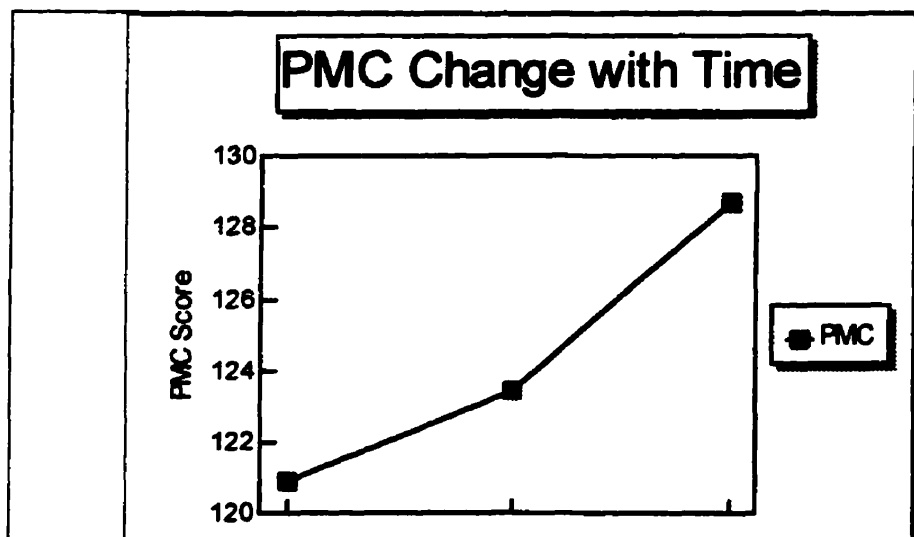


| | Mean | N | Std. Error |
|---|---|---|---|
| ICEQ | 120.9 | 38 | 1.39 |
| ICQ1 | 123.4 | 38 | 1.39 |
| ICQ4 | 128.7 | 38 | 1.39 |

Figure 8

These PMC mean scores also showed a significant increase with time but a different

trajectory of change compared with that calculated previously with all available

adolescent scores included. While the ICEQ mean is quite similar in both instances

(121.2 versus 120.9), the ICQ1 mean is lower (123.4 versus 125.4) and the ICQ4 mean is higher (128.7 versus 127.7) for the adolescent mothers who completed all three forms.

## Hypothesis II: Construct Validity

### Comparison Between Age Groups

**Repeated measures analysis of variance analysis** indicated no significant PMC score differences between the two age groups (F=.28; p=.60;N=38; Figure 9). Overall, the older adolescent mothers scored higher at each measurement time and mean age differences appeared greater for the prenatal ICEQ (3.4) and the ICQ1 (3.0) mean compared compared with that for the ICQ4 mean (*i.e.*, only 0.9). Although the PMC mean was higher for the older adolescent mothers at each time point, the differences appeared to diminish with time in the mothering role.
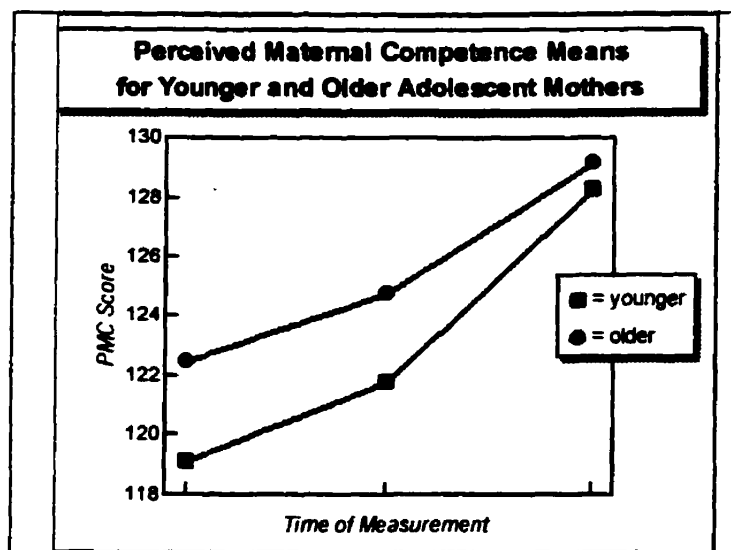
| | Younger | Older | Mean Diff | Std Error |
|---|---|---|---|---|
| ICEQ Mean | 119.1 | 122.5 | 3.4 | 2.02 |
| ICQ1 Mean | 121.8 | 124.8 | 3.0 | 2.02 |
| ICQ4 Mean | 128.3 | 129.2 | 0.9 | 2.02 |

Figure 9

## Prediction: Concurrent Validity

Relationships between the PMC scores and the other continuous variables measured at the same time points are outlined in Table 19. Both Self-esteem ($r=.34$; $p=.007$) and perceived social support from friends ($r=.35$; $p=.006$) correlated significantly with the prenatal PMC score. The correlation between the Beck Depression Scores (BDI) and the four week ICQ scores ($r=-.27$; $p=.06$) approached significance indicating that depression may relate with maternal competence scores for adolescent mothers. Perceived social support from family did not correlate significantly

with the prenatal PMC scores.

Although the concurrent validity correlation between ICQ4 scores and the Maternal Self-Report Inventory was significant (MSI; $r=.37$; $p=.01$), moderate in strength, and the highest concurrent correlation reported in the study, it did not achieve predicted strength.

Table 19: Pearson Correlations Between PMC Scores and
Concurrently Measured Variables

|  | Prenatal ICEQ | Four Weeks Postpartum ICQ4 |
|---|---|---|
| RSE | 0.34** |  |
| PSSFa | 0.18 |  |
| PSSFr | 0.35*** |  |
| ISSB |  | -0.16 |
| MSI |  | 0.37* |
| BDI |  | -0.26 |

*p=.01
***p=.006
**p=.007

**Restatement Hypotheses and Prediction: Construct and Concurrent Validity**

*Hypothesis I: Construct Validity: Time:*

*The PMC scores will increase significantly with time from the prenatal to four week postpartum scores demonstrated with Repeated Measures Analysis of Variance (level of significance set at .05).*

*Hypothesis II: Construct Validity: Age:*

*The young (14-16 years) and older (17-19 years) adolescent groups will demonstrate significant differences in PMC scores demonstrated with Repeated Measures Analysis of Variance (level of significance set at .05).*

*Prediction: Concurrent validity:*

*The Pearson correlation coefficient between the ICQ and the Maternal Self-Report Inventory (MSI) both measured at four weeks postpartum be strong (r=.7 or stronger).*

## Conclusions Hypotheses and Prediction: Construct and Concurrent Validity:

### Hypothesis I: Construct Validity: Time

*The hypothesis of an increase in PMC with time in the mothering role was accepted.*

### Hypothesis II: Construct Validity: Age

*The hypothesis of greater PMC levels for the older adolescent mothers was not accepted because, although there was evidence of age differences, the differences were not significant and they decreased over time*

### Prediction: Concurrent Validity:

*The prediction of a concurrent validity correlation of 0.7 between the ICQ4 and the MSI was not accepted.*

## Multiple Regression: PMC Explanatory Variables

### Multiple regression

Multiple regression analysis was run to determine which prenatal and one week postpartum variables significantly explained PMC at four weeks postpartum. Separate models were run for the social support (PSSFa, PSSFr, ISSB), psychosocial (BDI and RSE), and sociodemographic (education, father and grandmother involvement in care, age) and only self-esteem was significant.

The following model was tested with ICEQ, or expectations of perceived maternal competence, perceived social support from friends, self-esteem, and age as the independent explanatory variables and ICQ4 as the dependent, predicted variable. ICEQ was included to help control for previous experience with infant care which could be a confounder. Age was included in the model because a significant relationship was found between age and ICQ4 when the influence of self-esteem was controlled. PssFr was entered in the model because significant differences were found between the adolescent mother age groups.

ICQ4 scores $= I + b_1 * ICEQ + b_2 PSSFr + b_3 * RSE + b_4 Age$

The resultant model is:

ICQ4 scores $= 79.2 + .20 * ICEQ + .81 * RSE$

Neither age nor PSSFr were significant in the model. The model significantly explained 38.3% ($R^2 = .383$) of the variance in the ICQ4 scores (F=13.67; p=.000) with self-esteem explaining the largest amount of variance ($R^2 = .173$; T=3.47; p=.001) after ICEQ scores (.21; T=2.2; p=.03).

# V.  DISCUSSION

Study results provided strong reliability, temporal stability, and construct validity for the two PMC scales. The PMC scales were shown to be consistent at the scale level, as shown by the high internal consistency alpha coefficients (.89 - .91), and stable with time as shown by the high three week test-retest temporal stability correlation ($r=.69$). Internal consistency was evidenced at the item level by the satisfactory item-deletion Cronbach alpha coefficients and item-total score correlations.

Construct validity was supported by the repeated measures analysis of variance results which indicated that PMC scores increased significantly with time in the mothering role.  However, the trend of higher PMC scores for the older adolescent mothers did not achieve significance in the repeated measures analysis.  Also, although no correlation between age and PMC was significant, when the influence of self-esteem was controlled the correlation between ICQ4 and age was significant ($r=.34$; $p=.02$).  At the item level, older adolescent mothers tended to score higher on more items, and on the same items more often, compared with the younger adolescent mothers.  Significant concurrent validity correlations were found between PMC and both self-esteem ($r=.34$; $p=.007$) and perceived social support from friends ($r=.35$; $p=.006$).

The weakest finding was the lack of predicted strength in the concurrent validity correlation between the ICQ and MSI ($r=.37$; $p=.01$).  Self-esteem emerged as the variable explaining the greatest amount of variance (31%) in the ICQ4 scores explaining a significant amount of variance (17.1%) even after controlling prenatal experience with infant care using the ICEQ.

## Scale Psychometrics for the ICQ and ICEQ

### Stability of Measurement

The PMC scales reflected stability of measurement at both the scale and item levels as shown by the high internal consistency reliabilities (*i.e.*, .88 - .91) and the positive and high item-total score correlations and item-deletions Cronbach alpha coefficients. These internal consistency assessments are higher than those reported for most PMC scales available [14, 15, 19, 21, 22, 42, 72, 74] and indicate that the items most likely measure one construct. Temporal stability of PMC from the first to fourth week postpartum was strongly demonstrated for the whole sample ($r=.69$; $p=.0000$) and for the older ($r=.80$; $p=.0000$) compared with younger ($r=.54$; $p=.03$) adolescent mothers. The temporal stability correlation for the whole sample is comparable with those reported in the literature [12, 14, 21, 74].

The lower temporal stability for the younger mothers may reflect the greater change and learning in infant care among that group. The more psychosocially mature, older adolescent may be a more discriminating rater of PMC level compared with the younger adolescent mother. The high correlation between the ICQ1 and the four week ICQ4 scores reflected the shorter period of time compared with the correlation between the prenatal and one week assessments. The test-retest correlation would likely be even stronger if based on measurements at two time points later in the postpartum period when PMC has stabilized.

**Validity of Measurement**

**Concurrent Validity**

Although the concurrent validity correlation between the MSI and the ICQ measured at four weeks postpartum was similar in strength to those reported in the literature (.37; [12] and .44; [72]), it was much lower than expected (.37; p=.01). A higher concurrent validity (r=.67; [74]) was reported in a study using an older version of the ICQ scale and a very similar criterion scale, the Maternal Confidence Scale [19].

The low concurrent validity correlation is likely related to differences between the two scales in terms of level of item specificity and number of dimensions addressed. While the ICQ concentrates specifically on infant care and interaction, the MSI has items from five areas: general ability and preparedness for the mothering role, caretaking ability, acceptance of the baby, expected relationship with the baby, and feelings during pregnancy, labor, and delivery. The means and item-total score correlations for the four MSI items related to the quality of the labor and delivery experience (*e.g., I found the experience of labor and delivery to be very exciting.*) were among the lowest for the scale. Also, many of the MSI items assess general mothering ability (*e.g., I think that I will be a good mother.'*) compared with the more specific nature of the ICQ (*e.g.. 'I can take my baby's temperature').* A higher concurrent validity estimate may have resulted if a more specific scale which addressed only PMC in infant care had been available for the investigation. In fact, when a shortened version of the scale is formed with only the MSI items from the caretaking ability and general ability and preparedness for mothering dimensions, the concurrent validity correlation increased to .51 (p=.0003) and

the correlations with the ICEQ (r=.34; p=.02) and ICQl (r=.44; p=.006) are then significant.

As McDowell and Newell point out, criterion validity is difficult to establish because there is no 'gold standard' for many abstract concepts and the process of construct validation is more appropriate [81]. The low concurrent validity correlation reflects the complicated nature of measuring an abstract construct as shown also in the research related to health and social support measurement. A more convincing form of concurrent validity involves determination of a relationship between the abstract scale (in this case the PMC scales) and an observable, agreed-upon criterion of performed mothering competence such as observed mothering behavior and/or infant developmental level.

Concurrent validity was supported by several correlations with theoretically-related variables such as self-esteem, depression, and social support. The significant relationship between the prenatal PMC measure (ICEQ) and self-esteem (RSE; r=.34; p=.007) is consistent with past theoretical [41] and empirical findings for various groups of mothers [50, 51]. The significant relationship found between PMC and perceived social support from friends (r=.35; p=.006) is consistent with other studies with both older [22, 41] and adolescent mothers [23, 55] and reflects the importance of friends in this developmental stage of life. The finding that social support provided by family was not significantly related with PMC may indicate that many of these adolescents must survive despite low family support or that family support has a more indirect effect on PMC through its role in shaping another variable such as self-esteem.

This may also reflect one of the normal developmental challenges of the adolescent period, i.e., to separate and become independent from their families. The finding that the correlation between PMC and depression approached significance in the predicted direction (r=-.27; p=.06) is consistent with studies which reported significant PMC differences between depressed and nondepressed mothers [22] and significant relationships between depression and various measures of PMC [22, 55].

**Construct Validity**

Construct validity for PMC was provided by the comparisons of PMC means of the two age groups and by examining the changes in PMC with time in the mothering role. The repeated measures analysis of variance revealed significant differences among the three PMC means for time in the mothering role (F=8.09; p=.0007) but not for age (F=.28; p=.60). Increases in PMC level with time in the role have been consistently reported in studies with older mothers [12, 41, 50, 51, 74]. In fact, PMC scores followed a consistent overall trajectory of increase with time from the early postpartum measure to five weeks [74], 4 to 6 months [12] and eight months [50, 51]. Three investigations showed a significant main effect with time from early to later postpartum [12, 50, 51] and two studies reported significantly greater increases for primiparous mothers [12, 51]. The present study is the first to document the same trajectory of PMC increase among adolescent mothers during the early postpartum period.

Although age was not a significant variable in the repeated measures analysis of variance, construct validity was evidenced by trends in PMC differences for older and younger adolescent mothers. As a group, the older adolescent mothers had higher PMC

mean scores at each measurement time and the mean PMC score for the older adolescent mother group approached significance at the four week measure (T=-1.11; p=.11; N=47) where the mean difference between the age groups was 3.16. The relationship between age and PMC was further underscored by the finding that the relationship between ICQ4 and age reached significance when the influence of self-esteem was controlled (r=.28; p=.05). The results and plot of PMC means at the three time points including only the adolescent mothers who had completed all three PMC questionnaires (Figure 9) provided a slightly different perspective. Although the older mothers scored higher at each time, the PMC mean differences between the age groups decreased over time. By the fourth week postpartum there was relatively little PMC mean difference (0.9) suggesting an experience effect rather than age. It is possible that time and experience caring for the baby during the first four weeks postpartum increased PMC level regardless of maternal age.

In summary, the PMC scales appear to be reliable and valid measures of PMC appropriate for use during the prenatal and early postpartum periods. Stability of measurement was underscored by the high internal consistency Cronbach alpha coefficients at the three measurement points and the very high three week temporal stability correlation. The lower temporal stability correlation for the younger adolescent mother group indicates that the scale may more appropriately be administered later in the infancy period when PMC self-evaluations have stabilized.

The hallmark construct validity findings were a) the significant increase in PMC scores with time in the role for all the adolescent mothers and b) the trend of greater

PMC scores for the older adolescent mothers in spite of the small age difference between the two groups. For the entire sample of adolescent mothers, the PMC scores followed a learning curve of increase in competence with time performing an activity or role. When the age distribution of the sample is examined, 56.7% (n=17) of the older adolescent mothers were 17 years old and 66.7% (n=20) of the younger group were 16 years old. With an average age of 15.7 years for the younger group and 17.6 years for the older group, the statistical comparison was essentially between 16 and 17 year old adolescent mothers. With this in mind, the finding that the four week PMC scores approached significance was probably clinically, although not statistically, significant.

## Recommendations for Future PMC Measurement

### Selection of an Appropriate Scale

Selection of the most appropriate PMC scale for a research project involves consideration of numerous theoretical and measurement differences among the scales. Scales differ in terms of the psychometric criteria of validity and reliability, stage of development or sophistication, and performance in past studies. A scale developed based on applied psychometric theory is more likely to display reliability and validity. Researchers selecting a scale should also consider whether the scale matches the study purpose and is appropriate for the particular measurement time and type of sample.

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┌─────────────────────────────────────────────────┐
│                                                 │
│           Early Scale Development               │
│                                                 │
│            Face and content validity            │
│             Inter-rater agreement               │
│                  Pilot testing                  │
│              Item revision process              │
│─────────────────────────────────────────────────│
│                                                 │
│                 Initial Study                   │
│                                                 │
│     Internal consistency at scale and item levels│
│                Temporal stability               │
│           Criterion validity with similar scale │
│    Construct validity - differences with groups or time│
│─────────────────────────────────────────────────│
│                                                 │
│               Subsequent Studies                │
│                                                 │
│            Additional construct validity        │
│             Consistency of multiple studies     │
│                 Predictive validity             │
│       Determine true value of scale and construct│
│                                                 │
└─────────────────────────────────────────────────┘
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Figure 10: Guidelines for Evaluation of Reliability and Validity for
each Stage of Scale Development

Psychometric qualities to consider when selecting a scale are outlined within the perspective of the stage of development or sophistication (Figure 8). Reports on the early stage of scale development should include an item revision process based on theoretical and/or empirical methods. Theoretical avenues for content validation include having mothers and published PMC experts evaluate the items and provide feedback regarding addition of new items or revision and/or deletion of present items [82]. A possible empirical approach would be the calculation of inter-rater agreement

between and among experts on the rating of item appropriateness and/or degree of construct coverage [83, 98]. In the early stage of scale development, pilot testing among mothers in a particular target group can determine readability, ease of completion, and appropriateness of scale length [80].

A scale report should minimally report at lease one type of content validity, test-retest stability, internal consistency reliability, and criterion or construct validity [99]. Scales should be selected that have an internal consistency Cronbach alpha of at least .85 and a test-retest correlation of at least .65 for a homogeneous sample of mothers. A lower test-retest correlation is acceptable if calculated with a heterogeneous group of mothers during the early postpartum period when PMC is undergoing rapid development. Statistical item analysis could have been used to revise the scale items and items are deleted if item-total scale correlations are low (less than .2) or scale Cronbach alpha coefficient increases significantly with item deletion [80]. This empirical process increases the internal consistency and validity of the scale by increasing the likelihood that it addresses a specific construct. The initial scale study should also provide evidence of construct validity, *i.e.*, that PMC scores measured with the particular scale follow predicted theoretical trends with time or between groups. Although not all initial reports provide evidence of construct validity, subsequent studies should establish firm evidence for measurement of the particular construct.

The numerous, subtle theoretical differences among PMC scales should be considered when selecting an instrument for a particular research project. These differences are related to the scale scope and construct breadth, appropriate time of

administration, and the likelihood of assessing change (Figure 9). The PMC scale may have a general, broad scope [41, 53, 72, 100], a specific focus on some aspect of infant care [19, 20, 22, 74, 101], or a combination of general and specific items [41, 72]. An example of a broad item is: 'I think that I will be a good mother' [41] compared with the more specific item: 'I am able to take my baby's temperature' (ICQ; Secco). Although the availability of various scales provides the freedom to assess PMC from many perspectives, there is a tendency for researchers to overlook the differences when interpreting study results.

Scales also differ in their breadth or number of constructs addressed, some scales address only PMC [19, 20, 22, 74, 101], other just maternal identity [53], and still others both PMC and maternal identity [21, 41, 72, 100]. To complicate matters even more, some of the scales address PMC, maternal identity, and some less related factor such as the delivery experience [41] or satisfaction with parenting [72, 100]. The number and type of scale constructs relates directly with the psychometric and measurement features of a scale. A scale which addresses maternal identity, with broad construct items, is more likely to reflect greater temporal stability, lower groups differences and/or little change with time or intervention. On the other hand, a specific PMC scale would more likely detect change, treatment effect, and differences between groups.

| Scale | Scope | Breadth | Time | Change | Reference |
|-------|-------|---------|------|--------|-----------|
| ICEQ | S | PMC | PR | strong | |
| ICQ | S | PMC | P/I | strong | [74] |
| MSI | B | PMC, MI, O | A | moderate | [41] |
| MCS | S | PMC | P/I | strong | [19] |
| PSCS | S | PMC | P/I | strong | [101] |
| PICQ | S | PMC | P/I | moderate | [20] |
| SD-Self | B | MI | A | moderate | [53] |
| PSOC | B | PMC, MI, O | A | Moderate | [100] |
| TCQ | B | PMC, MI | T | Moderate | [21] |
| MSE | S | PMC | P/I | strong | [22] |
| WPL | B | PMC, MI, O | A | Moderate | [72] |

Figure 11: PMC Scale: Focus, Construct, Time and
Ability to Assess Change

B = broad                          PMC = Perceived Maternal Competence
S = Specific                       MI = Maternal Identity
                                   O = Other Construct

P = Postpartum
A = Any Time Parenting
PR = prenatal

ICEQ  - Infant Care Expectation Questionnaire    PSOC  - Parent Sense of Competence Scale
ICQ   - Infant Care Questionnaire                        SD-Self- Myself as Mother
MSI   - Maternal Self Report Inventory           MCS   - Maternal Confidence Scale
PSCS  - Pharis Self-Confidence Scale             PICQ  - Parent Infant Care Questionnaire

TCQ  - Toddler Care Questionnaire
MSE  - Maternal Self-Efficacy
WPL  - What Being the Parent of a New Baby is Like

Although a scale addressing two or more constructs usually displays lower

internal consistency reliability than a one-construct scale, the combination of PMC and

maternal identity appears to maintain high reliability. For example, the MSI has a

relatively high internal consistency (approximately .82) despite the fact that it is a

multi-construct scale. This stability effect is due to the a) close theoretical relationship

between maternal identity and PMC and b) more stable nature of maternal identity which changes little after becoming a mother. While addition of maternal identity to a PMC scale may not lower the internal consistency appreciably, it can decrease the validity of the scale. Maternal identity acts as a stabilizer to dampen the oscillations in PMC which normally occur as a woman becomes a mother. Consequently, data collected with a combination scale or a maternal identity only scale are less likely to show a strong correlation with another PMC scale (concurrent validity), differences between predicted groups (construct validity), and the typical trajectory of increase with time in the mothering role (construct validity).

One must also consider time because some scales are appropriate for the infancy period [19, 20, 22, 74, 101], one for the toddler period [21], and others for almost any time during parenting [12, 100]. Time of PMC scale administration will affect level of PMC and measurement of change because PMC tends to be lower during the early postpartum period and to increase with time and infant care experience [12, 50, 51, 53, 74]. Although PMC likely fluctuates during times of developmental challenge or stress, it likely achieves some stability after the first 4 to 6 months as a mother. Consequently, greater temporal stability and predictive validity would likely be achieved if PMC is measured later in the postpartum period.

In summary, the PMC instrument selected for a particular project should ideally match the study purpose, theoretical construct, and sample characteristics and also have excellent psychometric credentials. The scale's psychometric and construct features should be thoroughly assessed to increase the likelihood of valid measurement inference.

The scale should display measurement sophistication including high internal consistency, temporal stability, and concurrent and construct validity. The fit between the scale and the study theoretical construct should be displayed at the item level. When measuring treatment effect, differences between groups, and/or change with time one should select a specific scale with low reported standard deviations and use a homogeneous sample to attain high study power without requiring large sample size.

## Factors Associated with Perceived Maternal Competence (PMC)

The study findings partially support Belsky's theory of the importance of psychosocial and social support variables in determining parenting competence, at least PMC for adolescent mothers. Belsky's statements on the paramount importance of psychosocial variables was exemplified in the significant relationships between PMC and self-esteem. In accordance with past mothering studies, self-esteem was the strongest explanatory variable for PMC at four week postpartum. While social support from friends was significantly related with PMC at the bivariate level, the significance of the relationship was lost with multiple regression analysis. The only other significant predictor study variables was the prenatal PMC score which is designed as a control for infant care experience.

Although depression was not significantly correlated with PMC at any measurement time, it was moderately correlated with the concurrent PMC measure (MSI), self-esteem, and perceived social support from family. The relationship between social support and psychosocial factors was also evidenced in the significant

relationships between perceived social support from family and both self-esteem and depression. Perceived social support from friends was significantly related with self-esteem at all three measurement times while enacted social support (ISSB) and perceived social support from family were not significantly related with PMC at any measurement time. Self-esteem was significantly related with both perceived social support from family and enacted social support (ISSB) while depression was significantly related with both perceived social support from family and self-esteem.

## Personal or Psychosocial Characteristics

### Self-Esteem

The strong, explanatory relationship found between self-esteem and PMC is consistent with previous studies and developmental theorists who describe self-esteem and identity formation as a major developmental challenge for the adolescent. For adolescent mothers in this study, prenatal measures of self-esteem explained a significant amount of variance in PMC at four weeks after birth. Mercer reported that self-esteem, or self-concept, was a significant predictor of PMC at one year for adolescent and older mothers of different age groups ($R^2$=16.9%; [16]). With no available PMC scale at the time, Mercer defined PMC within the broad theoretical perspective of maternal role attainment and measured it with an index that combined several subscales from existing related maternal instruments and infant growth indices.

In a later study Mercer used an established PMC instrument and the Rosenberg self-esteem scale [87] to examine the relationship between PMC and maternal risk status for older mothers. PMC was assessed at four times: during the early postpartum period

and at one, four, and eight months after birth. Self-esteem explained significant amounts of variance in PMC for high risk mothers ($R^2$=6% to 34%) at the various times [50]. As expected, the greatest explained variance ($R^2$=34%) was achieved when self-esteem was the first variable entered in the regression equation. Mercer and Ferketich further underscored the relationship between self-esteem and PMC with a subsequent re-analysis of the same data divided by low (primiparous) and high (multiparous) experience in infant care. Self-esteem was a significant explanatory variable for both experienced and inexperienced mothers ($R^2$=8% to 34%) at the various measurement times [51]).

**Depression**

The lack of a significant relationship between depression and PMC ($r$=-.03 to -.26) in the present study is somewhat consistent with the findings that depression played a less significant role, compared with self-esteem, in explaining PMC for mothers of different experience levels and [51] risk status [50]. While depression scores of high risk women significantly explained between 9.5 and 24% of the variance in PMC at one and eight months after birth, depression explained less variance in PMC ($R^2$=6.4%) and was significant only one month postpartum for low risk women [50]. Although depression reached significance as a PMC explanatory variable for experienced mothers (unique $R^2$=.018; p=.045), depression was the weakest variable and was significant only one time out of four. Depression significantly predicted PMC (unique $R^2$=.081; p=.0001) only at one measurement time for less experienced mothers [51].

In contrast, Teti and Gelfand reported a significant, strong relationship between depression and both PMC (r=-.57; p=.001) and PerMC during mother-infant interaction. In fact, these authors described PMC as a mediator between PerMC and other factors including depression, infant difficulty, and social-marital support [22]. Studies reporting significant relationships between PMC and depression had more depressed mothers in their sample compared with the other PMC studies. For example, Hall reported a greater then usual prevalence of depression symptoms among the sample mothers [58], Panzarine *et al.*, purposely divided their sample by level of depression [55], and Teti and Gelfand's study sample was composed of depressed and nondepressed mothers as part of a larger study on depression in mothering [22]. The influence of depression may be more evident in studies where a larger proportion of the mothers suffer from depression which was not the case in either the Mercer or Ferketich study or the present investigation where depression showed a less significant relationship with PMC. Unfortunately, most studies on the role of depression in parenting have been cross sectional, comparative, and descriptive and few causal statements can be made.

### Self-Esteem and Depression

Multiple regression findings from this study are similar to others in the literature and indicate that self-esteem is more strongly related with PMC compared with depression [22, 50, 51]. The significant relationship found in the present study between depression and self-esteem (r=-.43; p=.002) is consistent with reports elsewhere with older mothers. For example, in a study of the mediator effects of self-esteem on depressive symptoms of older mothers, Hall *et al.*, reported a moderate and significant

correlation (r=-.41) and a direct effect of self-esteem on depressive symptoms [58]. A social support intervention study with single mothers in unsupportive relationships reported a strong relationship between self-esteem and depression (r=-.69; p<.05), however the sample size was small (N=14) [102]. Although it is possible that depression has an indirect effect through it relationship with self-esteem, this possibility has not been adequately tested.

## Social Support and PMC

Although none of the six correlations between perceived social support from family (PSSFa) or enacted social support (ISSB) and PMC were significant in the present study, all three correlations between perceived social support from friends and PMC were significant but the significance was lost with multiple regression analysis. Tardy described the social support scales used in this study as measures of received emotional support [103] which means that the adolescent mothers' PMC level was not directly related with receipt of emotional support from their families. The lack any significant relationship between PMC and family support was somewhat surprising in light of the significant, moderate to strong (r=.29 to .71) relationships reported for both older [22, 41, 104, 105] and adolescent mothers [4, 23]. However, several studies with adolescent mothers have reported nonsignificant relationships between family support and PerMC (demonstrated warmth and competence during feeding [106]) or parenting satisfaction at one month after birth [61]. Timing of measurement may also be a factor [107] as shown by the finding that a nonsignificant relationship between family support and parenting satisfaction during the early postpartum became significant later in the

first year of the child's life at 6 and 12 months [61]. It is also possible that the type and amount of support most useful to distressed adolescents changes over time.

The finding that perceived social support from family and from friends were related with different psychosocial variables is aligned with theoretical statements on the distinction between these types of support [92]. This distinction has also been empirically shown in significant correlations between family and friend support and symptoms such as stress and depression [108]. Perceived social support from family and enacted support may be indirectly related with PMC through other maternal psychosocial characteristics such as self-esteem and depression. All three social support variables, perceived social support from family ($r=.32$), friends ($r=.30$), and enacted social support (ISSB; $r=-.31$) were significantly related with self-esteem while social support from family was significantly correlated with depression ($r=-.32$).

The question of whether social support is related to PMC may best be answered with the same reply Barrera offered when asked whether adolescent mothers' adjustment to pregnancy depends on social support - that it depends on how social support is conceptualized and measured [95]. In the case of the adolescent mother, time of measurement also appears important. Although many studies suggest that social support is related to adolescent mothering, causal statements are limited because most study designs have been cross-sectional, descriptive and many different social support definitions and measurement techniques have often produced inconsistent results [62].

For some of the adolescent mothers, the lack of relationship between perceived social support from family and PMC may relate to perceived family rejection or

discipline due to the pregnancy, as many adolescent mothers were living in either a residential home, group home, or foster care. One of the adolescent mothers who was living at home informed the investigator that she no longer received an allowance because '...all the money had to go to providing for her son now'. Family support may also be limited by the fact that in many families there was no father available. Also, many of the adolescents live in the city core area where the high incidence of family problems such as drinking, child neglect, and violence may decrease the quality and quantity of family support available. As suggested by Schellenbach, unstable life situations, stress, and the tendency to relocate frequently may have contributed to the diminished availability of friend and family support [107].

Social support has shown significant relationships with both situational stress and maternal psychosocial variables including depression and self-esteem. In one study, a significant amount of adolescent mothers' emotional stress was explained by social support, self-esteem, and coping style [49]. Stress has been related to social support [93] for older mothers [37] and adolescent mothers [23, 30]. Parks *et al.*, suggested that social support may enhance parenting through its direct and indirect effects on stress [63]. Garcia-Coll *et al.*, reported that adolescent mothers had less child care support and more perceived stress compared with older mothers and that these variables were significantly associated with infant mental development [30].

## Age and PMC

Although one investigator reported a significantly lower PMC level for adolescent mothers compared with older mothers [16], this study provides the first comparison of PMC levels for younger and older adolescent mothers. No significant relationships were found between age and PMC at any of the three measurement times and the only variable significantly correlated with age was perceived social support from friends ($r=.31$; $p=.01$). It is interesting to note that when the influence of self-esteem is controlled, the correlation between ICQ4 and age did achieve significance. PMC differences between the adolescent mother age groups were not significant although the four week scores approached significance ($T=-1.18$; $p=.11$). Also, when divided by age group, paired t-tests were significant ($<.10$) for the older adolescent mothers at all three times and not at any time for the younger group.

The trajectory of PMC change for the two age groups shown with only the adolescents who completed all three PMC scales revealed that mean differences decreased over time. In other words, the effect of age appeared to decrease with the passage of time and perhaps the experience caring for the infant was an equalizer between the two age groups. For although the younger adolescent mothers began with lower prenatal and one week postpartum PMC means, the differences appeared to attenuate by the four week postpartm measure suggesting a less likely effect of age alone.

One interesting, somewhat unexpected finding is the higher PMC scores for adolescent mothers compared with those reported in studies with older mothers. The

adolescent mothers' mean PMC score on the MSI (110.9) was higher than scores reported for mothers of both full term (108) and prematurely born (98) infants [42]. However, the length of time mothering must be considered because the MSI was completed very shortly after birth (2 day after birth) in the McGrath study compared with at 4 weeks postpartum in the present doctoral project. The mean PMC scores in the present study were higher than the one and five week postpartum scores reported for 164 older mothers (both primiparous and multiparous; Figure #) [74]).

|  | Older [74] | Adolescent |
| --- | --- | --- |
| Time | PMC | Present |
| 1 week | 108 | 124 |
| Four |  | 127.8 |
| Five | 121 |  |

A medical student used the ICEQ scale and reported higher prenatal scores among adolescent mothers [109] compared with the postpartum means reported with the older mothers [74]. But the higher PMC levels could be attributed to differences between the earlier scale versions and present content validated scales. The earlier ICEQ and ICQ versions included 18 items rating infant behavior (e.g., My infant smiles when I talk with him/her) which lowered the total score until the infant achieved the particular milestone. For many of these adolescent mothers, becoming a mother was a strong goal which may have clouded their ability to objectively evaluate competence in mothering. An adolescent mother may also feel the need to justify or defend her mothering ability and competence due to a perceived threat of loss of the infant. Several adolescents asked whether the investigation was associated with social work and one

adolescent who withdrew from the study when she read the term 'social worker' on the consent form and did not want to participate if a social worker might be involved.

Small sample size, high PMC standard deviations, and age features of the study sample may gave contributed to the lack of predicted PMC differences by age groups. The mean age (16.65 years) may have been higher if there had been more 18- and 19-year-olds available to recruit and the older group may have then achieved a significantly higher PMC mean. Therefore, further study with a larger sample and more older adolescents is necessary to determine decisively whether PMC differences exist for the two adolescent age groups.

In summary, although psychosocial and social support variables displayed significant bivariate relationships with PMC, self-esteem emerged as the strongest multivariate explanatory psychosocial variable.

## PMC Measurement, Theory, and Relevance

### PMC Measurement

It is probably best to consider test construction an ongoing process that demands continuous reevaluation in the context of both validation research and feedback from researchers who use the scales [110]. Perhaps the most basic requirement to ensure validity of measurement is achievement of a close fit between the theoretical construct and operational definition [81], especially when there is no 'gold standard' criterion. With no 'gold standard' researchers must vigilantly attend to measurement issues and interpret research findings within the context of the scale limitations and strengths.

Researchers should not complacently accept a scale because it has displayed adequate internal consistency and criterion validity because the scale is not necessarily valid for a particular study.

When similar studies fail to produce consistent findings, one must consider the influence of measurement issues and the validity of the construct. For example, while one study reported significant PMC differences between mothers of premature and full-term infants [42], another study failed to find a significant influence of risk status on PMC [50]. A closer look at the scales suggests that the conclusions may have been drawn based on differences between the scales. One study used a scale (MSI) which contained four items rating the experience of labor and delivery which is often more negative for premature compared with term delivery. It's possible that the conclusion of significant difference in PMC levels based on risk status was actually due to differences in the birth experience. The second study was not likely to detect differences in PMC by risk status because a broad scale (PSOC) was used which focused on maternal identity rather than PMC. It's highly possible that the different conclusions about the relationship between risk status and PMC were drawn based on differences in the measurement features of the scales rather than PMC level of the women.

PMC researchers must also begin to consider methods to assess and diminish the effects of measurement bias such as social desirability, 'faking good', social deviation, 'faking bad', and 'halo effect'. Both social desirability, when one unknowingly places one's best foot forward and the intentional version 'faking good' [80], produce a higher than true PMC score. Some adolescent mothers tended to evaluate themselves very

competently despite very negative home and social situations and poor mother-infant interaction quality and content (as observed by the investigator). There may be relationships between stress, the social situation, and PMC which are independent of the individual mother's rating of her PMC. In the other direction, social deviance and 'faking bad' can produce lower PMC scores than their true value as can the 'nay say' approach where the mother scores negatively in the hopes of gaining extra attention or entering an intervention program. A highly possible bias in the present study is the 'halo effect' where judgments on individual aspects of performance are swayed by the overall impression of the person [80]. This is a likely bias because the adolescent mother's maternal identity may be stronger than her ability to evaluate her competence in the individual items of the PMC scale.

Valid measurement of PMC is affected by the lack of distinction between PMC and maternal identity, two constructs which constitute the broad theory of maternal role competence. Clarification of the distinctions between PMC and maternal identity would help researchers determine which constructs various scales assess and select the most appropriate scale for the research purpose. This step would improve the construct validity and credibility of PMC by at least insuring that researchers are assessing PMC and not something else.

Resources should be spent on perfecting the present scales rather than developing new scales. A new scale is needed only when existing scales don't fit the needs of the investigation or when better methods of measurement are initiated. New and practical ways to measure maternal role competence are welcome, for example Zahr

and Cole developed an eight item PerMC rating scale for nurses to rate sensitivity of mother-infant interaction observed in the hospital setting [111]. The hospital ratings were significantly related with mother-infant interaction ratings measured again when the infants were 8 months old. This clinical application provides a unique means to assess PerMC and also bridges gaps among theory, research, and clinical practice. When researchers use a newly developed PMC scale they should also use an established scale so that criterion validity can be assessed.

**PMC Theory**

As one of the few nursing-originated theories, maternal role theory helped nurses change the focus in maternity nursing from one of illness and stress to more positive wellness outcomes such as attainment and competence. These aspects of maternal role theory may have contributed to the speed with which it was applied in clinical practice, teaching, and research. However, despite its rather rapid acceptance and the fact that it has withstood the test of 30 years of time, the true relevance of PMC is yet to be determined.

Another issue related to the fit between PMC theory and measurement scales is whether PMC and maternal role theory were adequately understood before scales were developed. Researchers likely began developing PMC scales before an adequate amount of qualitative, theory development work was done. The preliminary qualitative field work in PMC was difficult to understand due to complex interactionist theory terminology and vague descriptions of research methods. As a result, numerous terms were used to describe maternal role competence such as role attainment, transition,

achievement and a diverse variety of scales were developed to measure PMC. Therefore, it is recommended that PMC researchers use qualitative techniques whenever possible to validate the construct and its measurement. Two important areas for qualitative research endeavors include determination of the meaning and experience of mothering competence from the mother's perspective and content validation of scale items with both published experts and mothers. As demonstrated by Smithbattle in her narrative approach to understanding the adolescent mother's transition to motherhood, we can learn a great deal from listening to the adolescents tell their stories [112]. The qualitative approach and listening to adolescents may be a useful route to explore the distinctions between maternal identity and perceived maternal competence.

## PMC Relevance

The present study described the demographic, psychosocial, and social support characteristics of a group of adolescent mothers, reported numerous relationships supporting Belsky's determinants of parenting competence model, and provided reliability and validity evidence for two PMC scales. Although it was not surprising that self-esteem was the strongest predictor of four week postpartum PMC level, the fact that the PMC scales measured this feature consistently with previous studies, adds construct validity evidence for the PMC scales.

The PMC scales provide two devices to measure a salient maternal psychosocial attribute and a potential means of early identification of mothers at high risk for mothering stress and infant relationship problems. To date, there is no valid means to identify mothers who may require that extra support and attention as they adapt to the

role and demands of mothering. Even the experienced, multiparous mother may feel stress as she experiences the phenomenon of 'forgetting what it was like to care for a newborn'. Mothers with low PMC may then receive the necessary support before problems in the mother-infant relationship or low perceived maternal competence develop. The PMC scales may be useful in identification of mothers in need of Community Health Nurse visits after discharge from the hospital and mothers at high risk for poor mothering behavior or home quality which can result in child developmental deficits.

The PMC scales appear sensitive enough to detect treatment effect in intervention studies such as the effects of televised infant care teaching or programs designed for mother-infant pairs compromized by the stresses of premature birth or a congenital defect. The PMC scales are easy to administer and, if predictive validity is established, may provide an inexpensive research alternative to measuring variables such as mother-infant interaction, cognitive stimulation in the home, and infant development. Early detection of high risk mothers and infants provides an avenue for treatment and prevention of more adverse outcomes which are costly to the health care system, the mother, and child.

In order to determine the relevance of PMC, researchers must look beyond the circular pursuit of explaining relationships between PMC and other variables and quantify the role of PMC in predicting important outcomes. The true value of PMC lies in its ability to predict outcomes such as actual mothering behavior and child development [12]. Therefore, relationships between PMC and later outcomes of infant

development, PerMC or mothering behavior in the home, and parenting stress will be determined in the second part of this longitudinal study.

# APPENDIX A: PMC SCALES

The investigator developed the **Infant Care Questionnaire** (ICQ; [73]), a 28 item five-point Likert scale, measures perceptions of infant care competence during the first 6 weeks of infancy. Mothers rate their knowledge, feelings of frustration, and skill ability in providing infant physical and interactional care on a five-point, Likert scale from 'strongly agree' to 'strongly disagree'. The first version of the ICQ, then titled the 'Maternal Competence Questionnaire (MCQ)', was developed during the investigator's master's degree research with mothers and premature infants [73] because there was no appropriate measure available at that time. Psychometric properties for the MCQ were established in a subsequent study with mothers 18 years and older (N=164) who gave birth to healthy, full-term infants. The scale displayed a high level of internal consistency (Cronbach alpha = .92), temporal stability (2 week test-retest Pearson correlation = 0.7), high concurrent validity (correlation = 0.6) with the Maternal Confidence Scale [19], and detected PMC differences between primiparous and multiparous mothers [74].

The first prenatal PMC scale is the **Infant Care Expectations Questionnaire** (ICEQ) which has 30 items and was developed during doctoral studies and measures prenatal expectations of infant care competence. As such, it is the first PMC scale to the author's knowledge that is specifically designed for the prenatal period. The ICEQ twins the ICQ in that it contains all the items of the ICQ with the introductory phrase 'I expect that I will be able to ...'. The ICEQ contains two items not contained in the ICQ rating amount of '...past experience caring for small babies' and '...feelings of preparedness for

infant care'. This project will be the first to establish psychometric properties for the prenatally administered ICEQ.

The **Maternal Self-Report Inventory** (MSI) short form [41] consists of 26 items and five dimensions: Caretaking ability, General Ability as a Mother, Acceptance of Baby, Expected Relationship with Infant, and Feelings During Pregnancy, Labor, and Delivery. Mothers rate statements like 'I think that I will be a good mother' on a 5-point scale from 'completely false' to 'completely true'. The MSI was significantly correlated with actual mothering behavior as reflected in a significant correlation with the Disbrow Interactive Score (r = 0.33) and reliability estimates have ranged from 0.66 to 0.89 [41].

Golas and Parks [19] developed a 12 item scale, the **Maternal Confidence Scale**, to measure a specific indicator of maternal role competence, confidence 'interpreting newborn behavioral response'. The instrument was developed for a study to measure the effect of a nursing intervention designed to help new mothers learn about newborn infant behavior. The PCS was significantly correlated with another PMC scale (r=.6; [62].

The **Toddler Care Questionnaire** (TCQ) measures perceived maternal confidence in caring for a toddler and, according to its developers, it can be used for focusing nursing interventions for mothers with low levels of confidence in parenting their toddlers [21]. The TCQ has 38 items and the mother rates her confidence, from 'very little' (a) to 'quite a lot' (e), in knowing and managing various aspects of caring for a toddler (eg. Knowing how to make your home safe for your child' or 'Getting your child to bed without a power struggle'). The authors acknowledge that PMC changes with

time and that toddlerhood may represent an especially challenging developmental stage for mothers. Internal consistency of the scale is high (.95) and the TCQ scores were significantly correlated with depression levels of the mothers ($r=-.31$; $p<.03$).

An early competence scale which was published outside nursing was the **Parenting Sense of Competence Scale** (PSOC) developed by Gibaud-Wallston and Wandersman [100]. The PSOC was used in several investigations of mothering behavior and interaction differences between hyperative, abusive, and normal children [54]. It was also used in several recent nursing investigations comparing PMC levels of experienced and inexperienced and high and low risk mothers [50, 51]. The scale has 16 items which are rated on a six-point scale from 'strongly agree' to 'strongly disagree'. This instrument has two subscales (*i.e.*, satisfaction and efficacy) and the scores can be added to give a total PSOC score. An example item: 'I would make a fine model for a new mother to follow in order to learn what she needs to know in order to be a good parent'. Internal consistency Chronbach alphas for the scale have ranged between .82 and .87 [51]. Although several of the items of this scale appear to have been translated and, as a result, are somewhat long and convoluted, the scale appears to be an excellent measure of maternal (and paternal) identity.

Pridham and her colleagues [17, 18, 72, 113, 114] have developed instruments to measure maternal problem-solving competence within the framework of transition to the maternal role. An initial study [72] centered around the development and testing of a scale to measure **what being a new parent of a young baby is like** (WPL). The scale which consisted of 14 items designed to measure four aspects of parental beliefs: a)

centrality of the infant in the parent's life, b) change experienced by the parent, c) satisfaction in being a parent, and d) evaluation of performance as a parent (p. 21). The WPL was administered to new mothers three times during the first three and one-half days birth and two main factors were identified using factor analysis: success in infant care and centrality of the infant on the mother's mind. Another instrument developed by Pridham and colleagues, How Parents Problem-Solve Regarding Infant Care (PPS; [17]) was qualitatively developed based on the diaries of mothers' experiences in the maternal role. Mothers kept logs of experiences for 13 weeks related to six areas: growth and development, temperament, baby care issues, parenting, special events, and behavior.

A scale developed by Rutledge and Pridham to assess the mother's **Preparedness for Infant Care** was further evidence of the continued effort of Pridham and colleagues to assess mothering competence [20]. Although the scale was not given a title, it will be called the Perceived Preparedness for Infant Care Scale (PPIC) for this discussion. Maternal competence was defined as the extent to which the mother perceives herself to be knowledgeable about and capable of accomplishing the tasks of caring for and feeding a newborn. The PCIC scale contained 68 items about feeding and infant care with 6 answer options that ranged from 'not at all adequate' to 'completely adequate'. The scores of all the mothers (N=76) correlated significantly and strongly with an overall self-rating of competence in feeding (r=.58; p<.01) and infant care (r=.55; p<.01).

Walker, Crain and Thompson developed a semantic differential scale, Myself As Mother (SD-Self), comprised of 11 bipolar adjectives to measure the evaluative

component of the dimension **Myself as a Mother** [12] using the semantic differential techniques of Osgood, Suci and Tannenbaum [115]. The mother's evaluation provided an indication of maternal role attainment as a reflection of her self-confidence in the role. The mother reads the 11 bipolar adjectives (*e.g. weak-strong, kind-cruel, good-bad)* and rates herself as a mother on a 7-point scale. The scores are added to provide a maternal self-evaluation score which reflects her maternal identity. Internal consistency values have ranged from .81 to .85 and the scale has correlated with mothering behaviors [12].

The semantic differential technique was also used by Flagler [15] to measure maternal role competence using the concepts **'myself as a mother'** and the **'ideal mother'**. Flagler hoped to be able to subtract the scores on these two measures to obtain the mother's own self-evaluation of maternal competence. Unfortunately, factor analysis identified different dimensions for the two concepts which meant that the scores could not be subtracted. Three new dimensions of maternal competence, joy, difficulty, and investment, were defined which captured the meaning of 'myself as mother' better than those specified in semantic differential theory.

Teti and Gelfeld developed a measure of maternal competence, or what they called self-efficacy, to determine whether behavioral competence of mothers during mother-infant interaction was mediated by **maternal self-efficacy** [22]. It is interesting to note that these scale developers who arise from the area of child development were only aware of the Gibaud-Wallston and Wandersman scale which is also in the child development literature. These authors were totally unaware of the scales developed

within the discipline of nursing. The maternal self-efficacy scale contains 10, 4-point items which address specific areas of infant care such as performing daily routine tasks (*e.g.*, feeding, bathing, and changing the baby), knowing what the baby enjoys, maintaining joint attention and interaction with the baby. The Cronbach alpha for the scale ranged from .79 to .86 and the scale correlated strongly with the Parenting Sense of Competence subscale of the Parenting Stress Index ($r=-.75$; $p<.001$; [116].

| Perceived Maternal Competence Scales, Theory*, Definition |
|---|
| MCS - Maternal Confidence Scale: 12 Likert items; everyday infant care.<br><br>' confidence interpreting newborn infant behavior' [19] |
| PSCS- Pharis Self-Confidence Scale- 13 Likert items, self-confidence in everyday baby care [101].<br>Semantic differential (SD - Self) Scale - Myself as a Mother ;  22 item bipolar, 7          point, bipolar adjectives<br><br>Maternal role theory/ maternal attainment is reflected in confidence in infant care;  maternal identity, ... involves confidently enacting the culturally defined behavior associated with the maternal role' [12] |
| Instrument development study: mothers kept daily logs of experiences in 6 coded categories: a) growth and development; b) temperament, c) baby care issues; d) parenting; e) special events, f) behavior [17].<br><br>Sense of competence related with Coping theory: 'the sense of  competence that mothers believe themselves to have is an outcome of coping responses made to a range of issues over a period of time and a summation of how well they think they dealt with issues'. |
| PICQ- Preparedness for infant care questionnaire, 68 Items related to infant care tasks such as feeding, diapering, cord care, bathing, dressing, meaning of cry, infant safety, play.<br><br>competence for infant care: 'the extent to which a mother perceives herself to be knowledgeable and capable of accomplishing the tasks involved in caring for and feeding a newborn' [20] |
| Instrument Development - SD: **Myself as a Mother and the Ideal Mother**.   Three dimensions: joy, difficulty, and investment<br><br>Sense of adequacy in the maternal role perceived by the woman herself . Role is the interactive, behavioral component, influenced by both the self and role expectation [15] |
| PPSC - Parent Problem Solving Competence.  Mother rates her skill in solving baby care problems, figuring out what is going on, and planning how to deal with a concern.<br><br>transition and self appraisal of problem-solving and parenting issues<br><br>model of transition: maternal personal conditions, situational conditions, problem solving, and self appraisals [18] |

| |
|---|
| **PSOC** - Parenting Sense of Competence Scale - Mother rates competence on 16, six-point Likert items. Two subscales: satisfaction and efficacy.<br><br>Parenting Self-Esteem, Satisfaction and Efficacy; The degree to which the mother feels that she has acquired the skill and understanding necessary to be a good parent and to which the values parenthood and her degree of comfort with this role [100]. |
| **MSI** - Maternal Self-Report Inventory [41]<br>5 dimensions: caretaking ability, general ability as a mother; relationship with baby; acceptance of baby; feelings during pregnancy, labor and delivery<br><br>Self-efficacy ' the value a mother attaches to her ability as a mother .... involves both cognitive and affective components.' [52] |
| **TCQ**- Toddler Confidence Questionnaire, 36 Likert items<br><br>' the mother's perception that she can effectively manage a variety of tasks or situations related to parenting', [21] |
| **MSE** - Maternal Self-Efficacy, 10 items; specific infant care domains: soothing, determining what baby wants, knowing what baby enjoys, performing daily care.<br><br>'judgment of one's ability to perform competently in one's particular task or setting' [22]. |
| **WPL** - What Being the Parent of a New Baby is Like; 14 items; Dimensions: centrality of infant; change; satisfaction with being a parent; evaluation of performance as a parent<br><br>Problem-Solving [72] |
| **ICQ**- Infant Care Questionnaire- 28, Likert items. Knowledge, ability, and confidence in infant care and interaction.<br><br>maternal role competence: 'Perceptions of being able to care for and interact with her infant' [73, 74] |
| **ICEQ** - Infant Care Expectation Questionnaire; 30 Likert items rating infant care experience, preparedness for infant care and the 28 items of the ICQ with the introductory phrase 'I expect that I will be able to ...'<br><br>maternal role competence: 'Expectations of being able to care for and interact with her infant' |

# APPENDIX B: STUDY SCALES

## Perceived Social Support From Friends

Directions: The statements which follow refer to feelings and experiences which occur to most people at one time or another in their relationships with their **friends**. For each statement there are three possible answers: yes, No, Don't know. Please circle the answer you choose for each item.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

| | | |
|---|---|---|
| Yes No Don't know | 1. | My friends give me the moral support I need. |
| Yes No Don't know | 2. | Most other people are closer to their friends than I am. |
| Yes No Don't know | 3. | My friends enjoy hearing about what I think. |
| Yes No Don't know | 4. | Certain friends come to me when they have problems or need advice. |
| Yes No Don't know | 5. | I rely on my friends for emotional support. |
| Yes No Don't know | 6. | If I felt that one or more of my friends were upset with me, I'd just keep it to myself. |
| Yes No Don't know | 7. | I feel that I am on the fringe of my circle of friends. |
| Yes No Don't know | 8. | There is a friend I could go to if I were just feeling down, without feeling funny about it later. |
| Yes No Don't know | 9. | My friends and I are very open about what we think about things. |
| Yes No Don't know | 10. | My friends are sensitive to my personal needs. |
| Yes No Don't know | 11. | My friends come to me for emotional support. |
| Yes No Don't know | 12. | My friends are good about helping me solve problems. |
| Yes No Don't know | 13. | I have a deep sharing relationship with a number of friends. |

Yes  No  Don't know  14. My friends get good ideas about how to do things or make things from me.

Yes  No  Don't know  15. When I confide in friends it makes me feel uncomfortable.

Yes  No  Don't know  16. My friends seek me out for companionship.

Yes  No  Don't know  17. I think that my friends feel that I am good at helping them solve problems.

Yes  No  Don't know  18. I don't have a relationship with a friend that is as intimate as other people's relationships with friends.

Yes  No  Don't know  19. I've recently gotten a good idea about how to do something from a friend.

Yes  No  Don't know  20. I wish my friends were much different.

Perceived Social Support From Family

Directions: The statements which follow refer to feelings and experiences which occur to most people at one time or another in their relationships with their families. For each statement there are three possible answers: yes, No, Don't know. Please circle the answer you choose for each item.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

| | | |
|---|---|---|
| Yes No Don't know | 1. | My family gives me the moral support I need. |
| Yes No Don't know | 2. | I got good ideas about how to do things or make things from my family. |
| Yes No Don't know | 3. | Most other people are closer to their family than I am. |
| Yes No Don't know | 4. | When I confide in the members of my family who are closest to me, I get the feeling that it makes them uncomfortable. |
| Yes No Don't know | 5. | My family enjoy hearing about what I think. |
| Yes No Don't know | 6. | Members of my family share many of my interests. |
| Yes No Don't know | 7. | Certain members of my family come to me when they have problems or need advice. |
| Yes No Don't know | 8. | I rely on my family for emotional support. |
| Yes No Don't know | 9. | There is a member of my family I could go to if I were just feeling down, without feeling funny about it later. |
| Yes No Don't know | 10. | My family and I are very open about what we think about things. |
| Yes No Don't know | 11. | My family is sensitive to my personal needs. |
| Yes No Don't know | 12. | Members of my family come to me for emotional support. |
| Yes No Don't know | 13. | Members of my family are good at helping me solve problems. |

Yes  No  Don't know     14.     I have a deep sharing relationship with a number of members of my family.

Yes  No  Don't know     15.     Members of my family get good ideas about how to do things or make things from me.

Yes  No  Don't know     16.     When I confide in members of my family, it makes me feel uncomfortable.

Yes  No  Don't know     17.     Members of my family seek me out for companionship.

Yes  No  Don't know     18.     I think that my family feels that I am good at helping them solve problems.

Yes  No  Don't know     19.     I don't have a relationship with a member of my family that is as close as other people's relationships with family members.

Yes  No  Don't know     20.     I wish my family was much different.

Rosenberg Self-Esteem Scale

Please respond by circling your response to each of the following questions.

SA = strongly agree       D = disagree
A = agree               SD = strongly disagree

1.    On the whole, I am satisfied
     with myself. ----------------- SA    A    D    SD

2.    At times I think I am no
     good at all. ----------------- SA    A    D    SD

3.    I feel that I have a number
     of good qualities. ------------ SA    A    D    SD

4.    I am able to do things as well
     as most other people. ---------SA    A    D    SD

5.    I feel I do not have much to
     be proud of. ----------------- SA    A    D    SD

6.    I certainly feel useless at
     times. ------------------------- SA    A    D    SD

7.    I feel that I'm a person of
     worth, at least on an equal
     plane with others. ------------ SA    A    D    SD

8.    I wish I could have more
     respect for myself.    ---------SA    A    D    SD

9.    All in all, I am inclined to
     feel that I am a failure. ------ SA    A    D    SD

10.   I take a positive attitude
     toward myself.--------------- SA    A    D    SD

## Inventory of Socially Supportive Behaviors

1. Looked after a family member while you were away.

2. Was right there with you (physically) in a stressful situation.

3. Provided you with a place where you could get away for awhile.

4. Watched after your possessions when you were away (pets, plants, home, apartment, etc.).

5. Told you what he/she did in a situation that was similar to yours.

6. Did some activity with you to help you get your mind off things.

7. Talked with you about some interests of yours.

8. Let you know that you did something well.

9. Went with you to someone who could take action.

10. Told you that you are O.K. just the way you are.

11. Told you that she/he would keep the things that you talk about private _ just between the two of you.

12. Assisted you in setting a goal for yourself.

13. Made it clear what was expected of you.

14. Expressed esteem or respect for a competency or personal quality of yours.

15. Gave you some information on how to do something.

16. Suggested some action that you should take.

17. Gave you over $25.00.

18. Comforted you by showing you some physical affection.

19. Gave you some information to help you understand a situation you were in.

20. Provided you with some transportation.

21. Checked back with you to see if you followed the advice you were given.

22. Gave you under $25.00.

23. Helped you understand why you didn't understand something well.

24. Listened to you talk about your private feelings.

25. Loaned or gave you something (a physical object other than money) that you needed.

26. Agreed that what you wanted to do was right.

27. Said things that made your situation clearer and easier to understand.

28. Told you how he/she felt in a situation that was similar to yours.

29. Let you know that he/she will always be around if you need assistance.

30. Expressed interest and concern in your well-being.

31. Told you that she/he feels very close to you.

32. Told you who you should see for assistance.

33. Told you what to expect in a situation that was about to happen.

34. Loaned you over $25.00.

35. Taught you how to do something.

36. Gave you feedback on how you were doing without saying it was good or bad.

37. Joked and kidded to try and cheer you up.

38. Provided you with a place to stay.

39. Pitched in to help you do something that needed to get done.

40. Loaned you under $25.00.

# Maternal Self-Report Inventory

CF= Completely False          MT= Mainly True
MF= Mainly False           CT = Completely True
Un= Uncertain

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

1. I found the experience of labor and delivery to be one of the most unpleasant experiences I've ever had.

2. I think that I will be a good mother.

3. I am confident that I will have a close and warm relationship with my baby.

4. I don't have much confidence in my ability to help my baby learn new things.

5. Looking forward to having a baby gave me more pleasure than actually having one.

6. I have real doubts about whether my baby will develop normally.

7. I found the delivery experience frightening and very unpleasant.

8. I often worry that I may be forgetful and cause something bad to happen to my baby.

9. I am confident that I will be able to work out any normal problems I might have with my baby.

10. I am concerned that I may have trouble figuring out what my baby needs.

11. I worry about whether my baby will like me.

12. I expect that I won't mind staying at home to care for my baby.

13. I found the delivery experience to be very exciting.

14. I am concerned about whether my baby will develop normally.

15. I doubt that my baby could love me the way I am.

16. It really makes me feel depressed to think about all there is to do as a mother.

17. I worry that I will not know what to do if my baby gets sick.

18. It is difficult to know what my baby wants.

19. I found the whole experience of labor and delivery to be one of the best experiences of my life.

20. I am afraid that I will be awkward and clumsy when handling my baby.

21. I feel confident about being able to teach my baby new things.

22. I am confident that my baby will be strong and healthy.

23. I feel that I will do a good job taking care of my baby.

24. I know enough to be able to teach my baby many things that he/she will have to learn.

25. I worry about being able to fulfill my baby's emotional needs.

26. I am confident that my baby will love me very much.

Involvement Data

Source and degree of support from the baby's father and grandmother:

Is the baby's father involved with the baby in any way?     Yes \_\_\_\_     No \_\_\_\_

If you answered yes to the previous question, what is the degree of involvement:

\_\_\_\_     sees the baby at least once a week for less than an hour
\_\_\_\_     sees the baby at least once a week for greater than one hour
\_\_\_\_     sees the baby twice a week for more than an hour each time
\_\_\_\_     sees the baby more than 3 times a week for less than an hour each time
\_\_\_\_     sees the baby more than 3 times a week for more than an hour each time
\_\_\_\_     cares for the baby on a daily basis (eg. holds, feeds, or baths)
\_\_\_\_     provides money to help you care for the baby (eg. diapers, formula)
\_\_\_\_     babysits for you

Is the baby's grandmother involved with the baby in any way?     Yes \_\_\_\_ No \_\_\_\_

If you answered yes to the previous question, what is the degree of involvement:

\_\_\_\_     sees the baby at least once a week for less than an hour
\_\_\_\_     sees the baby at least once a week for greater than one hour
\_\_\_\_     sees the baby twice a week for more than an hour each time
\_\_\_\_     sees the baby more than 3 times a week for less than an hour each time
\_\_\_\_     sees the baby more than 3 times a week for more than an hour each time
\_\_\_\_     cares for the baby on a daily basis (eg. holds, feeds, or baths)
\_\_\_\_     provides money to help you care for the baby (eg. diapers, formula)
\_\_\_\_     babysits for you

# APPENDIX C: ETHICAL APPROVAL

<u>UNIVERSITY OF MANITOBA</u>

<u>FACULTY COMMITTEE ON THE USE OF HUMAN SUBJECTS IN RESEARCH</u>

NAME:  Ms. Loretta Secco                    OUR REFERENCE: E95:176

DATE: August 31, 1995

<u>YOUR PROJECT ENTITLED:</u>

Perceived Maternal Competence as an Indicator of Performed Mothering Behavior, Parenting Stress, and Infant Devlopment.

HAS BEEN APPROVED BY THE COMMITTEE AT THEIR MEETING OF:

Approved by Dr. Gordon Grahame on behalf of the Committee on August 31, 1995.
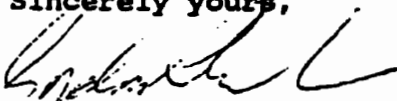
<u>COMMITTEE PROVISOS OR LIMITATIONS</u>

Revised consent form approved as per your letter dated August 21, 1995.

You may be asked at intervals for a status report. Any significant changes of the protocol should be reported to the Chairman for the Committee's consideration, in advance of implementation of such changes.

**THIS IS FOR THE ETHICS OF HUMAN USE ONLY. FOR THE LOGISTICS OF PERFORMING THE STUDY, APPROVAL SHOULD BE SOUGHT FROM THE RELEVANT INSTITUTION, IF REQUIRED.

Sincerely yours;

Gordon R. Grahame, M.D.,
Chairman,
Faculty Committee on the Use of
  Human Subjects in Research.

GRG/11

TELEPHONE INQUIRIES:
789-3255 - Lorraine Lester

# APPENDIX D: STUDY EXPLANATION AND CONSENT

Title: **Relationship of Adolescent Perceived Maternal Competence to other Maternal Characteristics**

## Research Purpose:

There has been little research on Canadian adolescent mothers and their infants. This research will tell us more about adolescent mothers and help describe factors (such as social support, self-esteem, and depression) which relate with feeling able to care for and interact with your baby.

## Procedure:

I am asking you to participate in this study because you are a pregnant adolescent living in Winnipeg and receiving prenatal care from a clinic or hospital. Participation in the study would mean commitment to one month of follow-up which would include 3 contact visits where you complete research forms. The times are: before birth, one, and 4 weeks after birth. Appointment times will be set that are convenient for you and they will take from 30 minutes to one hour of your time. Information will be gathered on how able you feel in caring for your infant, sources of support, depression, and self-esteem.

## Benefits:

Participation in this study may result in no benefit to you or your infant although some mothers may like a to ask questions.

The research will add to the scarce knowledge on characteristics of Canadian adolescent mothers.

## Risks/Discomforts:

There are no known risks or discomforts involved in participating in this study except the time commitments.

If the researcher is concerned about the infant's health and/or development, she will discuss this with you and inform the infant's health care provider and/or social worker.

# CONSENT FORM

Title: **Relationship of Adolescent Perceived Maternal Competence to other Maternal Characteristics**

Investigator:   Loretta Secco, Nurse and doctoral student

I agree that the research study and procedures written on the attached form have been explained to me and that my questions have been answered to my satisfaction.  I have been informed that participation in the study is voluntary and that, if I agree to participate, I may withdraw at any time.  I understand that participation may result in no benefits to me or my infant and the possible risks and benefits have been explained to me.   I know that I can ask questions at any time about the study procedures.   I understand that the information gathered for this study which pertains to myself and my infant will be kept confidential and that no identifying features will be made public.  I also understand that if the researcher is concerned about my infant's growth and/or development she will inform me of that concern and notify the infant's health care provider.

I understand that I may withdraw from the study at any time and that my withdrawal will not affect the usual medical care of myself and my infant.

PARTICIPANT'S NAME:          _____

PARTICIPANT'S SIGNATURE:          _____

RESEARCHER'S NAME:          _____

RESEARCHER'S SIGNATURE:          _____

Loretta Secco may be reached at: 253-5089 for questions or concerns.

**STUDY EXPLANATION \***
**Perceived Maternal Competence as an Indicator of Performed Mothering Behavior,**
**Parenting Stress, and Infant Development**

## Why is the Study Being Done?

Few studies of teenage mothers and their babies have been done in Canada. This study will help tell us what factors relate with teenage mother's feelings of being able to care for and interact with her baby. You are free to ask questions about the study now or at any time throughout the study should you decide to join.

## What Will Take Place?

You have been asked to take part in this study because you are a pregnant teenager living in Winnipeg. If you decide to join the study, you will be seen five times until your baby is one year old. The visit times are: before birth, one and 4 weeks after birth, and 10 and 12 months after birth. Visits will be set at times that are good for you and will take from 20 minutes to one and one-half hours of your time. The researcher would like to know how able you feel in caring for your baby, sources of help, self-esteem, infant temperament, mothering in the home, and parenting stress. A home assessment will be done at 10 months where a researcher will visit you in your home, this will take about one hour of your time. Your baby's development will be assessed at 12 months at the Children's Hospital and this will likely take about one hour of your time. All the forms you complete will have code numbers rather than names so no one but the researchers will know who completed the forms and they will not be linked with your name.

## What Will I Gain From Joining This Study?

If you join the study there may be no benefit to you or your baby although some mothers enjoy the chance to ask questions and to have their baby's development assessed. Each mother who completes all the study forms, the home assessment, and has her baby's development assessed at 12 months will receive $25.00 to help with travel costs resulting from joining the study.

## Are There Any Risks To Joining The Study?

If you join the study there are no risks to you other than giving up your time for the research visits.

If at any time the researcher becomes worried about the baby's health and/or growth, she will talk to you and then (with your permission) the baby's nurse, doctor, and/or social worker.

\*      There were two study explanations and consent forms because funding was awarded for the larger longitudinal investigation after 2/3 of the adolescents were recruited into the doctoral study. When funding was received for the larger study, there was a need for a new explanation and to re-contact the participants and explain the new aspects of the study.

**Loretta Secco**
**253 - 5089**

# CONSENT FORM

**Perceived Maternal Competence as an Indicator of Performed Mothering Behavior, Parenting Stress, and Infant Development**

Investigator:   Loretta Secco, Nurse and doctoral student

I agree that the study described on the explanation sheet has been explained to me. I have been told that it is my choice to join the study and that, even if I agree to join, I may quit at any time. I know that the study may not benefit me or my baby. I know that I can ask questions at any time about the study. I know that forms completed by myself will have code numbers and that the information will not be shared with others. I also know that if the researcher becomes worried about my baby's growth and/or health she will tell me and then my baby's nurse, doctor, and/or social worker.

I have been told that I may leave this study at any time with no effect on my own or my baby's health care.

**DATE:**   _____

PARTICIPANT'S NAME:            _____

PARTICIPANT'S SIGNATURE:      _____

GUARDIAN'S NAME                _____

GUARDIAN'S SIGNATURE           _____

RESEARCHER'S NAME:             _____

RESEARCHER'S SIGNATURE:        _____

Loretta Secco may be reached at: 253-5089 for questions or concerns.

# APPENDIX E: DEMOGRAPHIC DATA SHEETS

## Mother of Baby:

Age: _____

Due Date: _____

Date of Birth: _____

Racial background:
    Black ____             Asian ____
    Native Indian _____    Caucasian _____
    Other: please specify: _____

Do you have other children at home:    Yes _____    No_____

If you have other children, please list their birth dates:

_____

List the highest grade you completed in school: _____

Are you currently attending school: _____
Which School: _____

Are you:
          single   ____
          married  ____
          divorced ____
          common law ____
          other    (please specify): _____

List your main source of money: _____

You live in whose home/apartment:

    ____ my own
    ____ my boyfriend's or husband's
    ____ my parent's
    ____ other (please specify): _____

Do you smoke cigarettes? ____ yes _____ No

If you do smoke, approximately how many cigarettes do you smoke per day? _____

Your Mother's occupation: _____

## Your Father's occupation: _____

Circle the highest level of school or college that your mother and father completed:

**MOTHER:**    1. 1-8th grade
2. 9-12th grade
3. Vocational or some college
4. College graduate
5. Graduate or professional school

**FATHER:**    1. 1-8th grade
2. 9-12th grade
3. Vocational or some college
4. College graduate
5. Graduate or professional school

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

<u>Father of Baby</u>:

Date of Birth: _____ or Age: (if birthday unknown) _____

Racial background:

Black ____          Asian ____
Native Indian _____     Caucasian _____
Other: please specify: _____

Highest grade completed in school: _____

Is the father of the baby employed: YES _____     NO _____

Occupation: _____

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

<u>Baby</u>:

Date of Birth: _____     Sex:    boy ____
girl ____

birth weight: _____                  height _____

health:  good _____
other _____

Feeding: Breast: _____

Bottle: _____

In case of difficulty reaching you for this study, could you write down the names and addresses of a family member and a friend whom I could call or contact to help me reach you:

**FRIEND'S NAME:** _____

       address: _____
                  _____

    phone number: _____


**FAMILY MEMBER'S**
**NAME:** _____

       address: _____

         phone: _____

**Participant's**   **Phone:** _____

          **Address:** _____

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